



## REPORT

# Chalkdock Marsh Technical Report

Client: Chichester Harbour Conservancy

Reference: PC8331-HAS-XX-XX-RP-X-0001

Status: Final/C01

Date: 20 April 2026



**HASKONING UK LTD.**

Telecom House  
125-135 Preston Road  
Brighton  
BN1 6AF  
United Kingdom  
Water & Maritime  
VAT registration number: 792428892

Phone: +44 (0)1444 458551  
Email: [info@uk.haskoning.com](mailto:info@uk.haskoning.com)  
Website: [haskoning.com](http://haskoning.com)

Document title:	Chalkdock Marsh Technical Report
Subtitle:	
Reference:	PC8331-HAS-XX-XX-RP-X-0001
Your reference	
Status:	Final/C01
Date:	20 April 2026
Project name:	Chalkdock Marsh
Project number:	PC8331
Author(s):	Lexi Dart
Drafted by:	Lexi Dart
Checked by:	Claire Mellett
Date:	31/03/26
Approved by:	Tom Green
Date:	20/04/26
Classification:	Open

*Unless otherwise agreed with the Client, no part of this document may be reproduced or made public or used for any purpose other than that for which the document was produced. Haskoning UK Ltd. accepts no responsibility or liability whatsoever for this document other than towards the Client.*

*Please note: this document contains personal data of employees of Haskoning UK Ltd.. Before publication or any other way of disclosing, this report needs to be anonymized, unless anonymisation of this document is prohibited by legislation. This document may have been prepared with the assistance of artificial intelligence (AI); all AI-generated content has been reviewed and validated by our experts.*

## Table of Contents

<b>1</b>	<b>Introduction</b>	<b>3</b>
1.1	Project Location	3
1.2	Project Background and Context	4
1.3	Scope of Study	6
1.4	Structure of Report	7
<b>2</b>	<b>Site Walkover</b>	<b>7</b>
<b>3</b>	<b>Site Characteristics and Baseline Studies</b>	<b>13</b>
3.1	Flood and Coastal Erosion Risk Management Context	13
3.1.1	Shoreline Management Plan	13
3.1.2	Chichester Harbour Management Plan 2025-2030	13
3.2	Coastal Setting	14
3.2.1	Tidal Levels and Tidal Range	15
3.2.2	Existing Ground Levels	17
3.3	Landscape Characteristics	19
3.3.1	Existing Land Use and Habitats	19
3.3.2	Habitat Change	21
3.3.3	Existing Assets	23
3.3.3.1	Concrete Sleepers	23
3.3.3.2	Outfall Pipe	26
3.3.3.3	Benches	27
3.4	Coastal Flood and Erosion Risk	28
3.4.1	National Flood and Coastal Erosion Risk Management Strategy (FCERM)	28
3.4.2	Coastal Flood Risk	29
3.4.2.1	Flood Risk along the Footpath	30
3.4.3	Coastal Erosion Risk	37
3.4.4	Coastal Erosion and Flood Risk	38
<b>4</b>	<b>Habitat Creation</b>	<b>41</b>
4.1	Historical Saltmarsh Opportunity Assessment	41
4.2	Saltmarsh at Risk	44
4.3	Saltmarsh Habitat Opportunities	47
<b>5</b>	<b>Legal and Policy Implications</b>	<b>49</b>
5.1	Biodiversity Net Gain (BNG)	50
<b>6</b>	<b>Potential Design Options</b>	<b>51</b>
6.1	Option 0 – ‘do nothing approach’	51

6.1.1	Current Footpath Maintenance	53
6.2	Option 1	55
6.3	Option 2	57
6.3.1	Option 2A	58
6.3.2	Option 2B	60
6.4	Option 3	63
6.5	Option 4	65
6.6	Option 5	67
<b>7</b>	<b>Recommended Option</b>	<b>69</b>
7.1	Re-use of Concrete Sleepers	71
<b>8</b>	<b>References</b>	<b>72</b>
8.1	Data Sources	73

## Table of Tables

Table 3.1:	Present day predicted astronomical tidal levels for the project location (United Kingdom Hydrographic Office, 2025).	15
Table 3.2:	Changes to tide levels at Itchenor over time due to sea level rise (RCP 8.5 70th percentile).	16
Table 3.3:	Predicted extreme water levels within Chichester Harbour (output point 4604_3) – (UKCP18 RCP8.5 70th percentile).	17
Table 3.4:	Advantages and disadvantages of removing concrete sleepers.	26
Table 4.1:	Coastal habitat types and the water levels in which they will establish.	41
Table 4.2:	Opportunities for habitat creation as water levels rise.	47
Table 5.1:	Relevant considerations and policy requirements from the Chichester Local Plan: Key Policies 2021-2039.	49
Table 6.1:	Option 0 advantages, disadvantages, constraints and uncertainties relating to technical, environmental and social factors.	52
Table 6.2:	Option 1 advantages, disadvantages, constraints and uncertainties relating to technical, environmental and social factors.	56
Table 6.3	Option 2 advantages, disadvantages, constraints and uncertainties relating to technical, environmental and social factors.	58
Table 6.4:	Option 2A advantages, disadvantages, constraints and uncertainties relating to technical, environmental and social factors.	60
Table 6.5:	Option 2B advantages, disadvantages, constraints and uncertainties relating to technical, environmental and social factors; the field numbers are shown in Figure 6.8.	62
Table 6.6:	Option 3 advantages, disadvantages, constraints and uncertainties relating to technical, environmental and social factors.	64

Table 6.7: Option 4 advantages, disadvantages, constraints and uncertainties relating to technical, environmental and social factors.	66
Table 6.8: Option 5 advantages, disadvantages, constraints and uncertainties relating to technical, environmental and social factors.	68
Table 7.1: Options for re-using concrete sleepers.	72

## Table of Figures

Figure 1.1. Location of section (WEI-1) of the King Charles III footpath and surrounding area.	3
Figure 1.2. Project location and the surrounding area with the Land Registry Parcels.	4
Figure 2.1. Footpath condition, with photos from A to F showing the conditions from the east to west of section WEI-1.	8
Figure 2.2. Channel locations in study area that enable flow from Chichester Channel to Chalkdock Marsh.	9
Figure 2.3. Channel A from Figure 2.2 that links Chichester Channel to Chalkdock Marsh.	9
Figure 2.4. Channel B from Figure 2.2 that enables flow from Chichester Channel to Chalkdock Marsh.	10
Figure 2.5. Erosion and scour present along the footpath.	10
Figure 2.6. Ditches present in the fields behind the saltmarsh and woodland; photos from the second site visit.	11
Figure 2.7. Flooding in the fields landward of the saltmarsh and woodland photographed in February on the second site visit.	11
Figure 2.8. Photos showing the field margin that creates a natural path in the fields and the route which was walked on the second site visit.	12
Figure 3.1. Beneficial Use of Dredge Sediment (BuDS) site in relation to the study area.	15
Figure 3.2. Location of output points from the Environment Agency Coastal Flood Boundary datasets.	17
Figure 3.3. Existing ground levels surrounding the project location.	18
Figure 3.4. Transect showing elevations of the footpath from west to east, using an optimised approach to find the smallest elevation change between points to determine the path elevation.	19
Figure 3.5. Existing land use and habitat types for the study area; the numbered items correspond to numbered images of ditches in Figure 2.6.	20
Figure 3.6. Saltmarsh zonation classes for the study area using aerial imagery from 2016 to 2019.	21
Figure 3.7. Saltmarsh habitat change from 2008 to 2016 for the study area; the cream areas show no change, green shows gain and orange shows loss of saltmarsh habitat. The black outlines show zones which were identified as 'Not Saltmarsh' from a habitat zonation map produced in 2025 using the 2016 saltmarsh extent.	22
Figure 3.8. SSSI unit locations within the study area.	23

Figure 3.9. Section of protected frontage with concrete blocks.	24
Figure 3.10. Map showing the location of flood defences classified by the Environment Agency locally to the project area.	24
Figure 3.11. Eastern end of the protected frontage with seaweed present at the toe of the structure.	25
Figure 3.12. Concrete sleepers along the footpath experiencing erosion on the landward side of the sleeper.	25
Figure 3.13. Hard structure along the footpath enabling the marsh landward of the footpath to be inundated at high tide.	27
Figure 3.14. Bench locations and images along the footpath.	28
Figure 3.15. Present Day (2023) 1 in 30-year flood extent and depth - undefended scenario.	29
Figure 3.16. Present Day (2023) 1 in 200-year flood extent and depth - undefended scenario.	30
Figure 3.17. Elevation along footpath with the extreme water level events, MHWS and HAT for present day (2025) plotted.	31
Figure 3.18. Elevation along footpath with the extreme water level events, MHWS and HAT for 2050 plotted.	31
Figure 3.19. Elevation along footpath with the extreme water level events for 2075 and the estimated MHWS and HAT plotted.	32
Figure 3.20. Elevation along footpath with the extreme water level events for 2100 and the estimated MHWS and HAT plotted.	32
Figure 3.21.: Section lines showing where profiles of the footpath were extracted to understand how present day and future water levels will impact the footpath.	33
Figure 3.22. S_4 elevation profile with present day (2025) water levels plotted demonstrating how the footpath could be impacted.	34
Figure 3.23. S_7 elevation profile with present day (2025) water levels plotted demonstrating how the footpath could be impacted.	34
Figure 3.24. S_11 elevation profile with present day (2025) water levels plotted demonstrating how the footpath could be impacted.	35
Figure 3.25. S_6 elevation profile with estimated water levels for 2075 plotted showing how the footpath may be impacted.	36
Figure 3.26. S_8 elevation profile with estimated water levels for 2075 plotted showing how the footpath may be impacted.	36
Figure 3.27. S_10 elevation profile with estimated water levels for 2075 plotted showing how the footpath may be impacted.	37
Figure 3.28. NCERM2 No Future Intervention scenario 70th Percentile erosion for 2030 to 2080.	38
Figure 3.29. Coastal erosion and flood risk for 2025.	39
Figure 3.30. Coastal erosion and flood risk for 2050.	39
Figure 3.31. Coastal erosion and flood risk for 2075.	40
Figure 3.32. Coastal erosion and flood risk for 2100.	40

Figure 4.1. Approximate relationship between habitat and tidal datums.	41
Figure 4.2. Saltmarsh and mudflat 'existing' and 'potential' habitat from the Dynamic Solent Project for 2025 with 0mm sediment accumulation compared to the saltmarsh extent for 2019.	42
Figure 4.3. Saltmarsh and mudflat 'existing' and 'potential' habitat from the Dynamic Solent Project for 2055 with 0mm sediment accumulation.	43
Figure 4.4. Saltmarsh and mudflat 'existing' and 'potential' habitat from the Dynamic Solent Project for 2105 with 0mm sediment accumulation.	44
Figure 4.5. Saltmarsh habitat elevation relative to water levels for present day (2023).	45
Figure 4.6. Saltmarsh habitat elevation relative to estimated water levels in 2050.	45
Figure 4.7. Saltmarsh habitat elevation relative to estimated water levels in 2075.	46
Figure 4.8. Saltmarsh habitat elevation relative to estimated water levels in 2100.	46
Figure 4.9. Opportunities for saltmarsh habitat development by 2050.	47
Figure 4.10. Opportunities for saltmarsh habitat development by 2075.	48
Figure 4.11. Opportunities for saltmarsh habitat development by 2100.	48
Figure 6.1. Footpath options.	51
Figure 6.2. Footpath Option 0 route on aerial map and elevation relative to tidal and flood elevations.	53
Figure 6.3. Example illustration of repairs that would need to occur along a section of footpath to maintain it in the short-term.	54
Figure 6.4. Footpath Option 1 route on aerial map and the potential elevation building to the flood elevation for a 1-1 year storm for 2100.	55
Figure 6.5. Typical section for Option 1.	56
Figure 6.6. Footpath Option 2 route on aerial map and elevation relative to tidal and flood elevations.	57
Figure 6.7. Footpath Option 2A route on aerial map and elevation relative to tidal and flood elevations; the blue circle highlights a low area in field 2 that floods in the winter.	59
Figure 6.8. Footpath Option 2B route on aerial map and elevation relative to tidal and flood elevations; the blue circle on the aerial image highlights an area in field 2 of lower elevation that floods in the winter.	61
Figure 6.9. Footpath Option 3 route on aerial map and elevation relative to tidal and flood elevations.	63
Figure 6.10. Footpath Option 4 route on aerial map and elevation relative to tidal and flood elevations.	65
Figure 6.11. Footpath Option 5 route on aerial map and elevation relative to tidal and flood elevations.	67
Figure 7.1. Footpath route for options 2, 2A and 2B with vistas identified on the map with photos and locations for illustrations shown below.	69
Figure 7.2. Illustration of footpath generated using AI; the view is from location 1 shown in Figure 7.1.	70

Figure 7.3. Illustration of footpath generated using AI; the view is from location 2 shown in Figure 7.1. 70

Figure 7.4. Illustration of footpath generated using AI; the view is from location 3 shown in Figure 7.1. 71

Figure 7.5. Illustration of footpath generated using AI; the view is from location 4 shown in Figure 7.1. 71

## Appendices

### Appendix

A1	Additional Elevation Sections of the Footpath
A1.1	2025
A1.2	2050
A1.3	2075
A1.4	2100

### Acronyms

HAT	Highest Astronomical Tide
MHWN	Mean High Water Neap
MHWS	Mean High Water Spring
MLWN	Mean Low Water Neap
MLWS	Mean Low Water Spring
MSL	Mean Sea Level
NCERM	National Coastal Erosion Risk Mapping
NFI	No Future Intervention
OD	Ordnance Datum
SLR	Sea Level Rise
SMP	Shoreline Management Plan

## Executive Summary

Haskoning was commissioned by Chichester Harbour Conservancy to assess options for a new sustainable future route for Footpath WEI-1, part of the King Charles III England Coast Path, at Chalkdock Marsh, West Itchenor. The study responds to increasing coastal flood risk, erosion, and sea level rise (SLR), while also seeking to maximise opportunities for saltmarsh restoration and nature recovery within Chichester Harbour.

The existing footpath is currently passable for much of the year, but it is increasingly overtopped during high tides and storm events, leading to temporary closures, erosion, and safety concerns. Analysis of sea level rise projections indicates that the frequency and extent of overtopping will increase significantly over the coming years, with Mean High Water Spring events alone inundating large sections of the path by the latter half of the century.

The footpath sits at a relatively low elevation (approximately +2.5 mOD to +3.0 mOD) and forms a fixed boundary that prevents landward migration of saltmarsh, contributing to ongoing habitat loss through coastal squeeze. Local saltmarsh units are currently classified as *unfavourable declining*, and the site forms part of a wider harbour-scale nature recovery priority.

Given sea level rise and climate change impacts, holding the line is unsustainable. Furthermore the absence of properties at flood risk in this location, the ecological sensitivity of the area, and Natural England's position on defences, means that new hard defences are unlikely to be approved.

This study reviewed options for creating a new footpath and highlights the most sustainable solution, however it notes that minor interim management of the existing footpath may be achievable in the short term to prolong the life of the existing footpath.

This adaptive approach:

- Safeguards public access and footpath coherence in the long term.
- Enables natural coastal processes to operate and renaturalise the coastline
- Reduces recreational pressure on sensitive intertidal habitats.
- Supports statutory duties relating to SSSI condition, Biodiversity Net Gain (BNG) and nature recovery and resilience, allowing space for saltmarsh habitat restoration and creation.
- Aligns with the findings from the North Solent SMP Refresh and the Chichester Harbour Management Plan (2025–2030).

Five broad route options were developed and assessed at high-level against technical, environmental, social, and economic criteria:

- Option 0 (Do Nothing): baseline option in which to assess alternatives against, with the loss of access at all states of the tide likely by 2075.
- Option 1 (Raise Existing Path): Technically complex, environmentally harmful, high cost, and unlikely to secure regulatory consent.
- Options 2, 2A and 2B (Landward Rollback Routes): Provide accessible alternatives behind the existing saltmarsh and woodland edge, enabling natural rollback of the shoreline.
- Options 3–5: More conservative in terms of flood risk, but with greater impacts on user experience, the woodland and accessibility.

At this stage, Option 2 is recommended as the preferred solution, with Options 2A and 2B retained as sub-options to explore. The preferred approach involves rerouting the footpath landward of the existing



saltmarsh and woodland edge, allowing the current coastal path to be gradually relinquished to natural processes. Key benefits include:

- Long-term resilience to flooding and erosion
- Fully accessible route suitable for wheelchairs, pushchairs, and buggies
- Protection of the integrity and continuity of the England Coast Path
- Reduction in trampling pressure on saltmarsh and disturbance to overwintering bird habitats
- Creation of approximately 0.5 hectares of additional saltmarsh habitat, contributing to harbour-wide nature recovery targets
- Compatibility with Natural England, Environment Agency, CHC legal obligations and local planning policy

Overall, planning now for a managed rollback at Chalkdock Marsh is a pragmatic and future-proof response to climate change. The recommended option balances public access, landscape character, and ecological protection, ensuring the King Charles III England Coast Path remains viable while contributing positively to the recovery of Chichester Harbour's intertidal habitats.

This report provides a robust evidence-base to support engagement with landowners, West Sussex County Council, Natural England and other stakeholders as the project progresses to the next stage of design and delivery.

## 1 Introduction

Haskoning was commissioned by Chichester Harbour Conservancy to assess options for a new sustainable future route for footpath WEI-1, part of the King Charles III footpath, at Chalkdock Marsh, West Itchenor, whilst also considering opportunities to re-naturalise the coastline (including the removal of the low concrete structures along the footpath) with the goal of improving saltmarsh habitat restoration and creation potential.

### 1.1 Project Location

Located at the intersection of Bosham Channel and Chichester Channel lies West Itchenor to which the footpath at Chalkdock Marsh sits to the west (Figure 1.1). As well as the footpath itself, the study area also includes Chalkdock Marsh, the Park Copse and Birch Copse Ancient Woodland and agricultural land landward of the footpath (Figure 1.1).



Figure 1.1. Location of section (WEI-1) of the King Charles III footpath and surrounding area.

The intertidal area to mean high water spring (MHWS) is owned and managed by Chichester Harbour Conservancy. The land beyond the MHWS line is privately owned with the boundaries shown in Figure 1.2.



Figure 1.2. Project location and the surrounding area with the Land Registry Parcels.

## 1.2 Project Background and Context

Chichester Harbour is located on the south coast of England and is the largest designated area within National Character Area 126, the South Coast Plain (Natural England, 2014). The following nationally and internationally important and locally designated sites overlap with Chichester Harbour, demonstrating its importance both nationally and globally for its coastal ecosystems and the services they provide:

- Chichester Harbour National Landscape
- Chichester Harbour Site of Special Scientific Interest (SSSI)
- Chichester and Langstone Harbours Special Protection Area (SPA)
- Chichester and Langstone Harbours Ramsar site
- Solent Maritime Special Area of Conservation (SAC)
- Chichester Harbour Amenity Area – designated under the 1971 Chichester Harbour Conservancy Act
- Chichester Harbour Shellfish Waters (Chichester Channel, Thornham Channel and Emsworth Channel).

In February 2021, Natural England published its Condition Review of the Chichester Harbour SSSI (NERR090) (Bardsley et al., 2021) and through a combination of desk-based evidence reviews and field surveys, they assessed the condition of the harbour's special habitats and species (known as notified features). The report noted that Chichester Harbour lost 58% of its saltmarsh habitat between 1946 to 2016 (Bardsley et al., 2021). Since the SSSI was designated in 1970, almost half (46%) of the saltmarsh present at the time has been lost (Bardsley et al., 2021). The loss has been incremental around the



harbour and will require many sites with small gains to reverse the decline and cumulatively improve the saltmarsh extent. The location at Chalkdock Marsh provides a potential opportunity to support habitat restoration and creation

Overall, the main intertidal habitat features were assessed as being in 'unfavourable declining' condition largely due to the continued loss of the extent of saltmarsh and the poor quality of saltmarsh and mudflat habitat. The Condition Review highlighted the need to remove barriers to coastal change caused by inappropriate coastal management which are resulting in saltmarsh erosion due to coastal squeeze and the interruption of sediment supply.

Saltmarshes provide a range of social, economic and environmental benefits. They are exceptional at capturing and storing carbon, making them important natural assets for mitigating climate change (UK Centre for Ecology & Hydrology, 2023). They also act as powerful coastal defences, absorbing wave energy and reducing storm impacts. While saltmarshes only cover a small portion of the Earth's surface, around 40% of all plant and animal species rely on saltmarshes and other wetlands (U.S. Fish & Wildlife Service, 2023). Furthermore, saltmarshes filter pollutants and trap sediments, helping to clean water and enhance the health of coastal ecosystems. There is also a recreational benefit to saltmarshes as they provide opportunities for activities, such as birdwatching and walking, which contribute to mental and physical wellbeing. Lastly, saltmarshes can provide economic benefits to communities and local economics.

Considering the ambitions of Defra's Environmental Improvement Plan (EIP) (Defra, 2025), any plans for restoration of the natural environment of Chichester Harbour should boost the health and resilience of plants, animals and ecosystems. The plan also outlines Defra's ambition to bring 75% of SSSIs into favourable condition by 2042 (Defra, 2025). Furthermore, the plan cites a specific target relative to saltmarsh levels; by 2043, increase saltmarsh by 15% compared to 2009 levels (Commitment 13). Additional commitments relevant to this project include;

- Commitment 11: increase England's tree canopy and woodland cover; and,
- Commitment 88: improve access that protects and enhances nature and visitor experiences

The plan supported by the Environment Act 2021, sets targets for cleaner air/water, thriving wildlife, and reduced environmental harm, using SSSIs as key indicators.

The National Character Area Profile for the South Coast Plain (including Chichester Harbour) (Natural England, 2014) also recognised the need to manage the effects of coastal change by allowing the operation of natural coastal processes and improving the sustainability of current management practices along the coastline to successfully integrate the needs of the natural environment, landscape, local communities, agriculture, tourism, and recreation.

Large sections of the footpath are already impacted by MHWS making the path inaccessible at times. Furthermore, due to puddles or muddy sections parts of the path have parallel routes impacting the growth and transitioning of saltmarsh into areas of higher elevation. The current footpath is not sustainable in its current position without intervention, and there is the need to consider both the short and long term access of the footpath.

The study was commissioned to look at footpath options along the section of coastline at Chalkdock Marsh. In light of sea level rise (SLR) and the progressive erosion and flooding of the coastal path the study looks at maintaining safe access, whilst exploring the potential to support the restoration of saltmarsh habitat through the re-naturalisation of the coastline. While maintaining long-term quality access



to the coastline is high priority, restoring the SSSI saltmarsh habitat to favourable condition is a statutory requirement.

### 1.3 Scope of Study

As outlined in the Invitation to Quote for the preparation of a Technical Report relating to land at Chalkdock Marsh, West Itchenor, the scope of this study is to:

- Assess options for re-naturalising the coastline at Chalkdock Marsh in response to SLR, progressive erosion and flooding of footpath WEI-1, while maintaining safe public access for the next 75 years.
- Enable natural coastal processes to maximise saltmarsh restoration and creation potential and improve habitat resilience by establishing connectivity between existing foreshore saltmarsh, the West Itchenor BuDS trial site, and Chalkdock Marsh.
- Evaluate options for the future of footpath WEI-1, part of the King Charles III England Coast Path, including rollback strategies to reduce trampling pressure on saltmarsh habitat.
- Prepare a Technical Report to inform discussions with the landowner, West Sussex County Council (Highways Authority), and other stakeholders, guiding the next development phase and recommending a preferred course of action.

This report covers the following specific items:

- Outcomes of a site walkover to assess the current condition and accessibility of footpath WEI-1, adjacent saltmarsh, and potential impacts of high tide surges and SLR.
- A review of topography, flood risk and erosion projections for the surrounding area.
- Identification and evaluation (high-level appraisal) of options for the footpath, summarising advantages, disadvantages, constraints and uncertainties.
- Consideration of the feasibility and implications of removing old concrete low-lying structures, including advantages and disadvantages.
- For the preferred option, provision of:
  - Route and construction specifications meeting King Charles III England Coast Path standards;
  - Accessibility considerations for wheelchairs, push chairs and buggies, and potential extension of accessible paths; and,
  - Estimated implementation costs.

During the preparation of the report, a meeting was undertaken separately with the landowner, West Itchenor Parish Council, and the Itchenor Society, to discuss the options identified and include feedback into this report. Haskoning would like to thank these parties for their positive engagement with the project.

Included within the scope is a requirement to address the following key questions:

- How can the rollback of footpath WEI-1 be achieved to maintain safe access while reducing trampling pressure on saltmarsh habitat?
- What measures will maximise saltmarsh creation and resilience, and how can connectivity between existing habitats be established?
- What are the implications of removing existing concrete low-lying structures, and how will this affect coastal processes and flood risk?
- What is the most cost-effective and sustainable option for maintaining long-term public access while supporting nature recovery objectives and recovery of the SSSI?



## 1.4 Structure of Report

The report has been structured in the following way to provide a logical response to Chichester Harbour Conservancy's scope.

- Section 1: Introduction
- Section 2: Site Walkover
- Section 3: Site Characteristics and Baseline Studies
- Section 4: Habitat Creation
- Section 5: Legal and Policy Implications
- Section 6: Potential Design Options
- Section 7: Recommended Option
- Section 8: References.

## 2 Site Walkover

A site walkover took place on 8<sup>th</sup> January 2026 to understand the current condition of footpath WEI-1 and the surrounding environment. The section of footpath is approximately 0.5km long, with the footpath material and accessibility varying (Figure 2.1). The footpath has sections of shingle, mud, boardwalk and compacted gravel.



Figure 2.1. Footpath condition, with photos from A to F showing the conditions from the east to west of section WEI-1.

As visible in Figure 2.1, on the day of the site visit there was ‘pooling’ of water along the footpath due to rainfall and the uneven surface. Due to this there were some sections of the path that were muddy and wet making traversing the footpath challenging.

At two points along the footpath there are channels that flow from the Chichester Channel into Chalkdock Marsh; these locations are shown in Figure 2.2. Section A is a channel that has naturally formed over time due to surface run off and general erosion / scour (Figure 2.3) and Section B is a man-made channel to assist with the tidal exchange into Chalkdock Marsh (Figure 2.4). Whilst the man-made channel appears to be in working order, there are notable signs of scour to the side of the structure indicating the system is under some pressure and is likely to be outflanked over time if not repaired.

Along several sections of the footpath, there were notable signs of erosion (Figure 2.5) to the footpath where it narrows in places and additional scour routes have formed between the Chichester Channel and the footpath.



Figure 2.2. Channel locations in study area that enable flow from Chichester Channel to Chalkdock Marsh.



Figure 2.3. Channel A from Figure 2.2 that links Chichester Channel to Chalkdock Marsh.



*Figure 2.4. Channel B from Figure 2.2 that enables flow from Chichester Channel to Chalkdock Marsh.*



*Figure 2.5. Erosion and scour present along the footpath.*

A further site visit was conducted on the 27<sup>th</sup> of February, 2026. During this visit Haskoning walked through the fields landward of the saltmarsh and woodland. This visit highlighted a series of ditches (Figure 2.6) as well as flooding issues in the fields (Figure 2.7). The second site visit also identified a field margin that currently exists, creating a natural route for a path; with photos of this shown in Figure 2.8.



Figure 2.6. Ditches present in the fields behind the saltmarsh and woodland; photos from the second site visit.



Figure 2.7. Flooding in the fields landward of the saltmarsh and woodland photographed in February on the second site visit.



Figure 2.8. Photos showing the field margin that creates a natural path in the fields and the route which was walked on the second site visit.

### 3 Site Characteristics and Baseline Studies

This section provides a high-level overview of the baseline functions and natural characteristics of the site providing the physical context for potential future management options.

The section is structured as follows:

- 3.1: Flood and Coastal Erosion Risk Management Context
- 3.2: Coastal Setting
- 3.3: Landscape Characteristics
- 3.4: Coastal Flood and Erosion Risk

#### 3.1 Flood and Coastal Erosion Risk Management Context

##### 3.1.1 Shoreline Management Plan

Shoreline Management Plans (hereby known as SMPs) help to deliver the ambitions of the National Flood and Coastal Erosion Risk Management Strategy. They set out a non-statutory planned approach to managing flood and coastal erosion risk around the coast of England to 2105. The SMP covering footpath WEI-1 is the North Solent SMP, published in 2010, which extends from Selsey Bill to Hurst Spit, often referred to as SMP13. The coastline within the SMP is further divided into nine areas, based on coastal processes and shoreline character, with the footpath sitting in ‘Area 2: Chichester Harbour’. This area has been further divided into 17 subsection units, with Footpath WEI-1 lying within ‘Unit 5a05L Ella Nore Lane to Fishbourne’<sup>1</sup>. The overall SMP management policy from present day up to 2105 is ‘Hold the Line’ (maintain / replace). It is now accepted by the Coastal Protection Authorities that this blanket approach to Chichester Harbour is unsustainable.

A ‘Refresh’ of the SMP was carried out in 2020, ensuring plans remain up to date, incorporating any new evidence and ensuring that Risk Management Authorities start planning for policy transitions (Jacobs & Royal HaskoningDHV, 2020). The environmental impacts of ‘Hold the Line’ (hereby know as ‘HTL’) policy were evaluated with a significant adverse impact on the landscape in the long term being highlighted along with mixed impact on biodiversity and water (Environment Agency, 2020). It was also highlighted that existing defences within the Policy Unit will result in the loss of intertidal habitats due to coastal squeeze (Environment Agency, 2020). Due to the HTL policy, opportunities may be being missed to restore or improve the protected sites. It was also recommended by Bardsley et al. (2021) that barriers to coastal change caused from inappropriate coastal management are removed, specifically noting saltmarsh erosion and the interruption of sediment supply as a consequence. At Chalkdock Marsh, maintaining the current line of the footpath, which is not registered as a defence, may not get approval due to the adverse impact on the SSSI.

##### 3.1.2 Chichester Harbour Management Plan 2025-2030

The Chichester Harbour Management Plan 2025-2030<sup>2</sup> outlines the partnership framework for managing the harbour’s protected landscape. It establishes a vision for a “Nature Recovery” landscape, setting policies to conserve and enhance natural beauty and historic qualities while addressing the dual crises of climate change and biodiversity loss.

<sup>1</sup> <https://environment.data.gov.uk/shoreline-planning/unit/SMP13/5A05>

<sup>2</sup> <https://www.conservancy.co.uk/wp-content/uploads/chichester-harbour-national-landscape-management-plan-2025-30-phase4-v3-web.pdf>



The vision for Chichester Harbour by 2050 is to return the natural environment back to favourable condition and to receive commitment from stakeholders to conserving and enhancing the natural beauty. The plan includes **Policy Aim 3: Leisure & Recreation**, which has one sub aim related to this project;

- 3.3 Activities; The King Charles III England Coast Path and wider Public Rights of Way network will be well-maintained with clear signage and amenities.

The plan also includes **Policy Aim 4: Conservation of Nature**, which has two sub aims relevant to this project;

- 4.1 Nature Recovery; Saltmarsh, seagrass and wildflower meadows are to be created, conserved, and enhanced, complemented by new shingle recharges, new Tern rafts, and new sites for high tide roosts. The flora and fauna that contribute to the natural beauty will be protected for its intrinsic value.
- 4.2 Climate Change; Through nature-based solutions, Chichester Harbour National Landscape will be prepared for an increase in the frequencies of stormy weather conditions, rising sea levels and warmer temperatures.

The plan also includes planning principles of which PP01 is relevant. This principle gives ‘Great Weight for a Nationally Important Landscape’. Chichester Harbour National Landscape places great importance on conserving and enhancing its natural beauty, requiring all development within or affecting it to support its special qualities, policy aims, and sensitive coastal and intertidal environments. New housing must be located within existing settlement boundaries, while any impact on trees is carefully assessed and loss should be avoided, with native species used where planting is necessary.

## 3.2 Coastal Setting

Chichester Harbour is a sheltered embayment comprising multiple estuarine channels. Chichester Channel is the east branch from the harbour entrance and extends approximately 4km from Stocker’s Lake to West Itchenor. The shoreline at Chalkdock is undefended, however there is a low-lying concrete structure that has historically strengthened the path.

The site is located adjacent to the upper Chichester Channel, featuring declining saltmarsh, mudflats and shingle ridge. A recent (2023) project trialled the Beneficial Use of Dredged Sediment (BuDS) for restoring saltmarsh habitat; the zone marked in Figure 3.1 was the site of a BuDS trial which had three main aims:

- Restore an area of saltmarsh;
- Test a new approach to depositing dredge sediment on the upper foreshore; and,
- Understand how well nutrients are absorbed by the new saltmarsh.

Progress of the trial noted the first shoots of saltmarsh plants in the summer of 2023, with further establishment of plants in 2024 (Chichester Harbour Conservancy, 2025).



Figure 3.1. Beneficial Use of Dredge Sediment (BuDS) site in relation to the study area.

### 3.2.1 Tidal Levels and Tidal Range

The Admiralty Tide Tables published by the UK Hydrographic Office state the following tidal levels for the nearest Standard Port of Chichester Harbour and the adjusted levels for Itchenor (Table 3.1). The spring and neap tidal ranges are 4.0m and 2.1m, respectively.

Table 3.1: Present day predicted astronomical tidal levels for the project location (United Kingdom Hydrographic Office, 2025).

Chichester Harbour (Entrance)							
Location	HAT	MHWS	MHWN	MSL	MLWN	MLWS	LAT
Chart Datum <sup>3</sup> (mCD)	5.3	4.9	4.0	2.91	1.9	0.9	0.2
Ordnance Datum (mODN)	2.56	2.16	1.26	0.17	-0.84	-1.84	-2.54

Itchenor							
Location	HAT	MHWS	MHWN	MSL	MLWN	MLWS	LAT
Chart Datum <sup>4</sup> (mCD)	5.2	4.8	3.8	2.91	1.7	0.6	-
Ordnance Datum (mODN)	2.46	2.06	1.06	0.17	-1.04	-2.14	-

Using the Representative Concentration Pathway (RCP) 8.5 70<sup>th</sup> percentile SLR estimates the current water levels were used to predict how tidal elevations will change over time for 2050, 2075 and 2100. Table 3.2 displays the estimated tidal elevations.

<sup>3</sup> Chart Datum at the Standard Port of Chichester Harbour is 2.74m below Ordnance Datum (Newlyn)

<sup>4</sup> Chart Datum at the Standard Port of Chichester Harbour is 2.74m below Ordnance Datum (Newlyn)

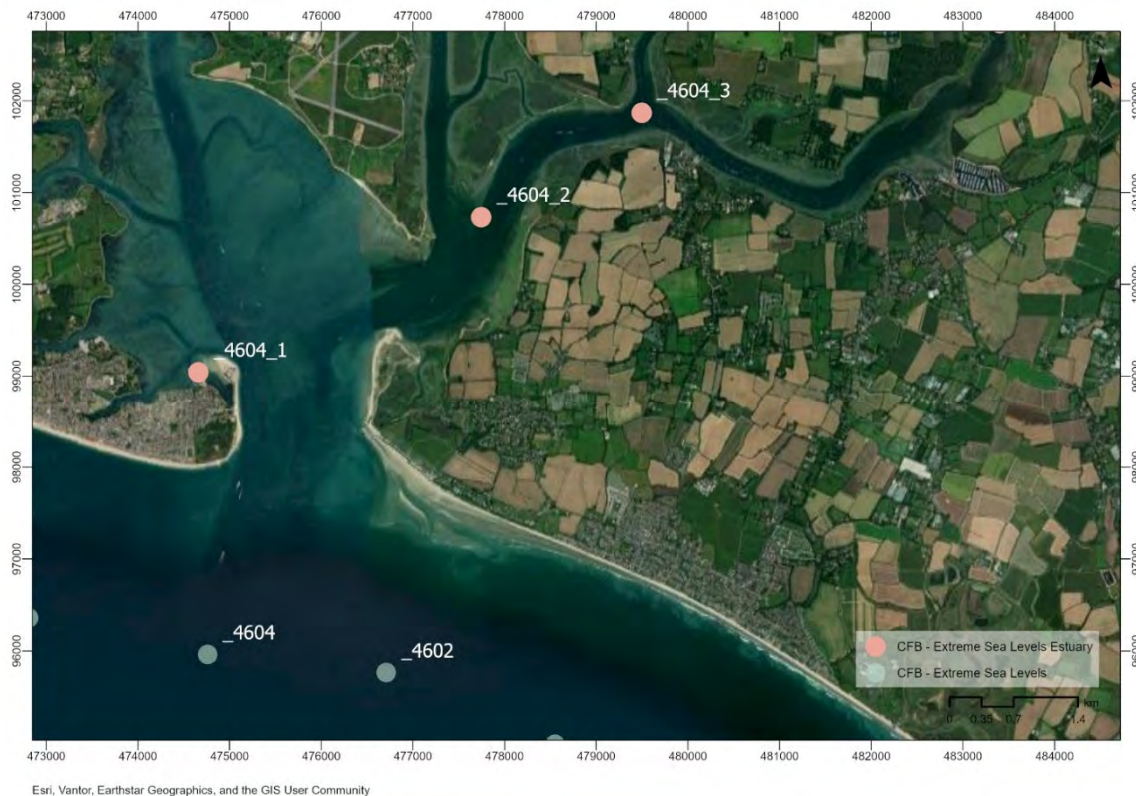
Table 3.2: Changes to tide levels at Itchenor over time due to sea level rise (RCP 8.5 70th percentile).

Tide	2025	2050	2075	2100
HAT	2.46	2.64	2.89	3.20
MHWS	2.06	2.24	2.49	2.80
MHWN	1.06	1.24	1.49	1.80
MSL	0.17	0.35	0.60	0.91
MLWN	-1.04	-0.86	-0.61	-0.3
MLWS	-2.14	-1.96	-1.71	-1.40

Baseline extreme water levels, dated 2017, are available from the Environment Agency as part of the Coastal Flood Boundary (CFB) datasets. These datasets provide extreme water levels for a range of return period events from a 1 in 1 to a 1 in 10,000-year event and have a base date of 2018. The CFB dataset utilised comes from the Estuaries and Harbour version, specifically output point 4604\_3, which is adjacent to the site, Figure 3.2.

The UK Climate Change Projections 2018 (UKCP18) provides a summary of the latest climate change projections for the UK and includes SLR projections under a variety of climate change scenarios up to 2100. In line with Environment Agency Guidance<sup>5</sup>, the baseline extreme water levels provided by the Environment Agency were 'scaled-up' using the UKCP18 SLR projections to determine predicted extreme water levels in the future. Table 3.3 provides predicted extreme water levels for 2025 and +25-year increments within Chichester Harbour.

<sup>5</sup> <https://www.gov.uk/guidance/flood-and-coastal-risk-projects-schemes-and-strategies-climate-change-allowances>



Esri, Vantor, Earthstar Geographics, and the GIS User Community

Figure 3.2. Location of output points from the Environment Agency Coastal Flood Boundary datasets.

Table 3.3: Predicted extreme water levels within Chichester Harbour (output point 4604\_3) – (UKCP18 RCP8.5 70th percentile).

SLR	Total water level (mOD)				
	2025 (present day)	2050 (+25yrs)	2075 (+50yrs)	2100 (+75yrs)	2125 (+100yr)
T1	2.91	3.09	3.34	3.65	3.98
T5	3.08	3.26	3.51	3.82	4.15
T10	3.15	3.33	3.58	3.89	4.22
T20	3.22	3.40	3.65	3.96	4.29
T50	3.31	3.49	3.74	4.05	4.38
T75	3.35	3.53	3.78	4.09	4.42
T100	3.38	3.56	3.81	4.12	4.45
T200	3.45	3.63	3.88	4.19	4.52
T500	3.55	3.73	3.98	4.29	4.62
T1000	3.62	3.80	4.05	4.36	4.69

### 3.2.2 Existing Ground Levels

Existing ground levels have been determined using LiDAR data (2021) as shown in Figure 3.3, an elevation profile along the footpath is shown in Figure 3.4 alongside water levels. The footpath sits at an approximate elevation of +2.5mOD to +3mOD. A number of sections across the footpath were also extracted and are shown in Section 3.4.2.1.



Esri, Vantor, Earthstar Geographics, and the GIS User Community

Figure 3.3. Existing ground levels surrounding the project location.

The elevation along the footpath was extracted (Figure 3.4) with the elevation ranging between 2.5m and 3.0m OD. Two channels are identified at chainages 49m and 292m, which allow tidal flow to occur within the saltmarsh landward of the footpath.

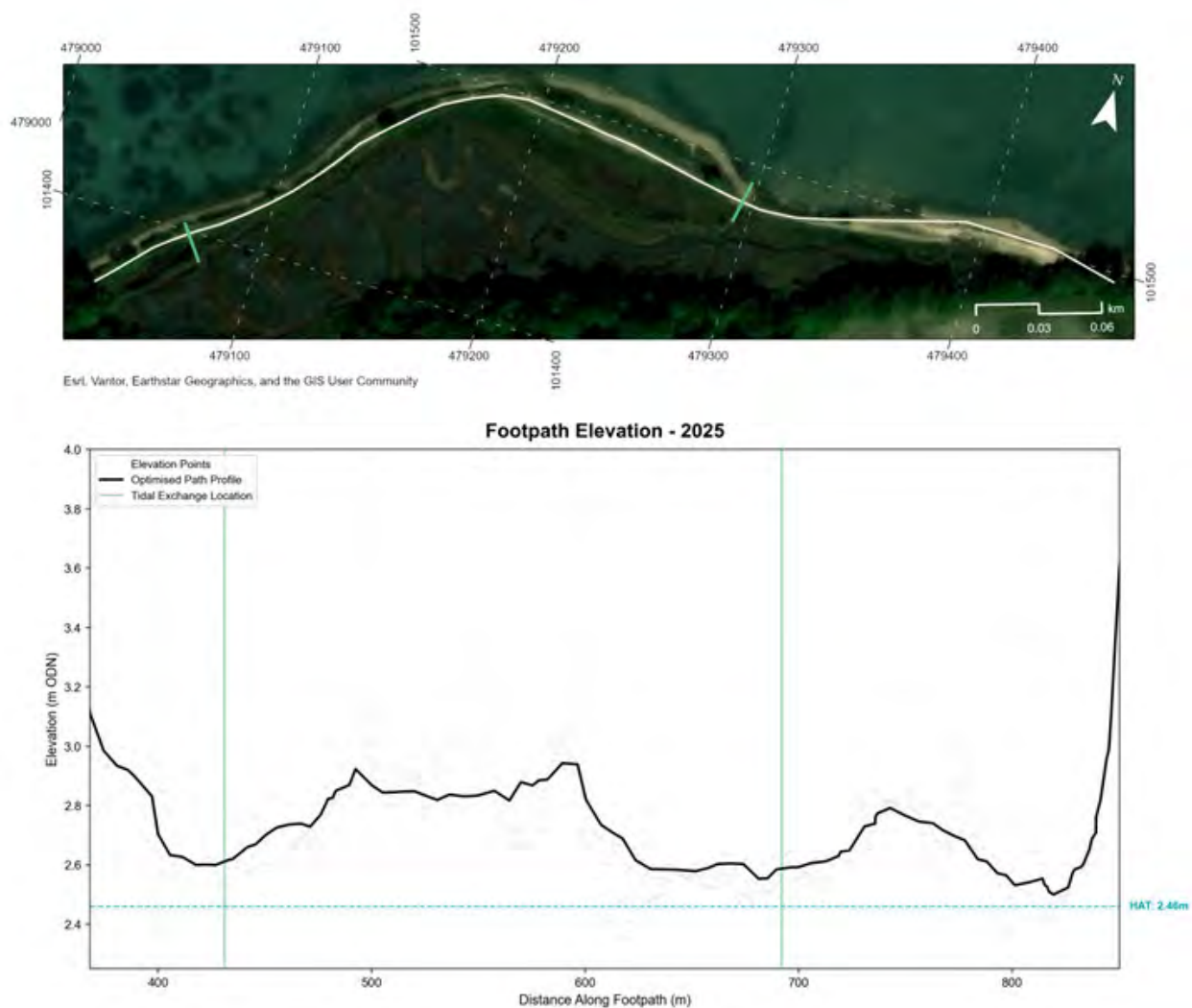


Figure 3.4. Transect showing elevations of the footpath from west to east, using an optimised approach to find the smallest elevation change between points to determine the path elevation.

### 3.3 Landscape Characteristics

#### 3.3.1 Existing Land Use and Habitats

The existing habitat zones and land use types for the study area are shown in Figure 3.5. The northern most section of the site is dominated by saltmarsh habitat, which transitions into arable and horticultural land further inland. A significant portion of the study area is designated as part of the Woodland Grant Scheme 3. The Woodland Grant Scheme provided incentives for establishing and looking after woodlands and forests. The existing footpath runs primarily along the seaward edge of the saltmarsh and woodland. Three drains are visible on the Ordnance Survey base map and shown within Figure 3.5. The second site visit conducted on the 27<sup>th</sup> of February 2026 identified several ditches; these are highlighted in Figure 3.5. Furthermore, a small pond is situated near the woodland boundary at the western end of the site.



Figure 3.5. Existing land use and habitat types for the study area; the numbered items correspond to numbered images of ditches in Figure 2.6.

Saltmarsh extent was interpreted from aerial imagery, collected between 2016 and 2019 and then mapped at the zonation level. The zonation classes for the study area are shown in Figure 3.6. Spartina, mid-low marsh and upper marsh are the dominant zonation's within the study area.

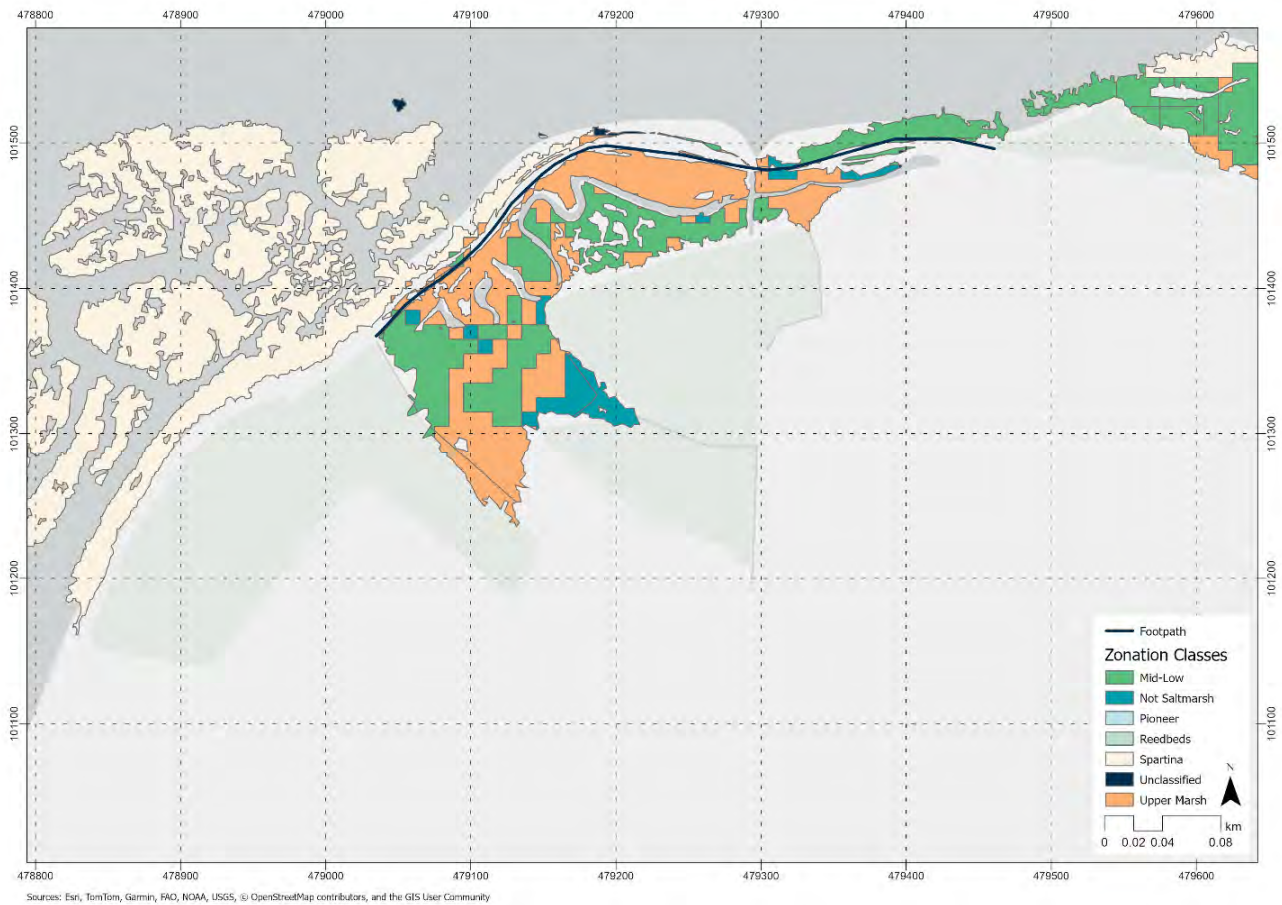


Figure 3.6. Saltmarsh zonation classes for the study area using aerial imagery from 2016 to 2019.

### 3.3.2 Habitat Change

A baseline inventory of saltmarsh extent was completed in 2006 to 2009 and the most recent inventory used imagery captured between 2016 and 2019. For the study area saltmarsh extent was determined over an 8-year period (2008 to 2016). Figure 3.7 shows how saltmarsh habitat has changed in the study area, with the cream colour representing the stable saltmarsh habitat during this period. The pale green highlights new pockets of saltmarsh growth, primarily along the internal creek edges and the landward fringe of the central marsh. The landward migration of the saltmarsh demonstrates how the saltmarsh habitat within the study area is trying to migrate as sea levels rises, stressing the importance of providing the space for this to occur. The orange areas show loss, indicating significant erosion has occurred on the seaward edge of the marsh as well as along the outer banks of the main tidal channels. The areas marked as 'Not Saltmarsh' are from a study that classified the marsh extent data from 2016 by habitat type, identifying these areas as not saltmarsh (Environment Agency, 2025b). The existing footpath is acting as a fixed boundary preventing the marsh from pushing back and limiting sedimentation processes required to sustain saltmarsh habitat. In several sections, the saltmarsh is eroding directly up to the path line. Human trampling pressures are also a concern as the saltmarsh tries to roll back into the path.

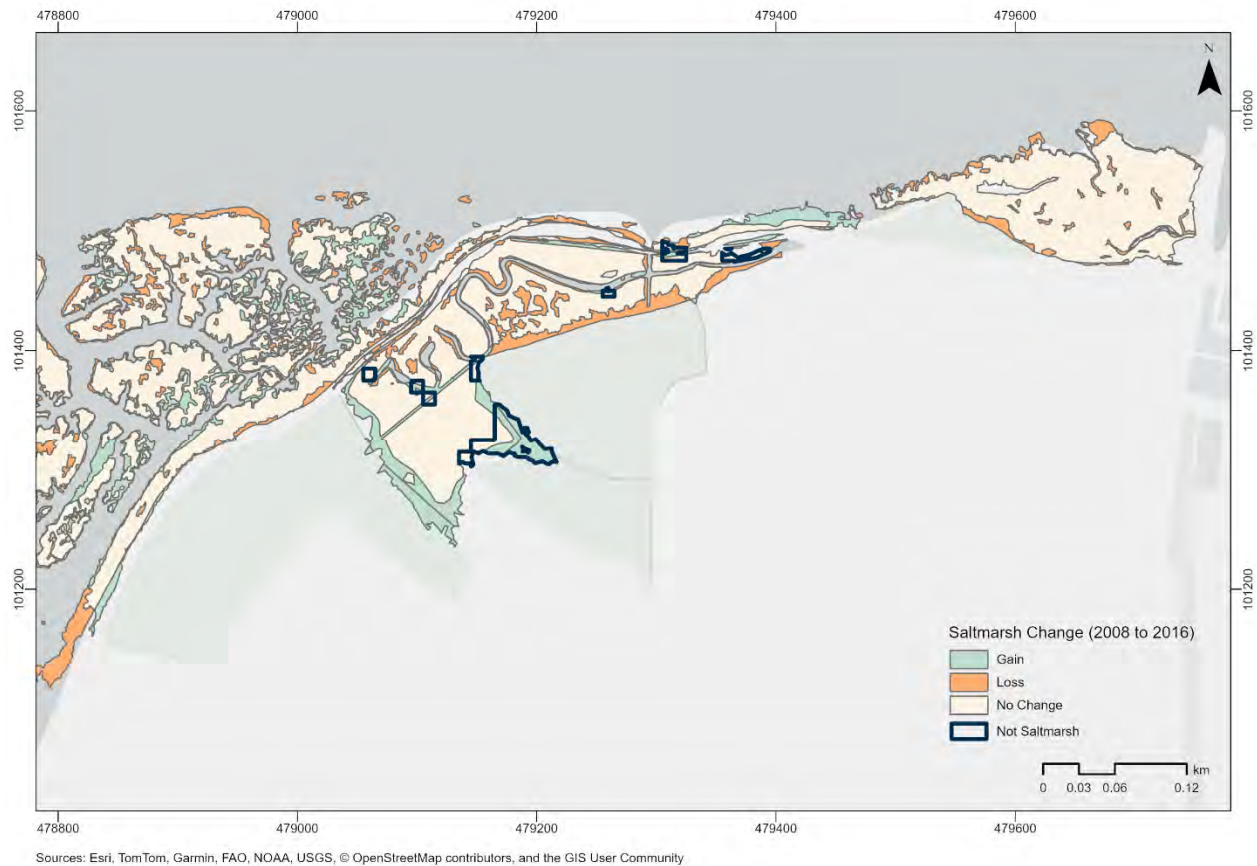


Figure 3.7. Saltmarsh habitat change from 2008 to 2016 for the study area; the cream areas show no change, green shows gain and orange shows loss of saltmarsh habitat. The black outlines show zones which were identified as 'Not Saltmarsh' from a habitat zonation map produced in 2025 using the 2016 saltmarsh extent.

Sites of Special Scientific Interest (SSSI) are reassessed periodically to record individual unit conditions. Unit divisions are based on habitat, tenure and management. Within the study area there are two SSSI units (Figure 3.8). The most recent assessment classified both units as unfavourable declining. This was due to historic and continued saltmarsh loss. Signs of coastal squeeze were noted, and effects of nutrient enrichment (macroalgae) were observed.

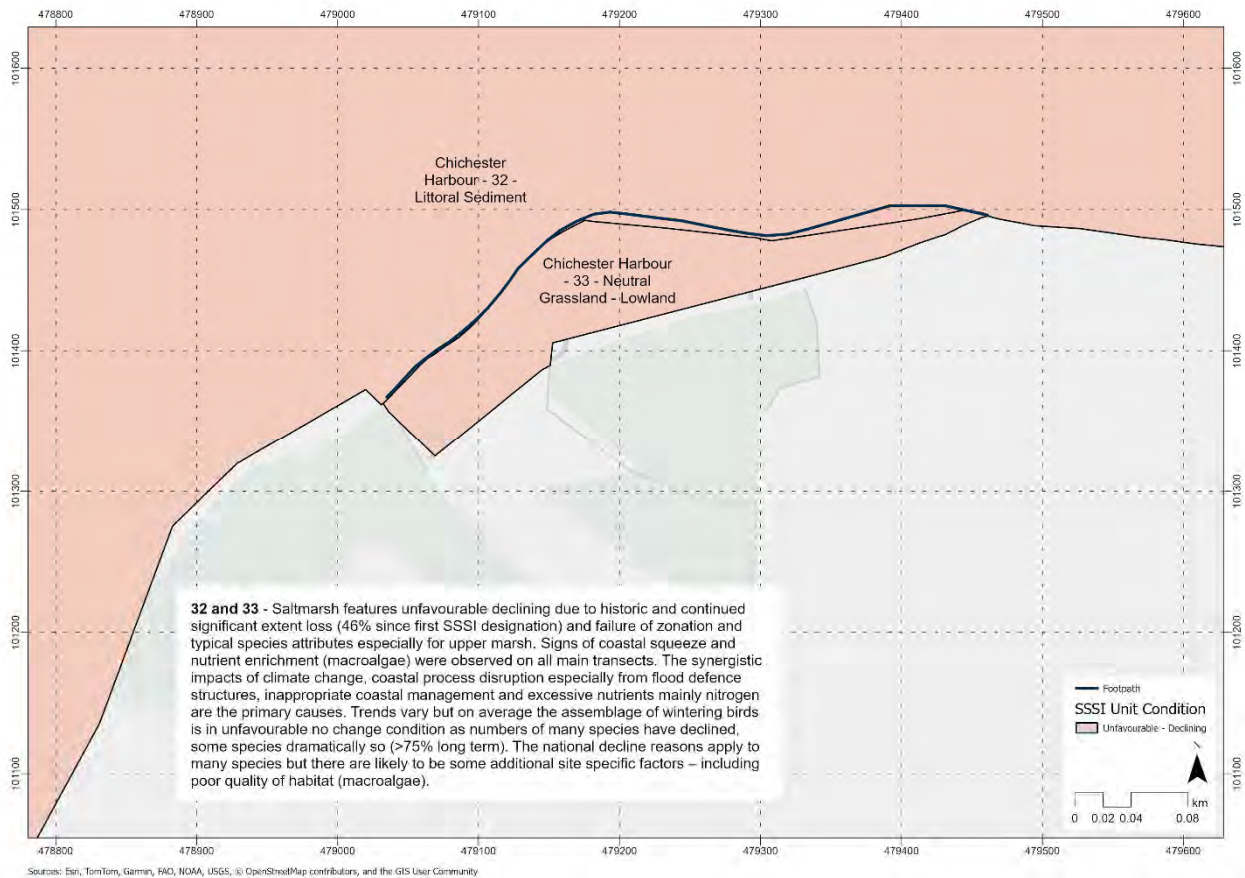


Figure 3.8. SSSI unit locations within the study area.

### 3.3.3 Existing Assets

The footpath only features a few assets; these include:

- Concrete sleepers;
- Outfall pipe; and
- Benches.

#### 3.3.3.1 Concrete Sleepers

Around the middle of the footpath is a section of approximately 35m (Figure 3.9), with low lying hard structures placed at the height of the footpath that slope/slump seaward. A study has been carried out by the University of Portsmouth analysing the concrete within these hard structures to assess contaminant levels (Ali & Dixon, 2026). This information will help inform the potential options for the re-use or disposal of the concrete. The concrete structure is not classified as a flood defence by the Environment Agency as shown in and is generally in poor condition with signs of slumping and failure. At present, these are helping to hold the position of the shoreline immediately behind.

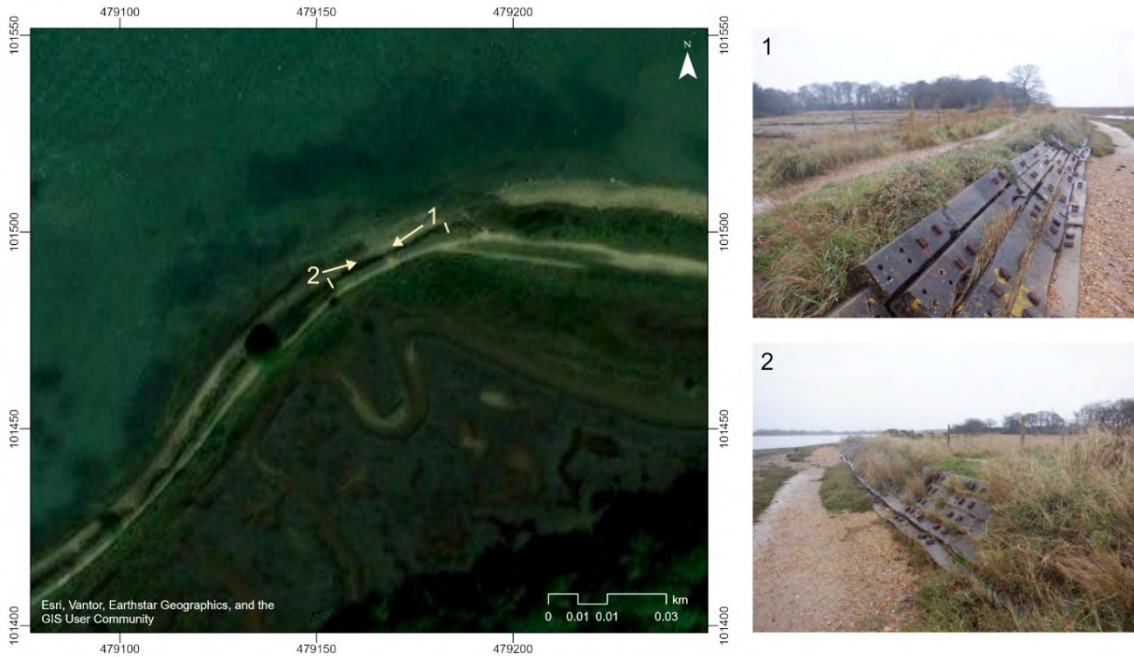


Figure 3.9. Section of protected frontage with concrete blocks.



Figure 3.10. Map showing the location of flood defences classified by the Environment Agency locally to the project area.

Figure 3.11 shows marine growth present at the toe of the structure which sits at around 2.4-2.5mOD, demonstrating that recent sea levels have reached or exceeded this elevation. The sleepers are experiencing erosion behind the structures as demonstrated in Figure 3.12.



Figure 3.11. Eastern end of the protected frontage with seaweed present at the toe of the structure.



Figure 3.12. Concrete sleepers along the footpath experiencing erosion on the landward side of the sleeper.

Whilst the structures do provide some erosion protection to the footpath, due to the condition it is likely that, if left in-situ, they will completely fail within the next 5-10 years. Currently, breaching of the low lying hard structures occurs at very high tides and the structures provide minimal protection of the footpath. The removal of the structures is likely to accelerate the erosion of the footpath if no effort is made to replant the exposed verge that will be left. If storm and tidal flooding is minimal the berm may be able to re-naturalise without assistance; the advantages and disadvantages of removing the sleepers are discussed further in Table 3.4.

Table 3.4: Advantages and disadvantages of removing concrete sleepers.

	Advantages	Disadvantages
<b>Environmental</b>	<ul style="list-style-type: none"> <li>• Reduces the pressure from coastal squeeze.</li> <li>• Re-naturalises the footpath edge, re-establishing natural coastal processes and allowing intertidal habitat to naturally transition landwards.</li> <li>• Restores hydrological connectivity between marsh and adjacent land.</li> <li>• Creates space for habitat development and colonisation.</li> <li>• Reduces opportunities for invasive species to establish in cracks/gaps.</li> <li>• Improves landscape aesthetics and natural character (if left will end up as debris on the foreshore).</li> </ul>	<ul style="list-style-type: none"> <li>• Faster erosion of the footpath during storms/high tides without a hardened edge.</li> <li>• Potential for the path to be lost earlier due to natural rollback. Noting, the sections of footpath either side of the sleepers is eroding at a faster rate now and will continue to regardless.</li> <li>• Sediment deposition on the path may increase.</li> <li>• Temporary disturbance to vegetation and soils during removal works.</li> <li>• Increase trampling of sensitive habitat if path edges become less defined.</li> </ul>
<b>Social</b>	<ul style="list-style-type: none"> <li>• Removes a slip/trip hazard for walkers, improving safety.</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of a physical boundary may lead to further widening of the path from informal traffic.</li> </ul>
<b>Economic</b>	<ul style="list-style-type: none"> <li>• Sleepers may be reused elsewhere, reducing material costs on other projects.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential need for more frequency path surface maintenance due to erosion or sedimentation if maintaining the path is desired.</li> <li>• Cost of sleeper removal.</li> </ul>

The University of Portsmouth has carried out an assessment of the concrete sleepers to determine whether any contaminants are present in the structures. The comprehensive chemical and mineralogical analysis of the concrete confirms that the material is geochemically stable and poses a negligible risk to the Chichester Harbour ecosystem. While total elemental analysis via EDXRF identified heavy metals and high chloride concentrations, the standardised BS EN 12457-2 batch leaching tests demonstrate that these species are effectively immobilised within the solid matrix. All regulated inorganic contaminants, including Arsenic, Cadmium, and Copper, remained either non-detectable or orders of magnitude below the thresholds for Inert Waste. From an environmental perspective, the sleepers represent a low-risk material suitable for secondary aggregate reuse or inert landfilling. However, the report also put forward recommendations for further additional testing prior to any decommissioning to ensure site-wide compliance.

### 3.3.3.2 Outfall Pipe

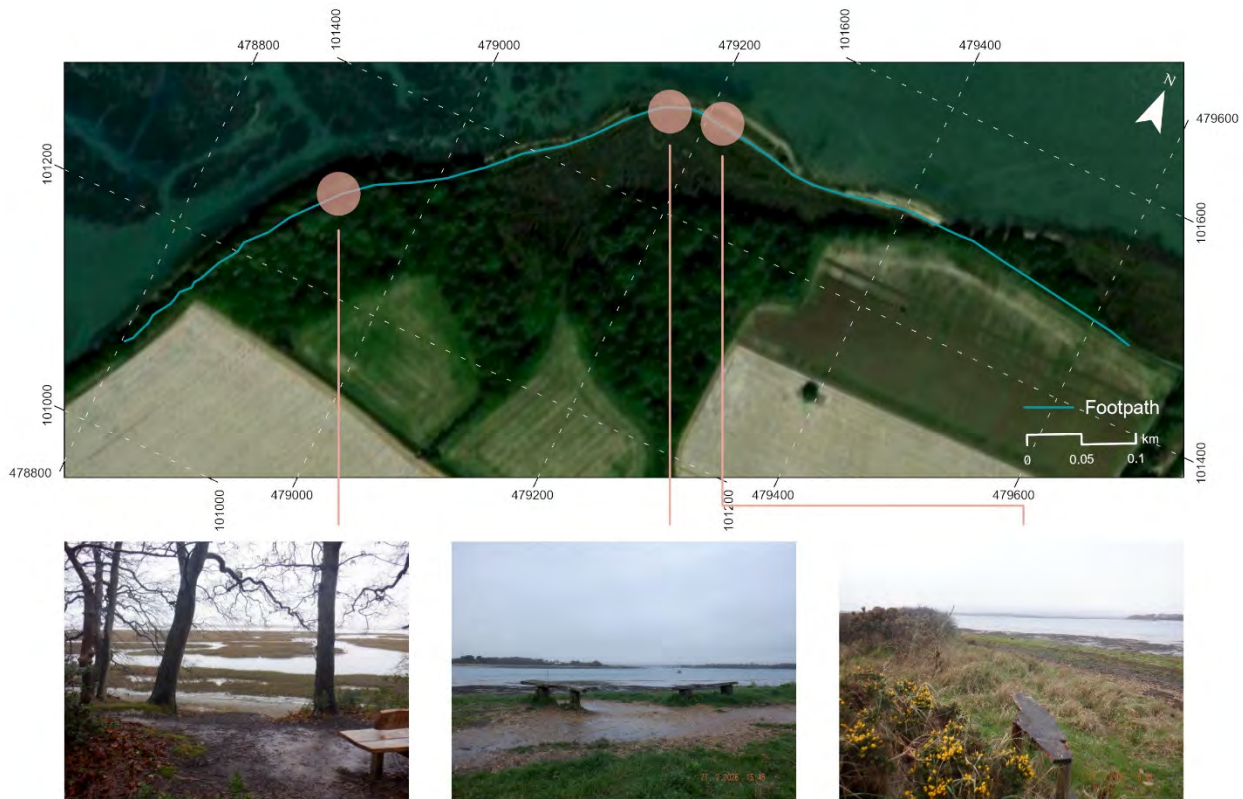
Toward the eastern end of the footpath there is an outfall (flow regulated by the pipe diameter) that runs under the footpath (Figure 3.13). Hard structures are present on both the landward and seaward side of the footpath at this location. The outfall allows for the tidal exchange between the sea and land behind the footpath.



Figure 3.13. Hard structure along the footpath enabling the marsh landward of the footpath to be inundated at high tide.

### 3.3.3.3 Benches

Along the footpath there are four benches which are in varying conditions. The benches along the exposed coastal section of the path are in poor condition, likely experiencing harsher conditions than the bench in the woods which looks relatively new and in very good condition. Figure 3.14 shows the bench locations along the footpath.



Esri, Vantor, Earthstar Geographics, and the GIS User Community

Figure 3.14. Bench locations and images along the footpath.

### 3.4 Coastal Flood and Erosion Risk

#### 3.4.1 National Flood and Coastal Erosion Risk Management Strategy (FCERM)

The Environment Agency (2020) FCERM Strategy for England up to 2100, includes using the Habitat Compensation and Restoration Programme (HCRP) as the agreed strategic mechanism for delivering the necessary compensation requirements to support the ambitions of the FCERM strategy. The new strategy places a greater emphasis on the environment and nature-based solutions/natural flood management including (of most relevance to this project, amongst others):

- Plan all flood and coastal defence projects and programmes to deliver biodiversity net gain, in line with the Government's mandate, and seek to encourage other environmental benefits.
- Use nature-based solutions and improve the environment through their investments in flood and coastal resilience.
- Encourage farmers and land managers to adopt land use and land management practices that help contribute to greater resilience to both floods and droughts.

Development of actions to reduce flood risk through managed realignment around Chichester Harbour integrated with the national strategy, which calls for a broad range of resilience actions in the face of a changing climate. Alongside flood and coastal defences, a broader range of actions for achieving climate resilient places are recommended. These include avoiding inappropriate development in the floodplain and using nature-based solutions, which would include managed realignment, to protect and enhance the environment.

### 3.4.2 Coastal Flood Risk

At the end of 2023, Chichester District Council completed a Strategic Flood Risk Assessment (SFRA). The SFRA provides flood extent and depths from wave overtopping and over washing for the following scenarios:

- 'Present day' (2023) 1 in 30-year and 1 in 200-year Defended and Undefended scenarios.
- Long term (2096 and 2121) 1 in 200-year Defended and Undefended scenarios.

Since the frontage in the study area is undefended, the defended scenarios are not shown within this report. The 'undefended scenario' for the present day (2023) 1 in 30-year and 1 in 200-year flood extent and depth are shown in Figure 3.15 and Figure 3.16.

The flood maps highlight that during a present day (2023) 1 in 30-year flood event for the undefended scenario the footpath is inundated up to 1.75mOD, with the entire footpath being within the flood extent. For the 1 in 200-year scenario the flood depth along the footpath is up to 2mOD, with the nearby saltmarsh and mudflats having greater flood depths. Under both scenarios the footpath will experience varying levels of inundation, preventing access to the adjoining sections of the King Charles III footpath.

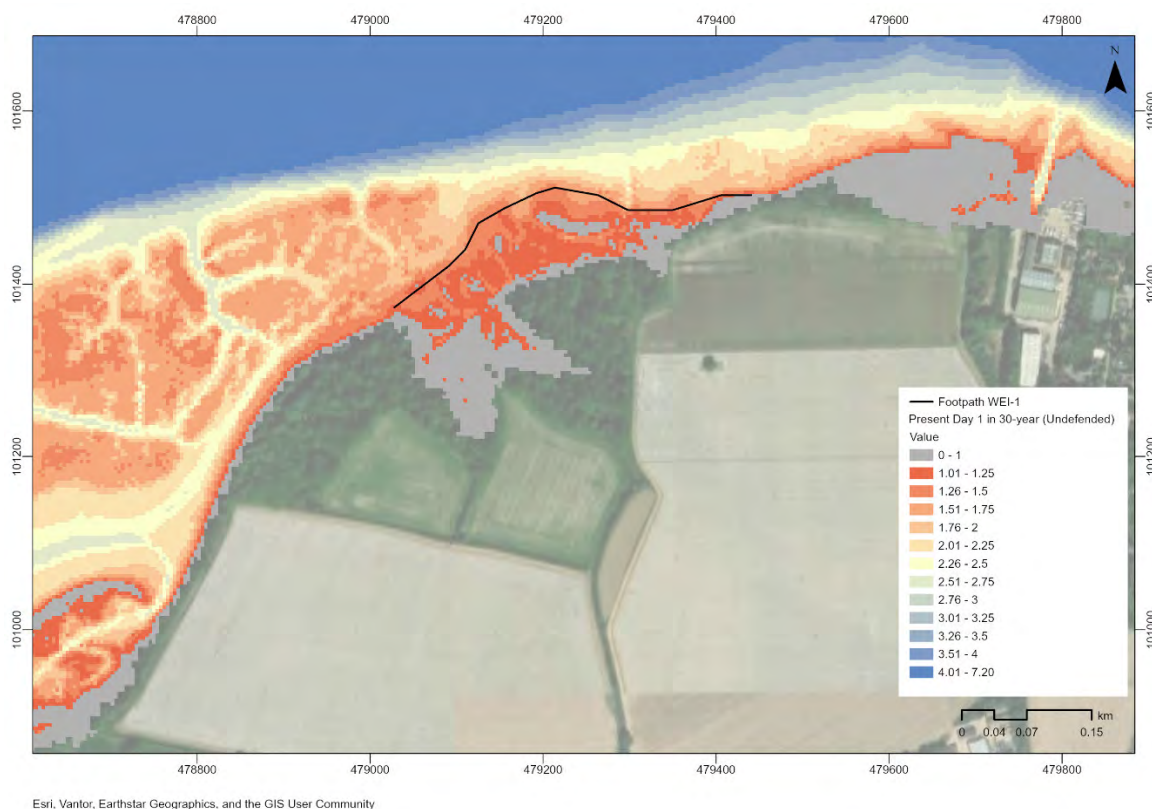
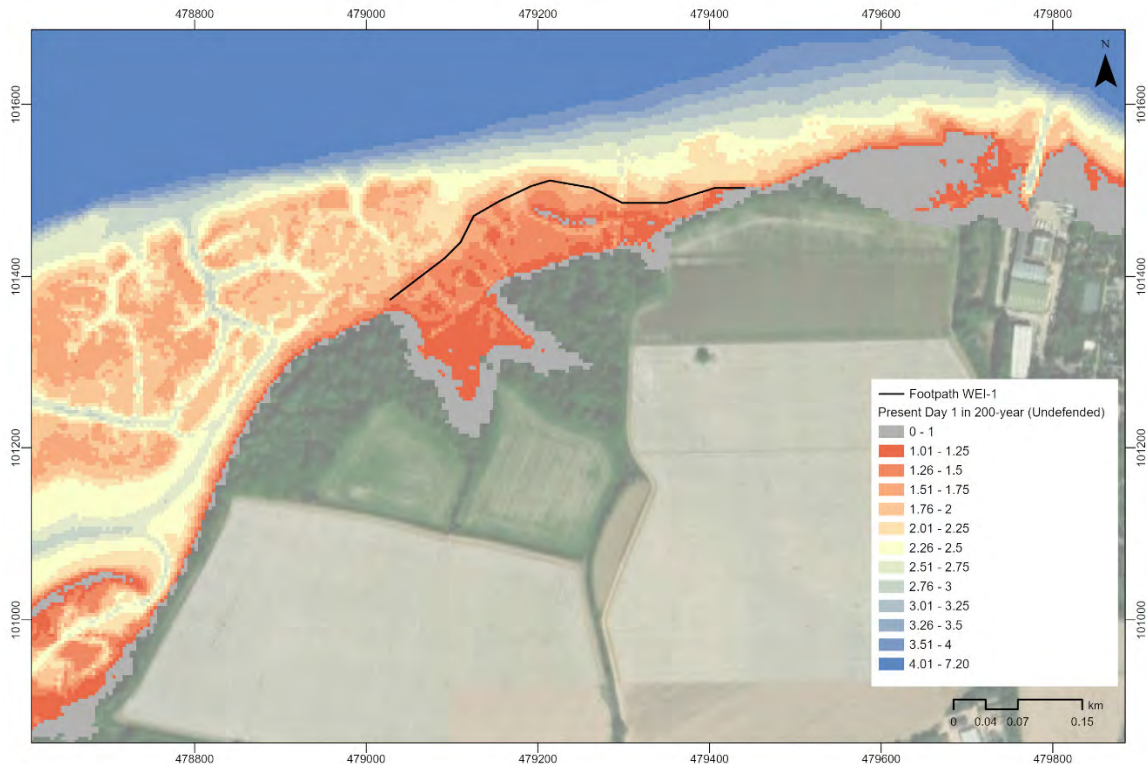


Figure 3.15. Present Day (2023) 1 in 30-year flood extent and depth - Undefended Scenario.



Esri, Vantor, Earthstar Geographics, and the GIS User Community

Figure 3.16. Present Day (2023) 1 in 200-year flood extent and depth - Undefended Scenario.

### 3.4.2.1 Flood Risk along the Footpath

At present day water levels, a 1-1-year return period event would cause 363m (approx. 92%) of the footpath to be submerged. Both the 1-20 and 1-200 return period event would cause almost (approx. 99%) the entire footpath to be underwater. For 2050, 2075 and 2100 the footpath would be entirely (approx. 99 - 100%) underwater for all three extreme water events. Highest astronomical Tide (HAT) with SLR estimates would lead to flooding of 225m (approx. 47%), 467m (approx. 98%), 472m (approx. 99%) of the footpath in 2050, 2075 and 2100, respectively. By 2075, MHWS (under the RCP8.5 70<sup>th</sup> percentile) will result in inundation of lower sections of the footpath. By 2100, MHWS will result in 317m (approx. 66%) of the footpath being underwater. The sections with water levels plotted are shown in Figure 3.17 to Figure 3.20.

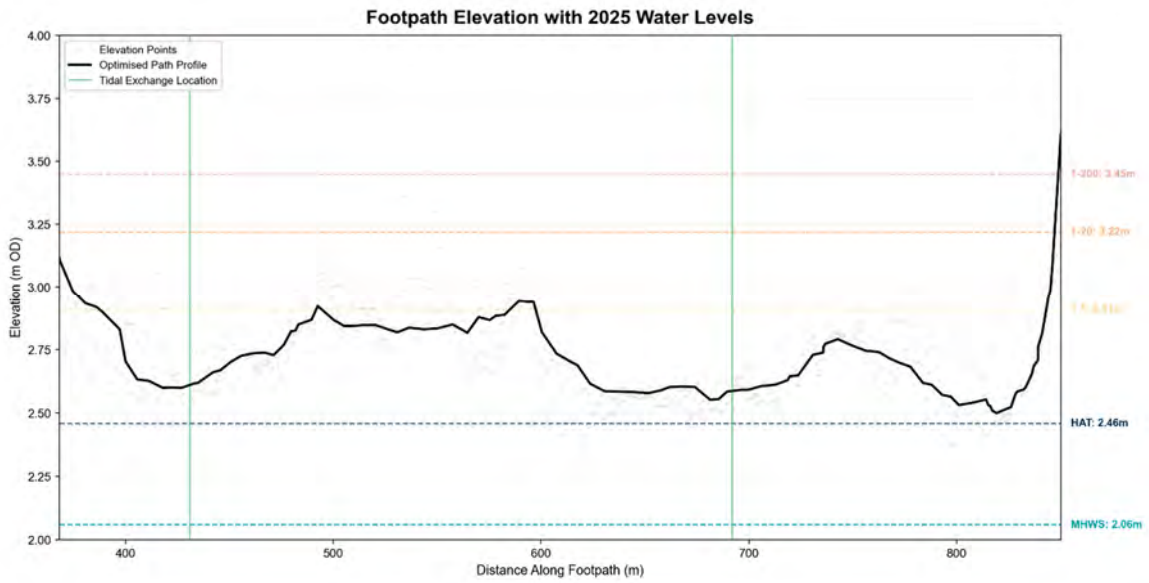


Figure 3.17. Elevation along footpath with the extreme water level events, MHS and HAT for present day (2025) plotted.

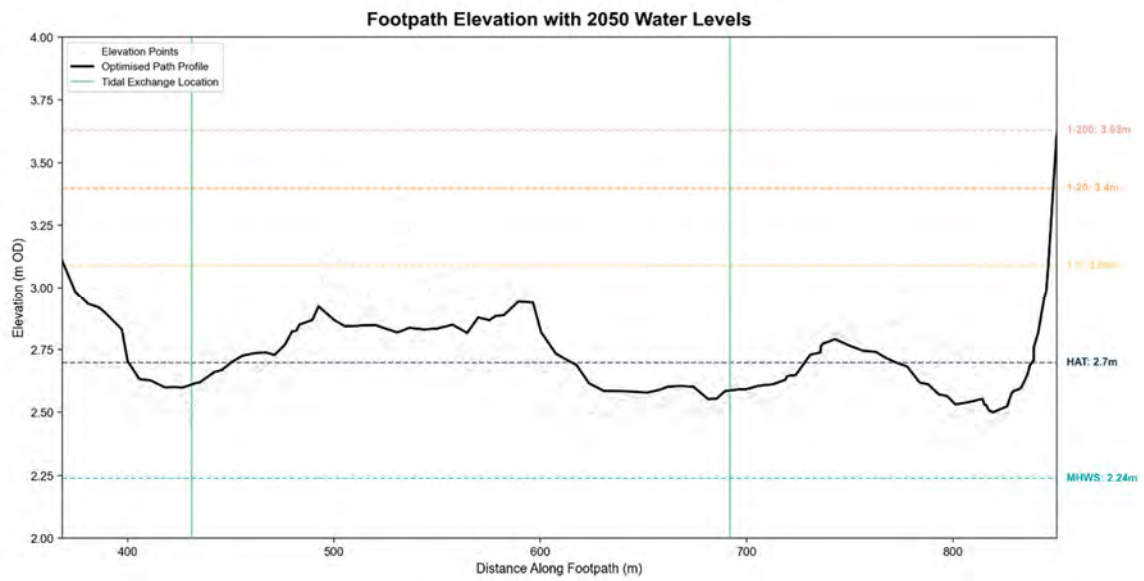


Figure 3.18. Elevation along footpath with the extreme water level events, MHS and HAT for 2050 plotted.

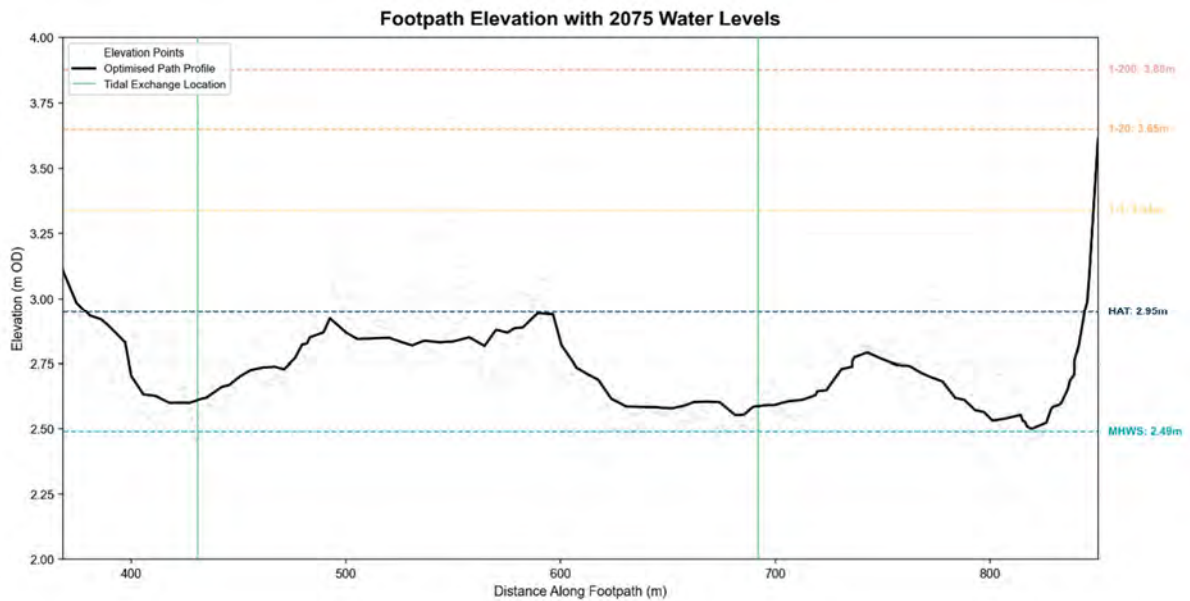


Figure 3.19. Elevation along footpath with the extreme water level events for 2075 and the estimated MHWS and HAT plotted.

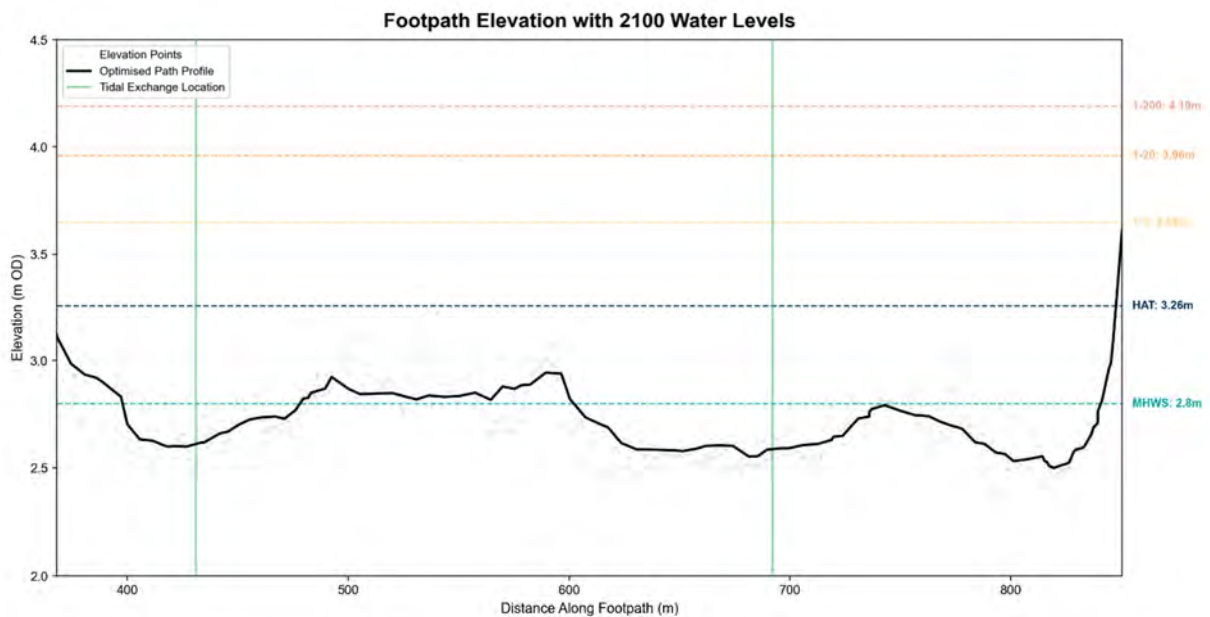
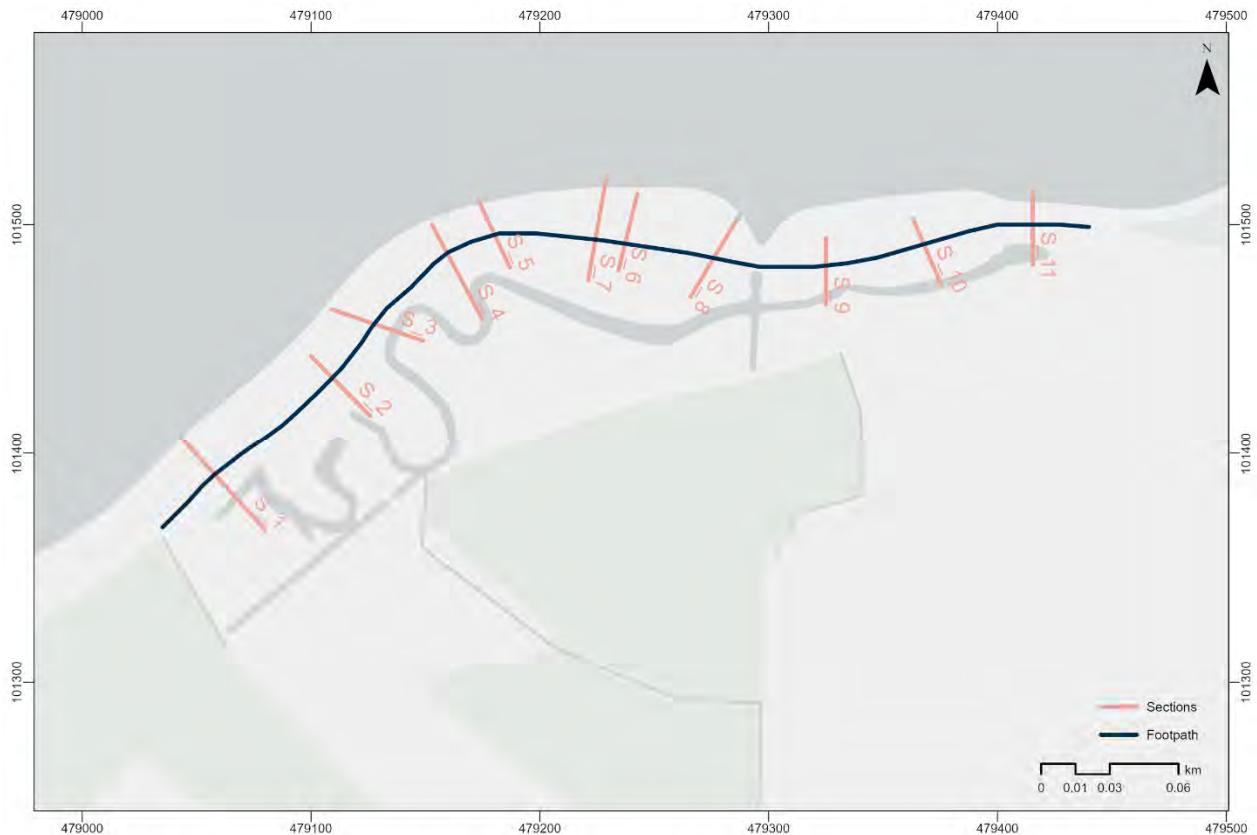


Figure 3.20. Elevation along footpath with the extreme water level events for 2100 and the estimated MHWS and HAT plotted.

To further understand how the footpath maybe impacted by current water levels and extreme water level scenarios, several sections (Figure 3.21) were extracted from a DTM and water levels were plotted. Producing the sections enables the impact to the surrounding land to be understood; additional sections are presented in Appendix A1.



Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Figure 3.21.: Section lines showing where profiles of the footpath were extracted to understand how present day and future water levels will impact the footpath.

Under the present day (2025) water levels, the primary footpath in each section remains accessible at mean high water neap (MHWN) and MHWS. For the extreme water levels, all the sections except S\_4 (Figure 3.22), S\_7 (Figure 3.23) and S\_11 (Figure 3.24) flood for the 1 in 1, 1 in 20 and 1 in 200-year return period events. S\_4 remains accessible for the 1 in 1-year return period event and S\_7 and S\_11 are only partially flooded. In summary, this highlights the immediate vulnerability of the existing footpath and the challenges faced with maintaining this in the short term.

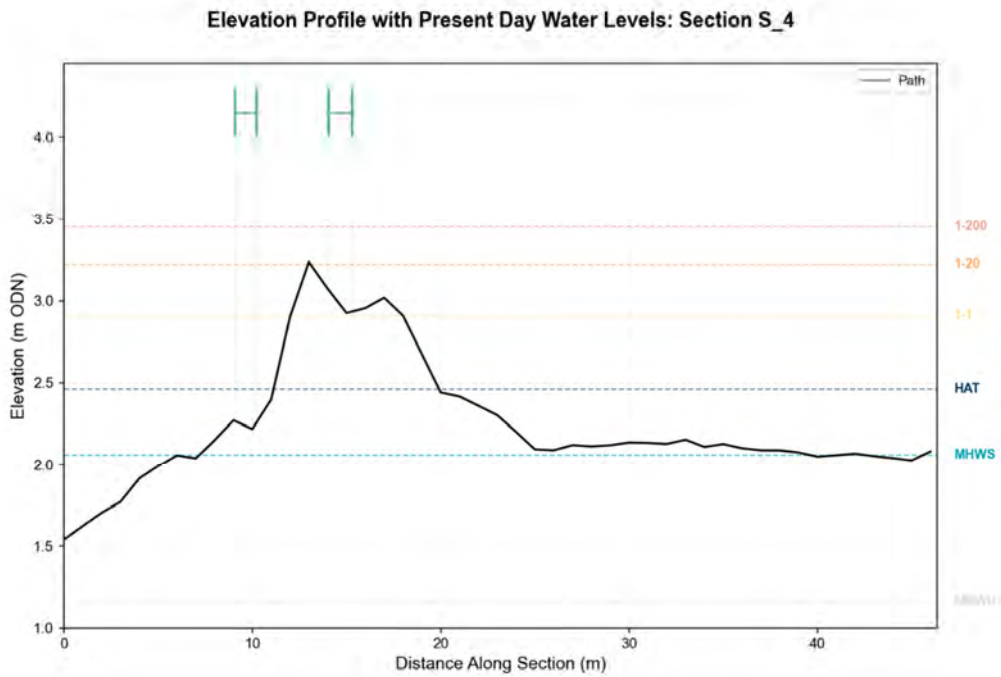


Figure 3.22. S\_4 elevation profile with present day (2025) water levels plotted demonstrating how the footpath could be impacted.

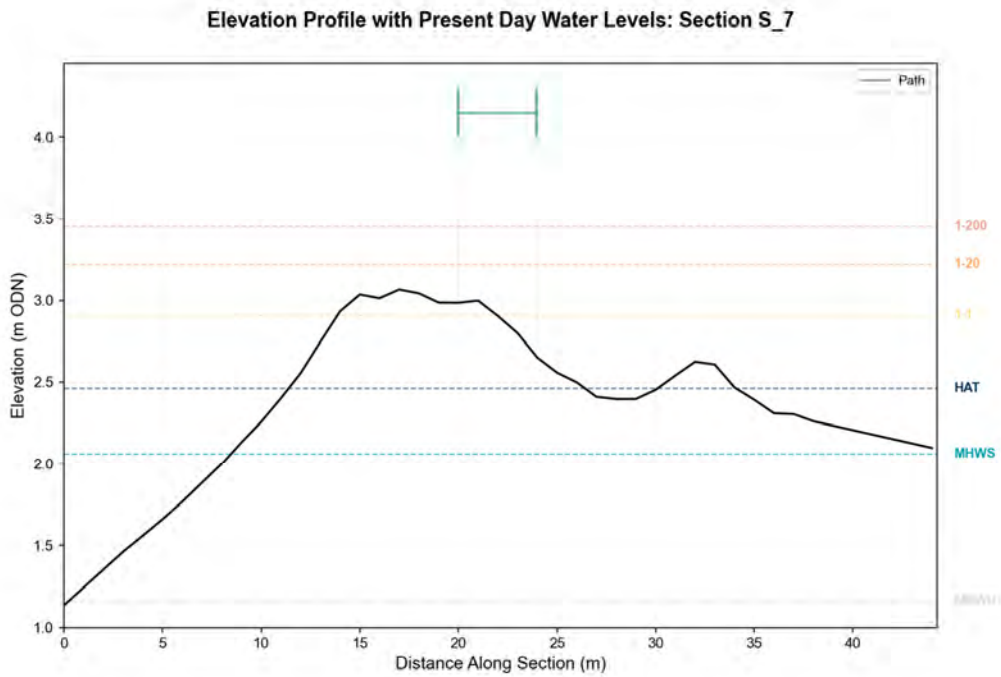


Figure 3.23. S\_7 elevation profile with present day (2025) water levels plotted demonstrating how the footpath could be impacted.

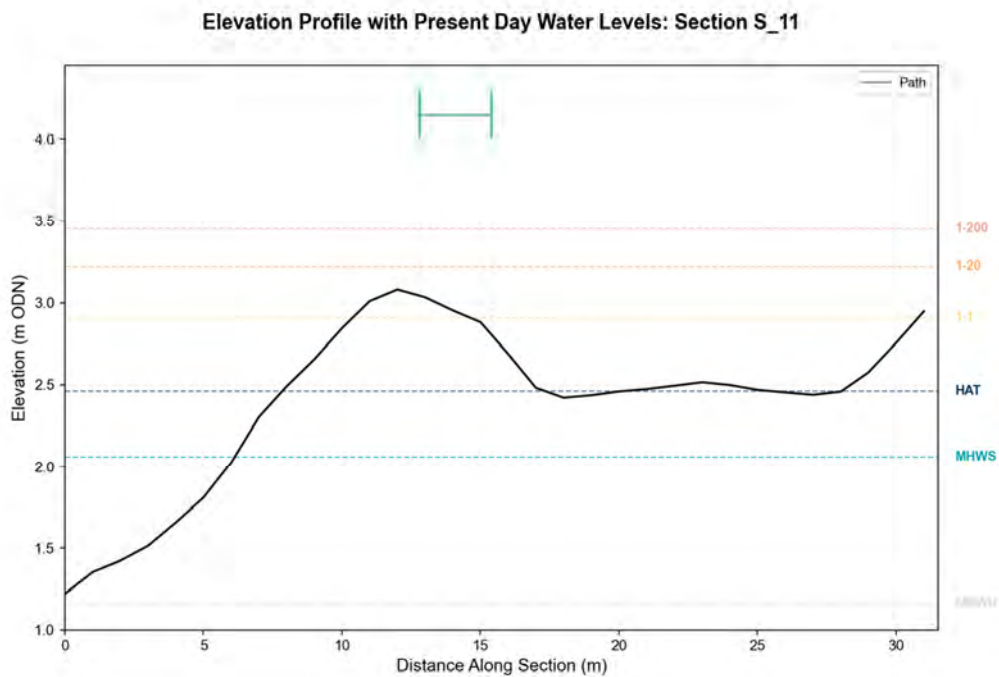


Figure 3.24. S\_11 elevation profile with present day (2025) water levels plotted demonstrating how the footpath could be impacted.

The 2050 water levels, lead to the primary footpath being accessible at MHWS but under the 1 in 1, 1 in 20 and 1 in 200-year return period extreme water level scenarios the primary path is flooded for all sections.

The 2075 water levels, lead to flooding/partial flooding of the primary path at MHWS in S\_6 (Figure 3.25), S\_8 (Figure 3.26) and S\_10 (Figure 3.27). The primary path would likely be flooded under the extreme water level scenarios for all the plotted sections.

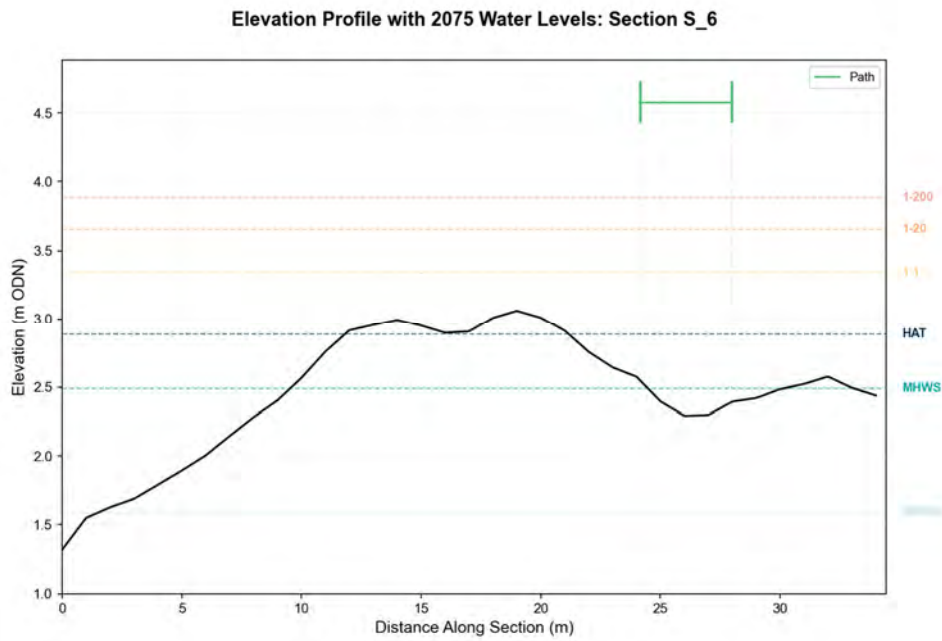


Figure 3.25. S\_6 elevation profile with estimated water levels for 2075 plotted showing how the footpath may be impacted.

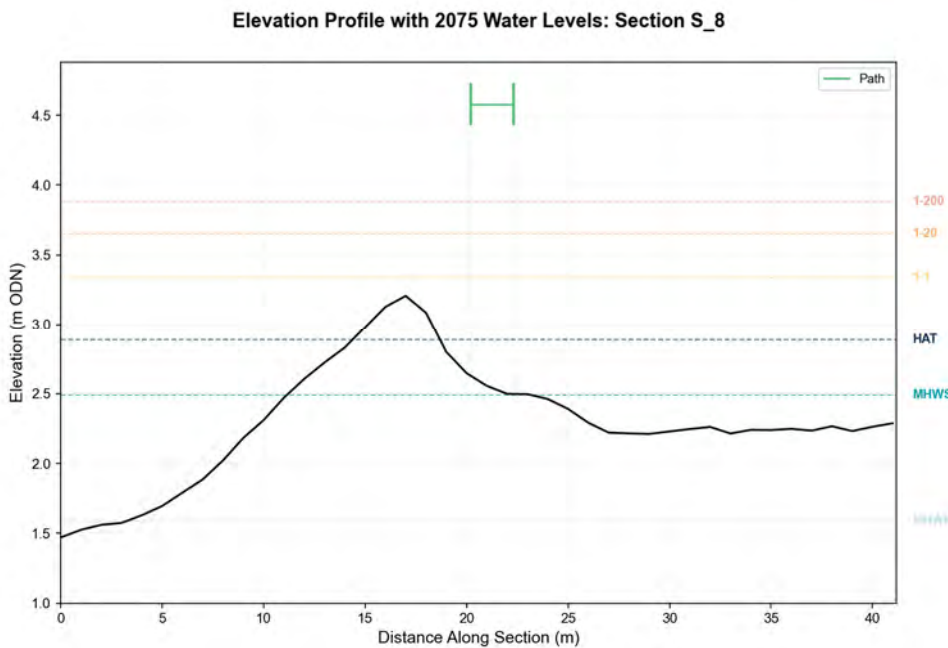


Figure 3.26. S\_8 elevation profile with estimated water levels for 2075 plotted showing how the footpath may be impacted.

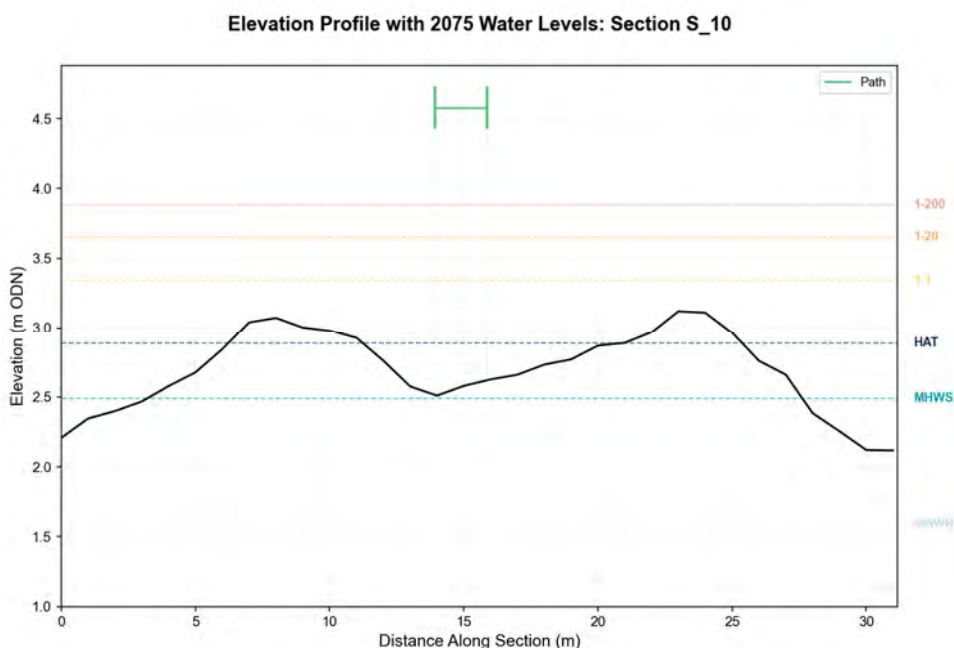


Figure 3.27. S\_10 elevation profile with estimated water levels for 2075 plotted showing how the footpath may be impacted.

### 3.4.3 Coastal Erosion Risk

In January 2025, the Environment Agency released an update to the National Coastal Erosion Risk Mapping (NCERM) data, named NCERM2. The update uses new data and considers climate change, including SLR scenarios, to show current and future erosion risk based on two scenarios: SMP Policy and No Future Intervention (NFI).

The NCERM data only covers areas not protected by formal flood defences, so erosion projections for this section of the coastline are available however the 'frontages' used to associate the different erosion projections cut landward of the footpath, indicating that the vulnerability of the footpath has already been taken into consideration. In addition, since the SMP Policy along this section of coastline is Hold the Line, the erosion estimates for the SMP scenario are zero.

Figure 3.28 shows the erosion rates from the NCERM2 feature line for 10-year intervals from 2030 to 2080. Erosion is predicted to reach approximately 6m along the stretch of the feature line landward of the footpath by 2055. By 2080 erosion is predicted to be ~12m for the feature line landward of the footpath. Understanding the predicted erosion within the study area is essential for assessing re-alignment options.

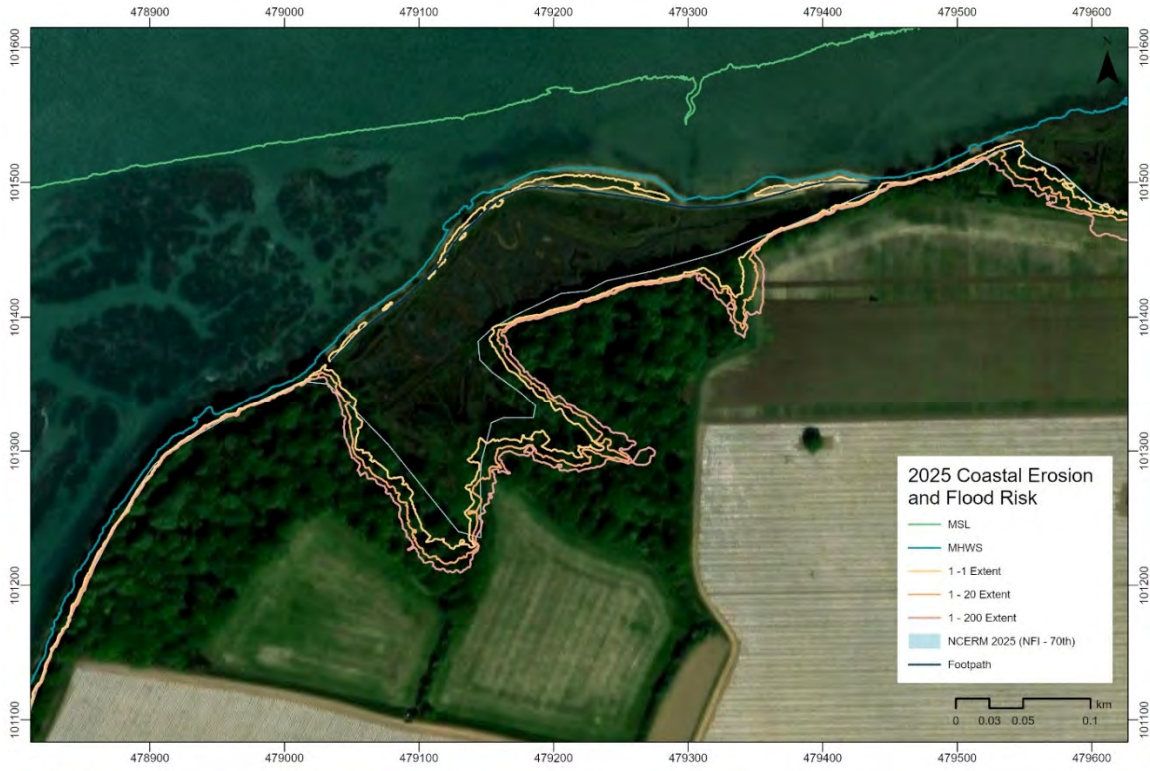


Figure 3.28. NCERM2 No Future Intervention scenario 70th Percentile erosion for 2030 to 2080.

### 3.4.4 Coastal Erosion and Flood Risk

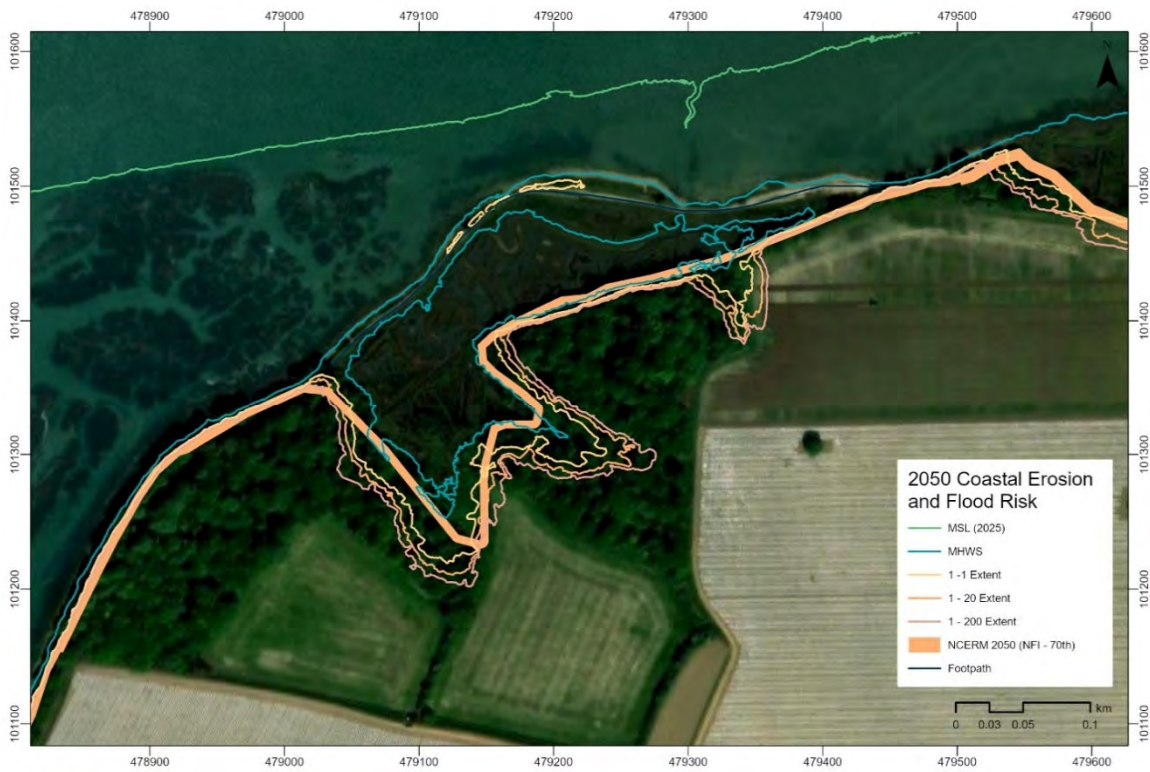
The following figures show both the coastal erosion and coastal flood risk for 2025, 2050, 2075 and 2100 to help visualise the combined effects.

The 2025 map (Figure 3.29) shows the MHWS line seaward of the footpath. However, the flood risk from the 1 in 1, 1 in 20 and 1 in 200-year storms extend landward of the footpath and the erosion risk buffer (NCERM2 NFI 70<sup>th</sup> percentile). By 2050 (Figure 3.30), the erosion buffer has moved further landward along with the flood risk which pushes the MHWS into the saltmarsh landward of the footpath likely impacting the woodlands. In addition, the movement of the MHWS line into the saltmarsh will increase pressure on the footpath in its current condition potentially causing further erosion and loss of the footpath. In 2075 (Figure 3.31), the erosion buffer pushes back into the fields behind the woodlands along the flood risk extending into the woodlands and fields. Finally, the 2100 erosion and flood risk encroaches on a large part of the woodland and the MHWS line has extended into woods.



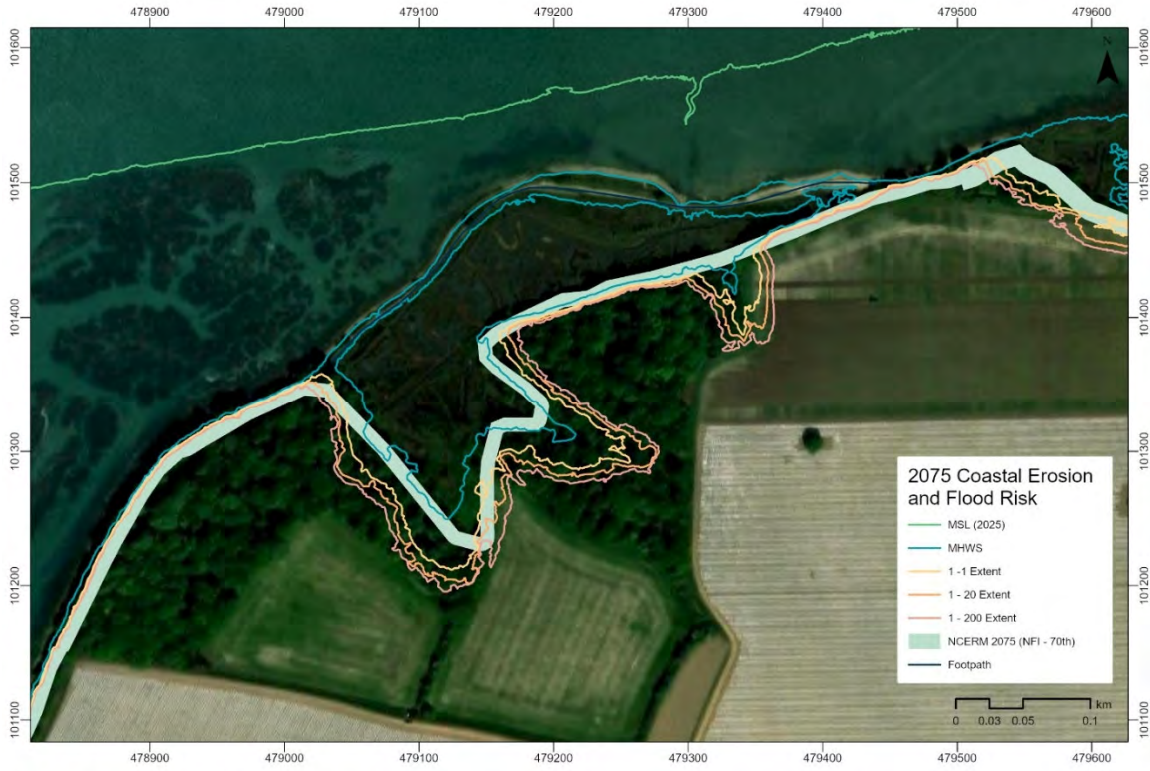
Esri, Vantor, Earthstar Geographics, and the GIS User Community

Figure 3.29. Coastal erosion and flood risk for 2025.



Esri, Vantor, Earthstar Geographics, and the GIS User Community

Figure 3.30. Coastal erosion and flood risk for 2050.



Esri, Vantor, Earthstar Geographics, and the GIS User Community

Figure 3.31. Coastal erosion and flood risk for 2075.



Esri, Vantor, Earthstar Geographics, and the GIS User Community

Figure 3.32. Coastal erosion and flood risk for 2100.

## 4 Habitat Creation

The extent and type of coastal habitat that exists is closely tied to tidal levels. In the UK (and elsewhere) saltmarsh initially colonises areas between approximately MHWN tide and MHWS tide, with areas lower than this down to mean low water spring (MLWS) tide forming mudflat (Allen, 2000; Figure 4.1). Another important aspect is the availability of suitable plant species for colonisation; different plants can colonise at lower levels than others. However, in general terms, the elevation of a site relative to the varying tidal range is used as an initial indicator of the habitats that could evolve (Table 4.1). Hence, the topography of the site and the tidal heights adjacent to it are one of the principal issues to be considered at the planning stage of creating a new footpath to increase saltmarsh habitat.

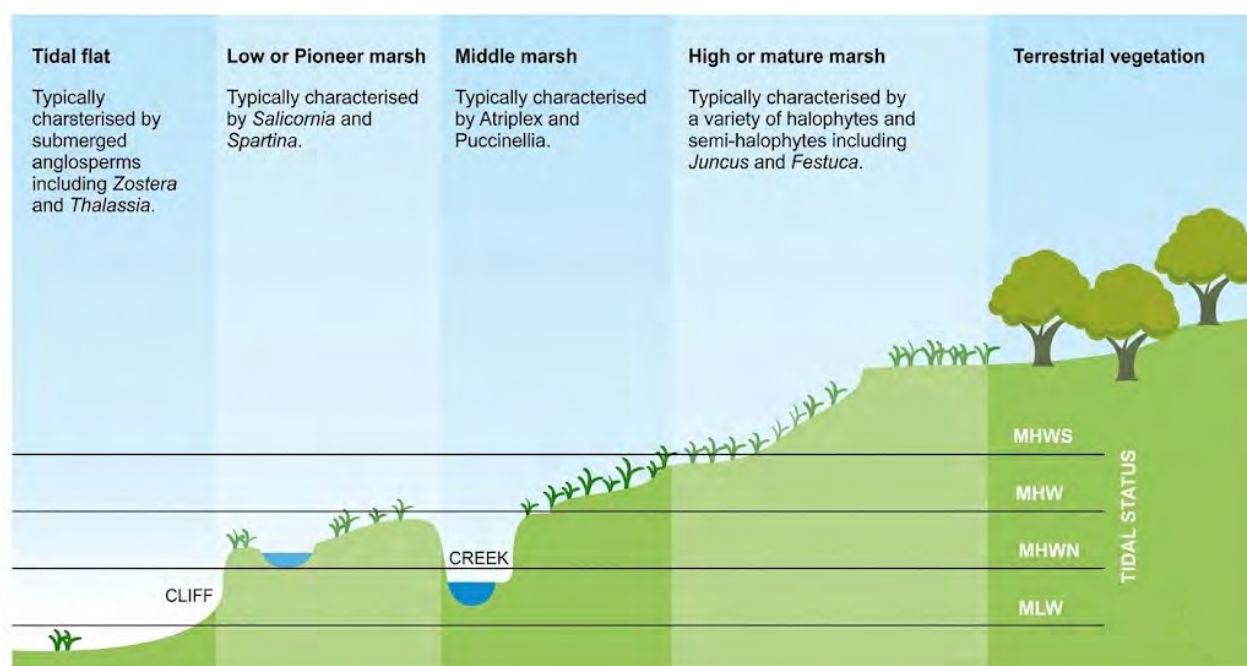


Figure 4.1. Approximate relationship between habitat and tidal datums.

Table 4.1: Coastal habitat types and the water levels in which they will establish.

From	To	Primary Habitat
MLWS	MLWN	Intertidal mudflats and sandflats
MLWN	MHWN	Pioneer saltmarsh
MHWN	MHWS	Saltmarsh
MHWS	HAT	Transitional saltmarsh

### 4.1 Historical Saltmarsh Opportunity Assessment

The Solent Dynamic Coast Project (SDCP) focused on coastal habitats across the north Solent that faced immediate threat from climate change and coastal management decisions (Cope et al., 2008). The project looked at the potential for future saltmarsh and mudflat habitat while also looking at where loss of habitats would occur. Sediment accumulation was incorporated into the analysis with existing and potential habitat forecasted for 2025, 2055 and 2100 for three scenarios; no sediment accretion, 3mm and 6 mm sediment accretion per annum.



Figure 4.2 shows the 2025 'existing' and 'potential' mudflat and saltmarsh with 0mm sediment accumulation from the SDCP alongside the saltmarsh habitat map produced in 2019. This SDCP map matched the 2019 saltmarsh extent best highlighting the likelihood of a negative sediment accumulation since the mapping was produced. The map also shows how the potential areas of saltmarsh on the SDCP are now zones which the saltmarsh has pushed back into suggesting the maps produced from the SDCP for future timeframes could be good for guiding future opportunities within the project area.

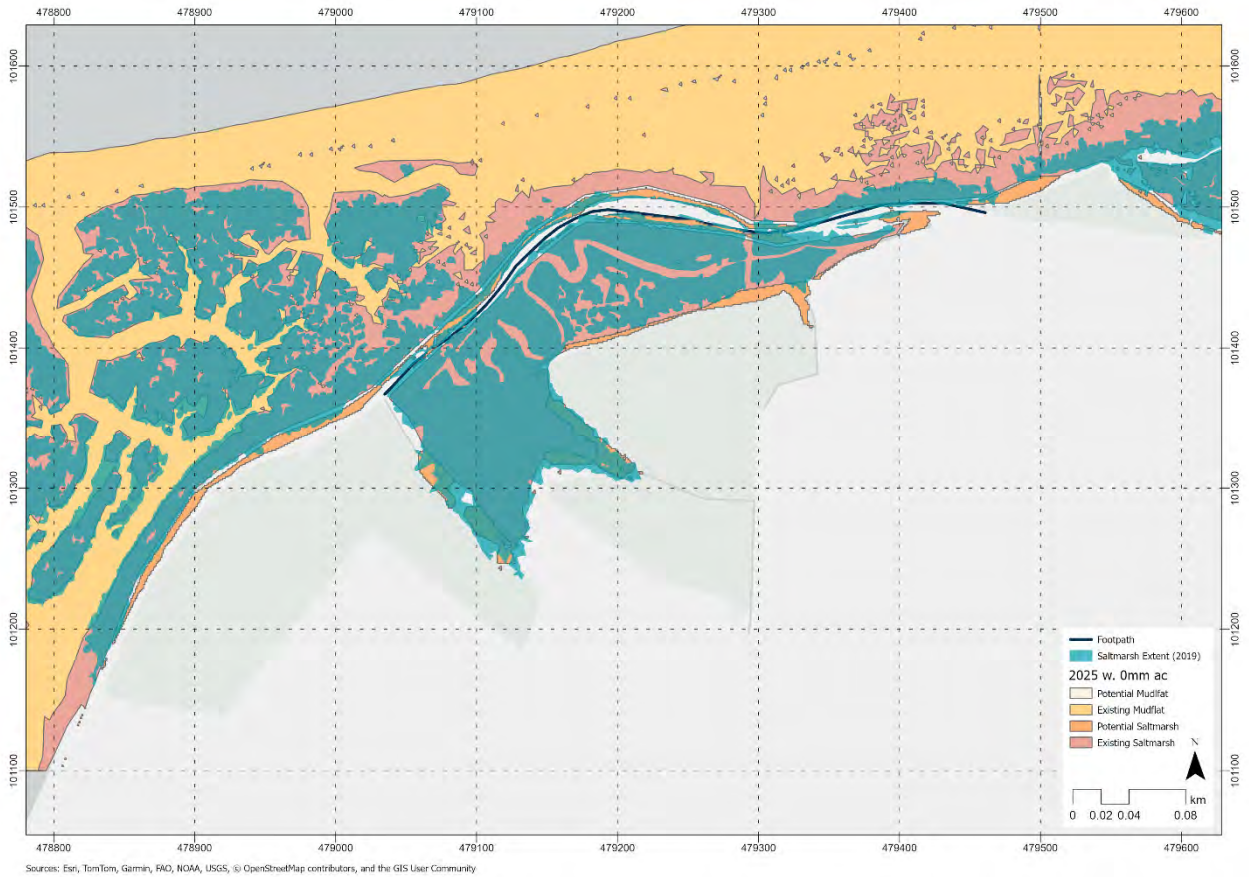


Figure 4.2. Saltmarsh and mudflat 'existing' and 'potential' habitat from the Dynamic Solent Project for 2025 with 0mm sediment accumulation compared to the saltmarsh extent for 2019.

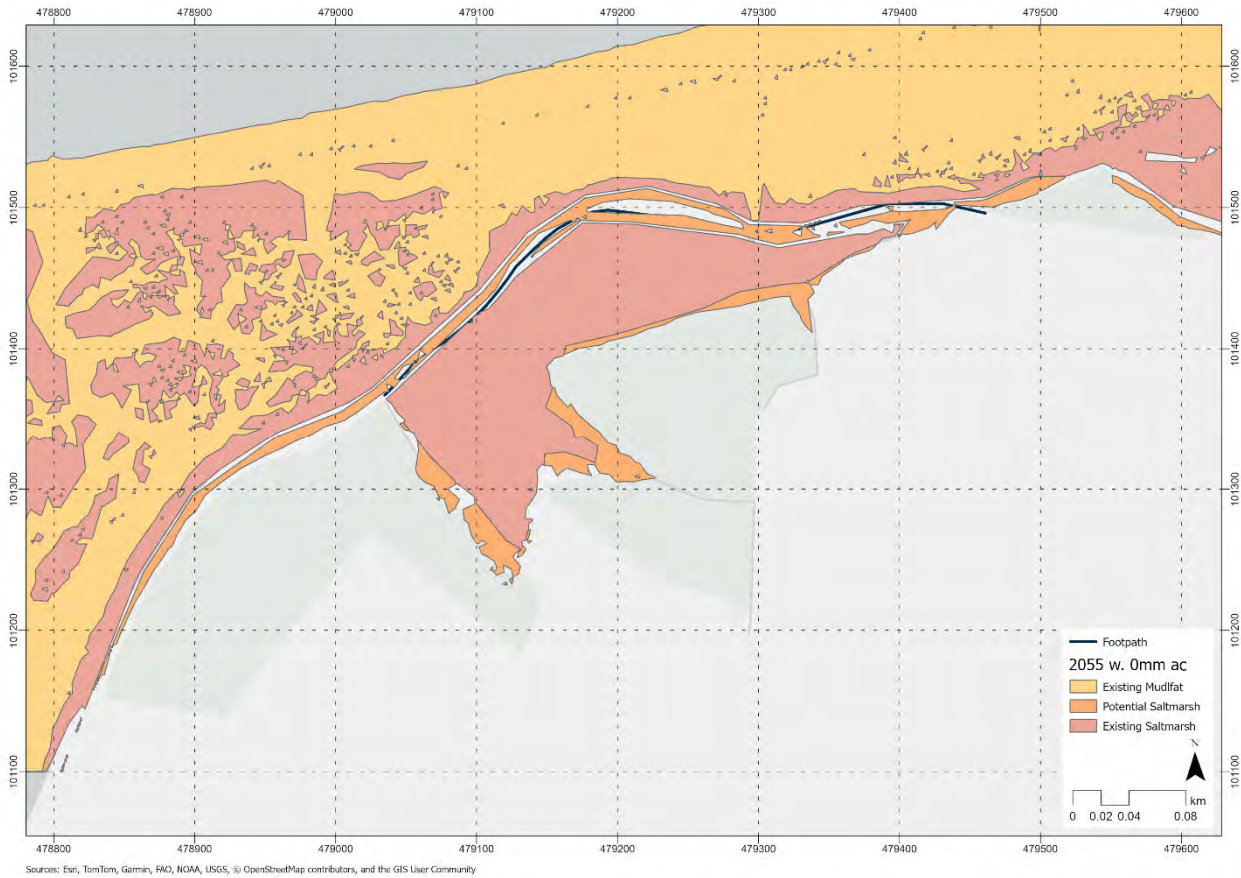


Figure 4.3. Saltmarsh and mudflat 'existing' and 'potential' habitat from the Dynamic Solent Project for 2055 with 0mm sediment accumulation.

The 2105 map with 0mm of sediment accumulation shows potential saltmarsh rolling back into the current footpath area, highlighting the need to relocate the current footpath to enhance saltmarsh within the project area.

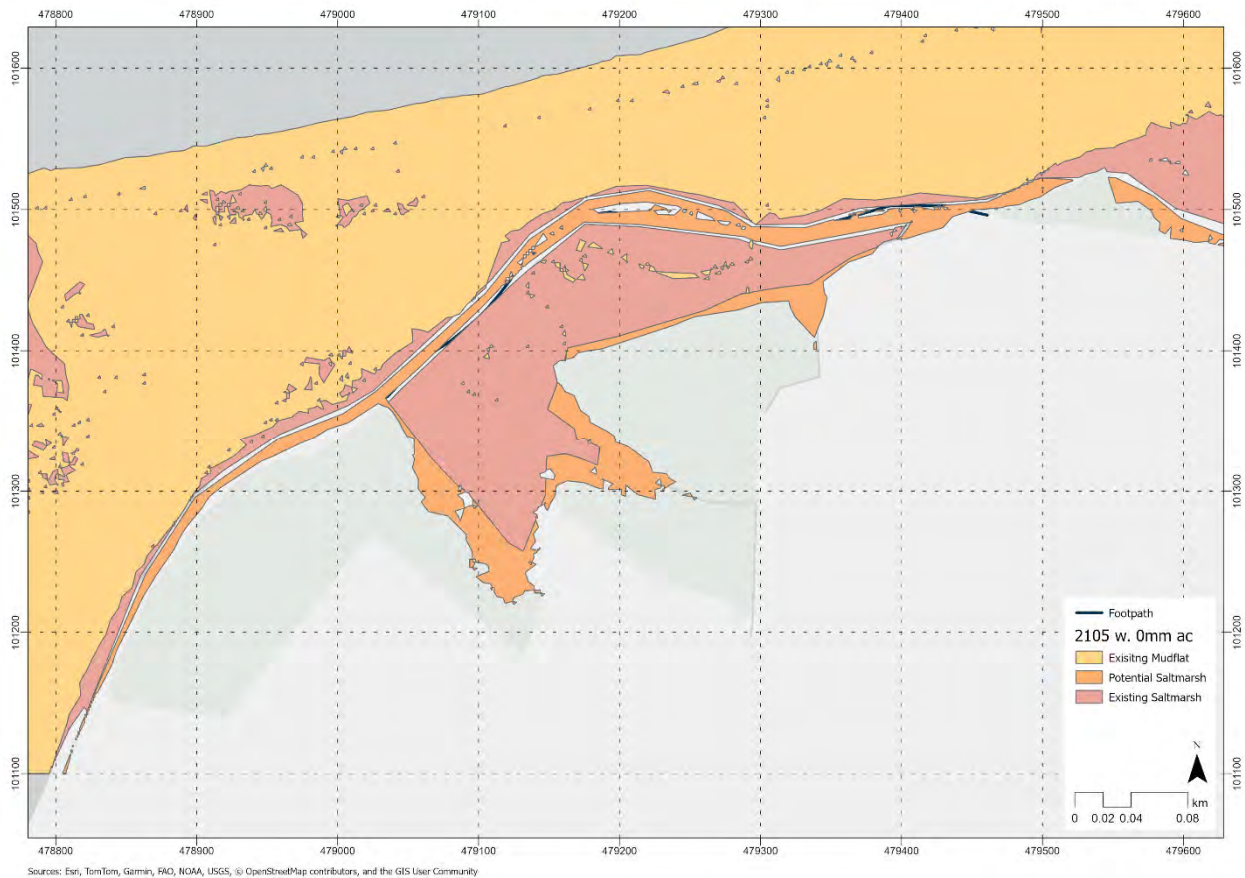


Figure 4.4. Saltmarsh and mudflat 'existing' and 'potential' habitat from the Dynamic Solent Project for 2105 with 0mm sediment accumulation.

## 4.2 Saltmarsh at Risk

Large areas of saltmarsh in England have been lost (~85%) since 1860 (UK Centre for Ecology & Hydrology, 2023). Loss of saltmarsh has occurred due to the draining and reclamation of land and more recently due to climate related factors.

The saltmarsh habitat around the footpath, has a maximum elevation of approximately 5mOD, but the majority sits below 3mOD. To understand how the saltmarsh habitat will be impacted in the future the estimated MHWN and MHWS along with extreme water levels for 1 in 1, 1 in 20 and 1 in 200-year storm events for 2050, 2075 and 2100 were used to identify zones of marsh at risk.

From present day (2023; Figure 4.5) to 2050 (Figure 4.6) there is a significant loss of mature marsh landward of the footpath. Additionally, a small amount of saltmarsh seaward of the footpath will likely transition from low/middle marsh to mudflats. From 2050 (Figure 4.6) to 2075 (Figure 4.7) a substantial amount of low/medium saltmarsh will become mudflats seaward of the footpath. There will also be more loss of high marsh landward of the footpath. By 2100 (Figure 4.8) almost all the saltmarsh seaward of the footpath will now have transitioned to mudflats, and a further loss of mature saltmarsh will occur around the footpath.

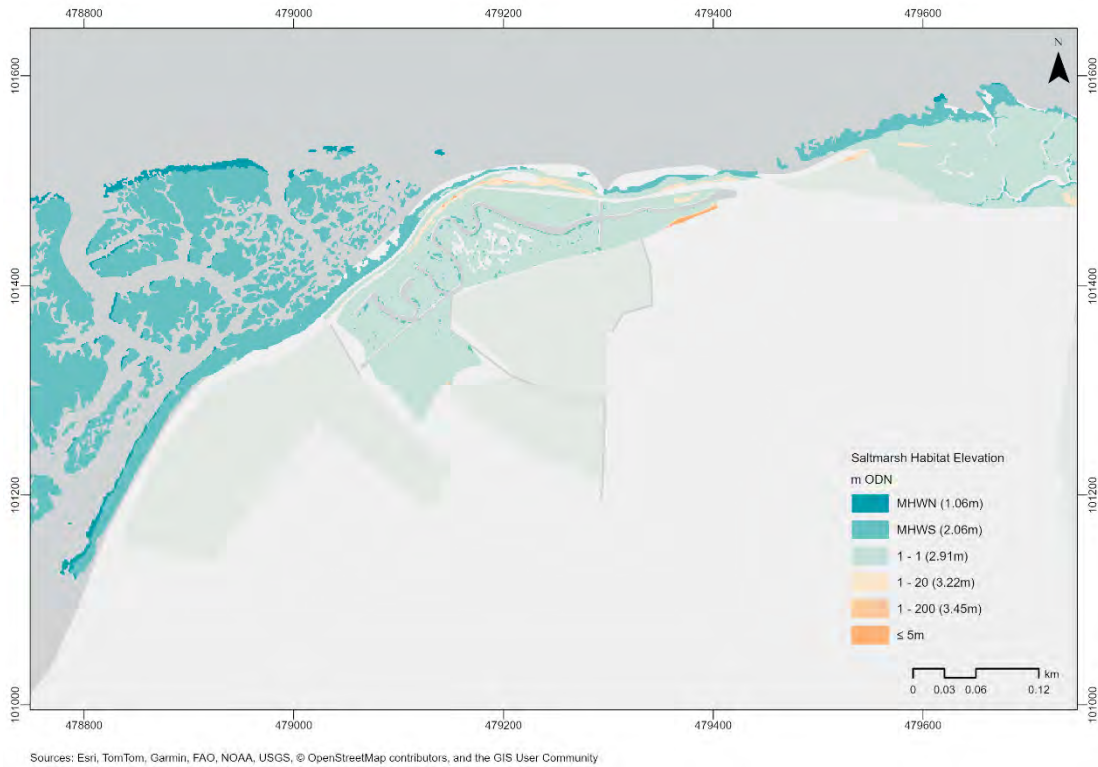


Figure 4.5. Saltmarsh habitat elevation relative to water levels for present day (2023).

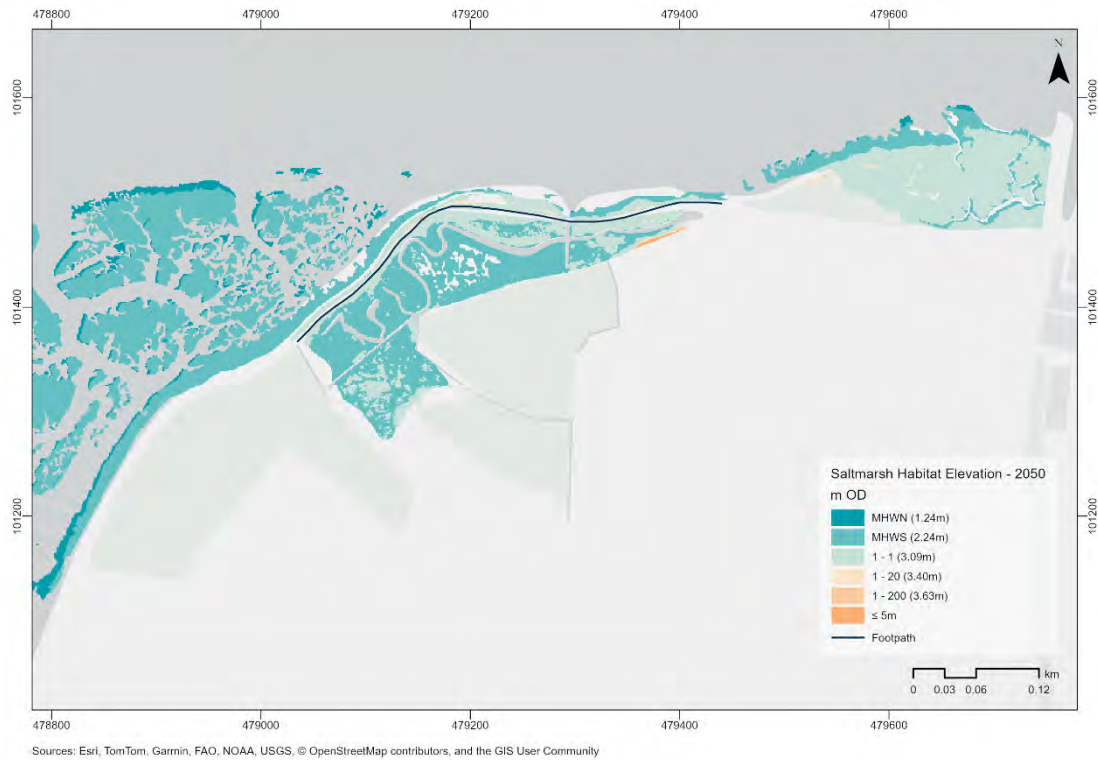


Figure 4.6. Saltmarsh habitat elevation relative to estimated water levels in 2050.

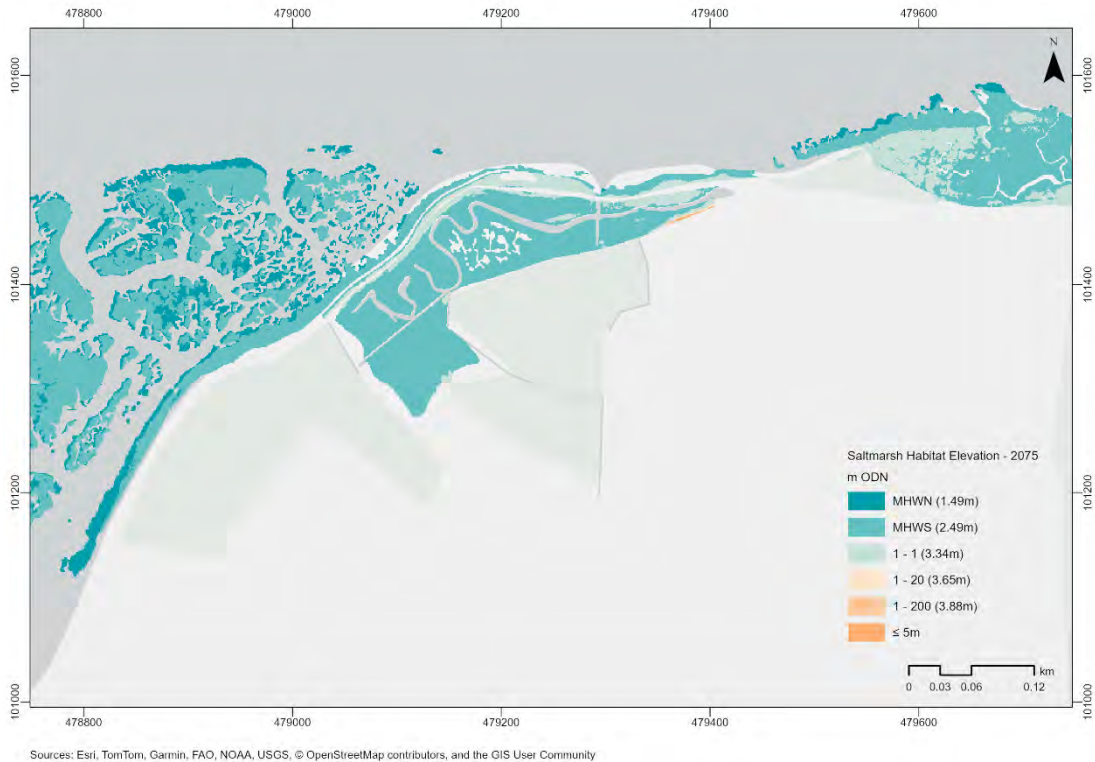


Figure 4.7. Saltmarsh habitat elevation relative to estimated water levels in 2075.

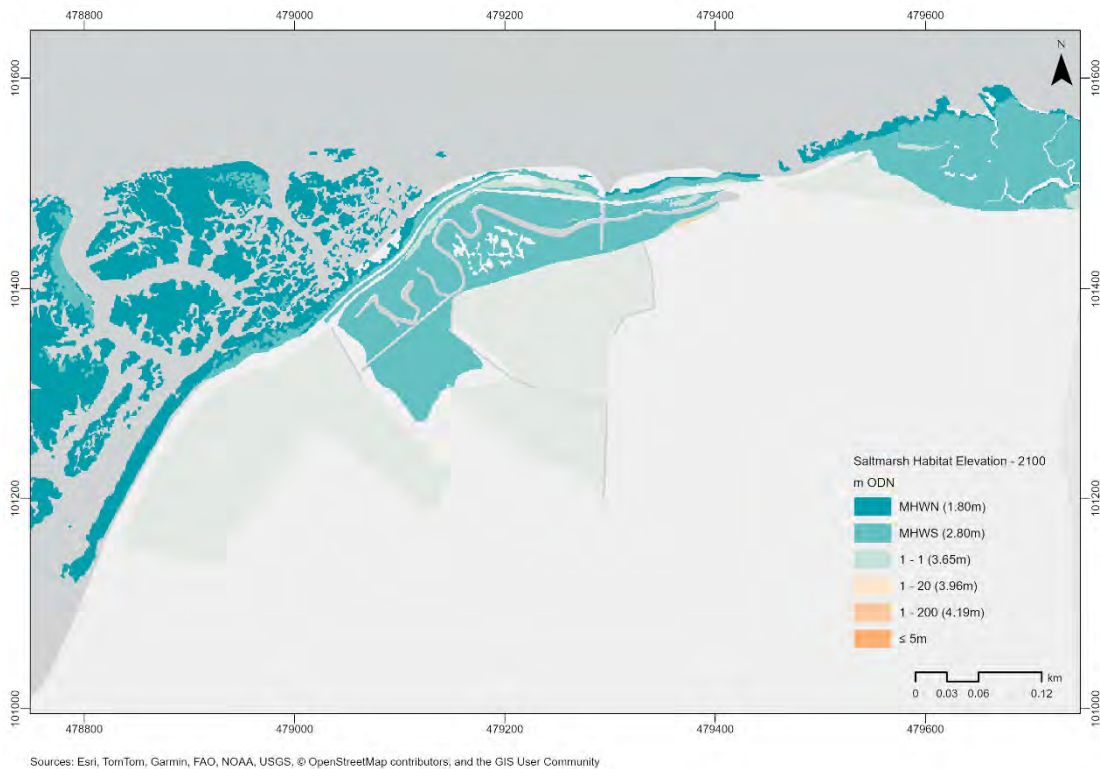


Figure 4.8. Saltmarsh habitat elevation relative to estimated water levels in 2100.

### 4.3 Saltmarsh Habitat Opportunities

Using the LiDAR data as a topographic base map, and future water levels (3.2.1) predicted habitat type maps were created for 2050, 2075 and 2100 as show in Figure 4.6 to Figure 4.8. Since the saltmarsh landward of the footpath is tidal, it is likely that the saltmarsh habitat will push back into the neighbouring woodlands and agricultural land. Transitional saltmarsh would creep into the woodland, with the increase in salinity negatively impacting terrestrial plants. As sea levels rise a considerable amount of transitional saltmarsh would be lost becoming saltmarsh, additionally almost all the saltmarsh seaward of the footpath would transition to pioneer saltmarsh. By 2100, much of the footpath if left at current elevation could become saltmarsh. Predictions of the types and extents of habitat created a shown in Table 4.2.

Table 4.2: Opportunities for habitat creation as water levels rise.

Year	Transitional saltmarsh (ha) (MHWS to HAT)	Saltmarsh (ha) (MHWN to MHWS)	Pioneer saltmarsh (ha) (MLWN to MHWN)	Intertidal mudflats and sandflats (ha) (MLWS to MLWN)	Total saltmarsh (ha)
2050	1.21	3.61	4.37	1.24	10.43
2075	0.84	3.74	4.70	1.53	10.81
2100	0.75	3.83	4.81	1.66	11.05

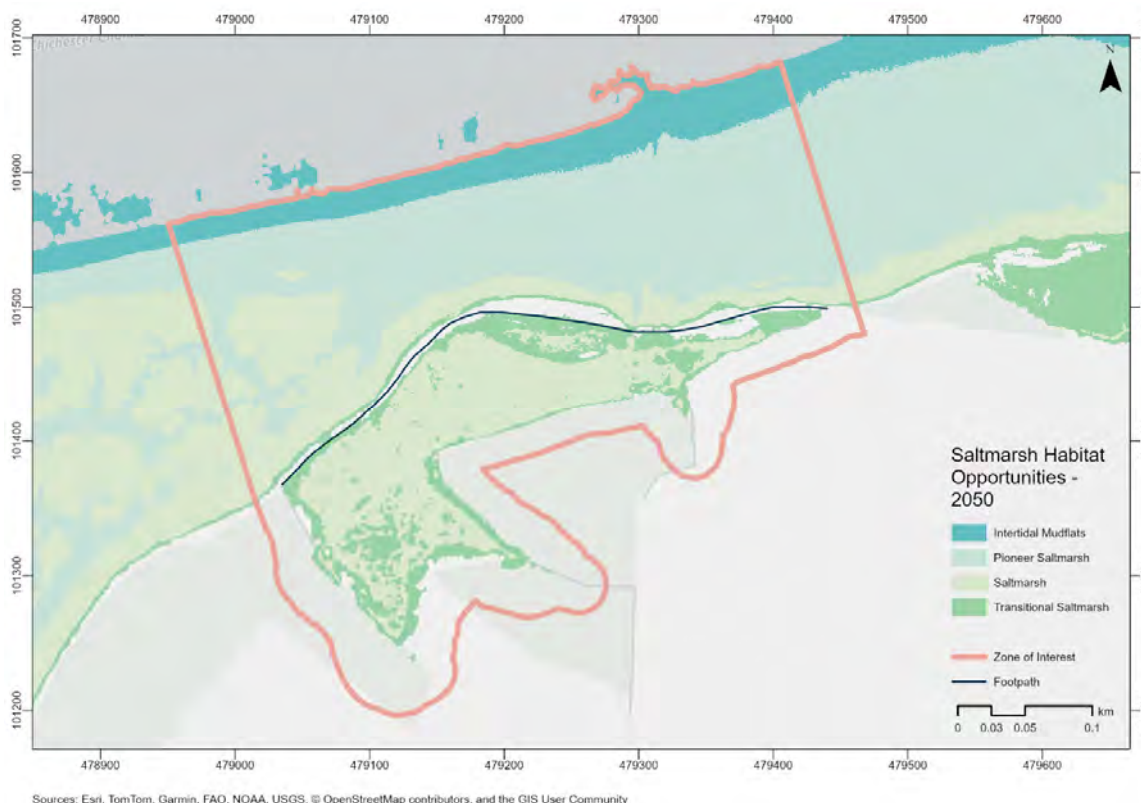
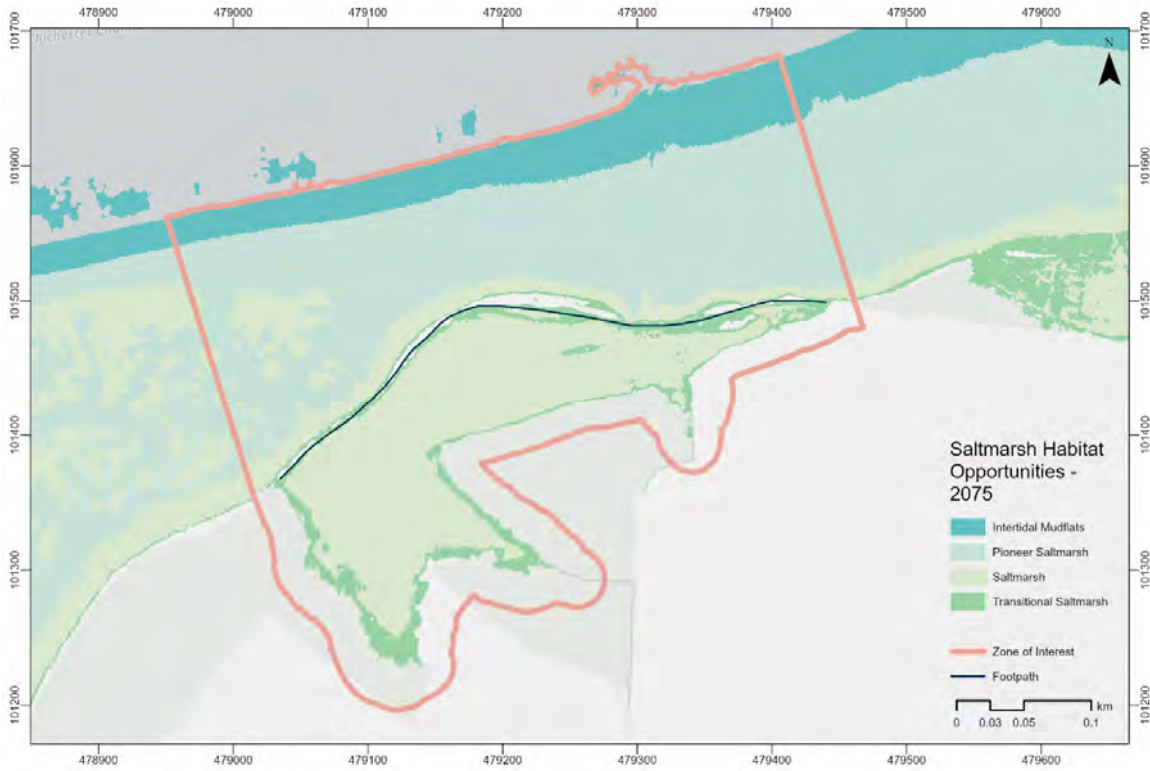


Figure 4.9. Opportunities for saltmarsh habitat development by 2050.



Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Figure 4.10. Opportunities for saltmarsh habitat development by 2075.



Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Figure 4.11. Opportunities for saltmarsh habitat development by 2100.

By ensuring connectivity of the surrounding area, natural coastal processes would be able to shape the intertidal habitat. This would allow the area to naturally erode, helping increase sediment supply and enabling sedimentation within the saltmarsh. Sedimentation is a mechanism that can enable the elevation within the saltmarsh to increase naturally and keep pace with SLR.

## 5 Legal and Policy Implications

This section outlines additional contextual and policy-related factors relevant to West Itchenor, including local planning frameworks, key stakeholders, historical and environmental sensitivities, and public access routes.

- West Itchenor Parish Council is the local-level council. Therefore, the project must consider Chichester District Council's specific local policies that preserve the historical Saxon character and surrounding landscape while ensuring connections with the natural world through interactions along the shoreline.
- Regarding local master plans and planning policy, the area of interest is situated within the district level of Chichester District Council and the county level of West Sussex County Council. A review of The Chichester Local Plan: Key Policies 2021–2039<sup>6</sup> was conducted by Haskoning. Relevant considerations to fulfil policy requirements are outlined in Table 5.1.
- The New Lipchis Way (Part of the King Charles III Coastal Path) is an approximately 38-mile long distance footpath, running from Liphook in Hampshire to West Wittering in West Sussex. The path runs along footpath WEI-1. All options should seek to ensure connectivity of the footpath.
- There is a statutory duty to protect SSSI land, with the potential impact on special habitats, species or the geology having to be considered. Natural England would have to be approached for approval before any work could be carried out that could damage the special scientific interest of a SSSI.

Table 5.1: Relevant considerations and policy requirements from the Chichester Local Plan: Key Policies 2021-2039.

Consideration	Policy Requirement
Connectivity	Must maintain or improve links between residents and services (Policy P4).
Natural Assets	Must demonstrate no adverse effect upon "Strategic Wildlife Corridors" and protected trees (Policies NE4, NE9). Must preserve or enhance the character or appearance of conservation areas (Policy P11).
User Experience	Must be "safe and attractive," avoiding narrow or hidden "alleyway" designs (Policy P1). Must be inclusive not exclude any segment of the populations (Policy P1).
Legal Compliance	Must meet Biodiversity Net Gain and Habitats Regulation requirements (Policies NE5, NE6) Must ensure Public Rights of Way remain functional for all users (Policy T3). Must give priority to walking, cycling and mobility users (Policy T3).

<sup>6</sup> [Chichester Local Plan 2021-2039 - Adoption Version.pdf](#)

Consideration	Policy Requirement
Green Infrastructure	Must contribute to the provision of green and blue infrastructure and protect or enhance existing green or blue infrastructure (Policy P14).

## 5.1 Biodiversity Net Gain (BNG)

It is required for almost all developments in England to deliver at least a 10% measurable increase in biodiversity value (Department for Environment, Food & Rural Affairs, 2025). This is a pre-commencement requirement, meaning development can not legally start until a Biodiversity Gain Plan has been submitted and approved by the Local Planning Authority. In addition, habitat providing the 10% BNG must be maintained for 30 years. The Mitigation Hierarchy and Statutory Metric Policy dictate a strict mitigation hierarchy outlined below with relevance to this project:

1. **Avoid:** The first priority is to avoid harm to existing high value habitats.
2. **Minimise:** If the path must be moved, the design must minimise the footprint and impact on the environment.
3. **Compensate On-Site:** Biodiversity improvements should be made along the new path route.
4. **Offset Off-Site:** If a 10% gain cannot be achieved within the protection boundary, habitat creation can be paid for elsewhere or “biodiversity units” can be purchased.

Gains must be calculated using the Statutory Biodiversity Metric<sup>7</sup>. While the policy is broad, exemptions apply to developments affecting less than 25m<sup>2</sup> of habitat or 5m of linear habitat. The BNG policy requirements for England are embedded in the Chichester Local Plan.

<sup>7</sup> [Statutory biodiversity metric tools and guides - GOV.UK](#)

## 6 Potential Design Options

Five potential route options were identified and are shown in Figure 6.1. The options were developed with the following aims guiding the routes:

1. Longevity of the footpath regarding water levels and erosion predictions;
2. Accessibility; and,
3. Opportunities for saltmarsh habitat restoration and creation.



Figure 6.1. Footpath options.

### 6.1 Option 0 – ‘do nothing approach’

Option 0 (‘do nothing approach’) maintains the current views of the harbour, but it is most vulnerable to coastal processes. This route is not accessible for all users and has experienced flooding during high tides, with the board walk lifting out of the ground. Based on elevation plots, the path faces immediate risks from storm surges and is projected to reach a tipping point by 2075 where MHS results in permanent loss of access. Note, this is based on its current form and assumes no further erosion or change over time, so the tipping point is likely to occur sooner than 2075. Its proximity to the saltmarsh also creates a conflict between public access and the health of the saltmarsh. This route is approximately 1.04km long and takes between 13 to 18 minutes to walk (Cronkleton, 2025).

Table 6.1: Option 0 advantages, disadvantages, constraints and uncertainties relating to technical, environmental and social factors.

Criteria	Advantages	Disadvantages	Constraints	Uncertainties
Technical	<ul style="list-style-type: none"> <li>No work required to the existing footpath.</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>Allows the coastline to naturally roll-back over time.</li> </ul>	<ul style="list-style-type: none"> <li>Currently at risk of storm inundation.</li> <li>Will experience regular inundation at MHWS by 2075.</li> </ul>	<ul style="list-style-type: none"> <li>Prevents future saltmarsh habitat growth.</li> <li>Priority of path to saltmarsh habitat results in trampling.</li> </ul>	<ul style="list-style-type: none"> <li>Rates of coastal erosion vs. path lifespan.</li> <li>Frequency of storm surges.</li> </ul>
Social	<ul style="list-style-type: none"> <li>Maintains current footpath views and route in the short term.</li> </ul>	<ul style="list-style-type: none"> <li>Path is not accessible to users with reduced mobility.</li> <li>Route is challenging for people with pushchairs, prams or cyclists.</li> </ul>	N/A	N/A
Economic	<ul style="list-style-type: none"> <li>£0 cost for Do Nothing.</li> </ul>			



Esri, Vantor, Earthstar Geographics, and the GIS User Community

**Footpath Option 0 Elevation - Water Level Scenarios**

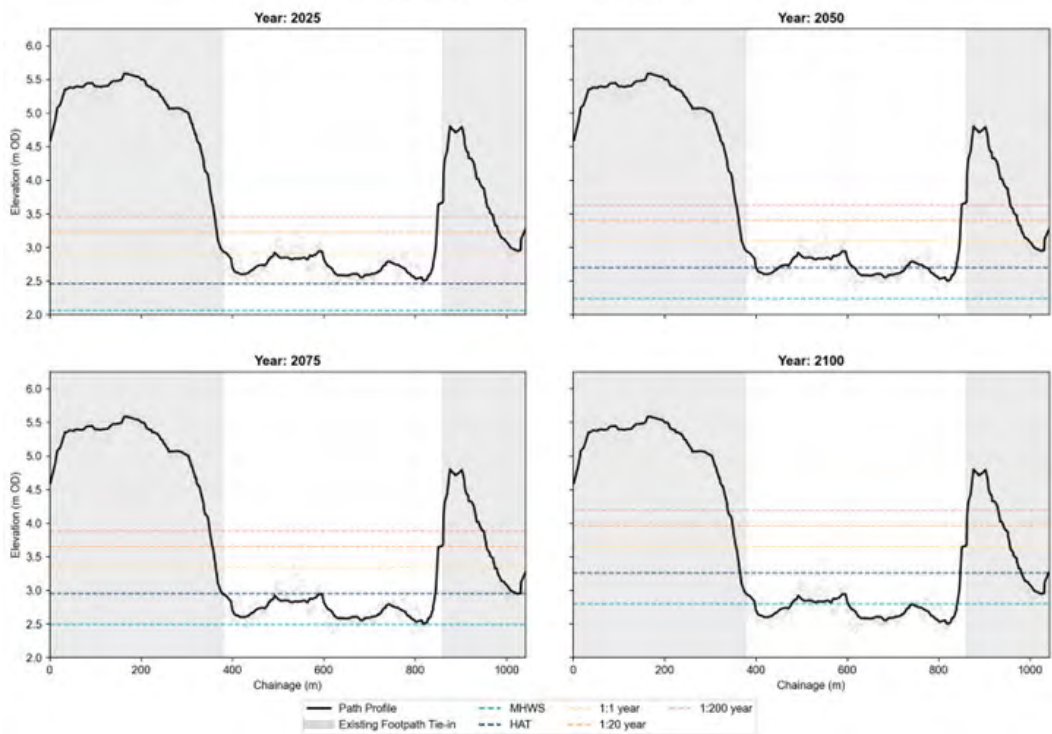


Figure 6.2. Footpath Option 0 route on aerial map and elevation relative to tidal and flood elevations.

### 6.1.1 Current Footpath Maintenance

To keep the footpath in place, regular maintenance would be required, and this would likely only be feasible in the short-term. This would involve tasks such as surface management, coastal erosion control and vegetation clearance. Figure 6.3 shows examples of the repairs that could be considered to maintain the current position of the footpath in the short-term.

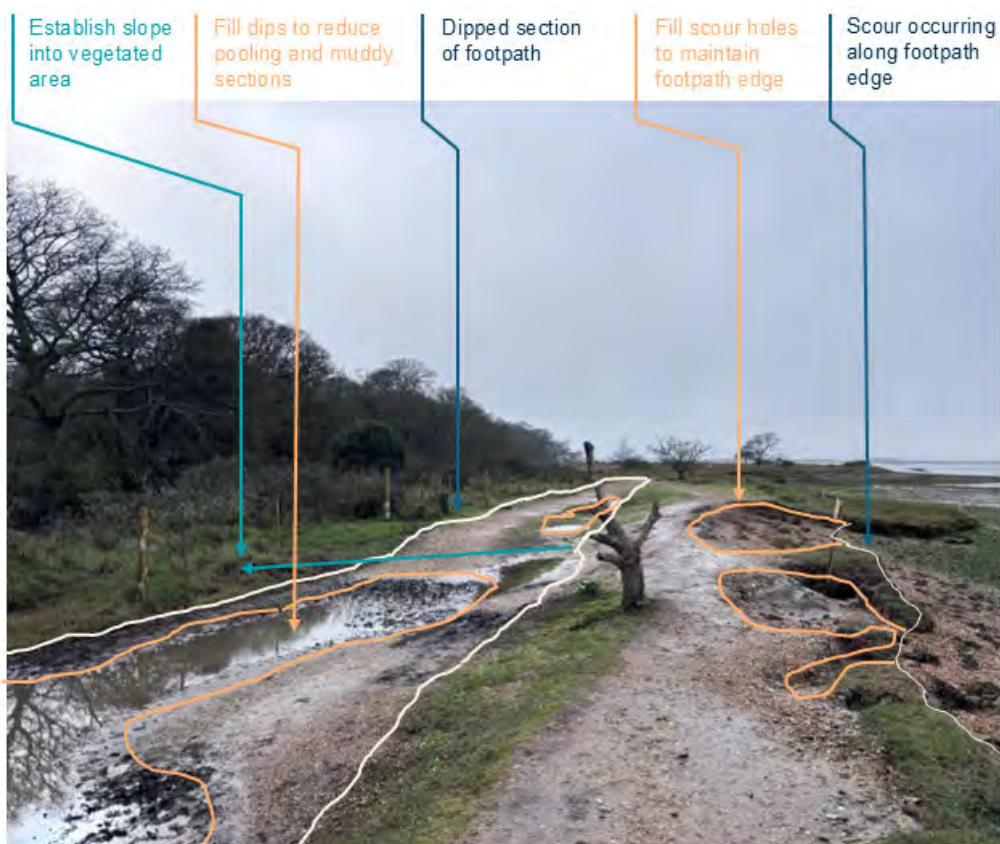


Figure 6.3. Example illustration of repairs that would need to occur along a section of footpath to maintain it in the short-term.

Footpath surface repairs range from £20 to £30 per m<sup>2</sup> according to Paths for All (2023), adjusted for inflation. Erosion control costs are more varied and depend on the foreshore characteristics. Within Figure 6.3 the edge could be left to continue eroding until the path is no longer passable, then the alternative route, as discussed below, could become the primary section of the King Charles III footpath. Licence and consents relating to working in the marine environment (e.g. Marine Licence) will need to be considered and could be challenging to obtain.

## 6.2 Option 1

Option 1 runs along the existing footpath route but looks at raising the footpath above the 1 in 1 year storm elevation for 2100. The route would be partially accessible due to the presence of a footbridge with steps in the western woodland area. The average elevation raise and maximum elevation raise required would be approx 0.62m and 1.54m, respectively. Accounting for a 2m wide footpath the total area required for 1:2 side slopes would be ~5200m<sup>2</sup>. The side slopes would sit directly into the existing saltmarsh habitat, limiting the potential for future roll back and reduce saltmarsh extent in the immediate term. The length of the route would remain the same as Option 0, 1.04km, taking 13-18 minutes to walk. The option is discussed further in Table 6.2. It is unlikely that this option would gain the required licenses and consents, as it would have a detrimental impact on the SSSI and alternative routes are possible. In addition, this option would not be supported by the Chichester Local Plan due to it not complying with Policy P11. The route and elevation section of Option 1 are shown in Figure 6.4. Additionally, a typical section showing how the footpath would be raised is presented in Figure 6.5.

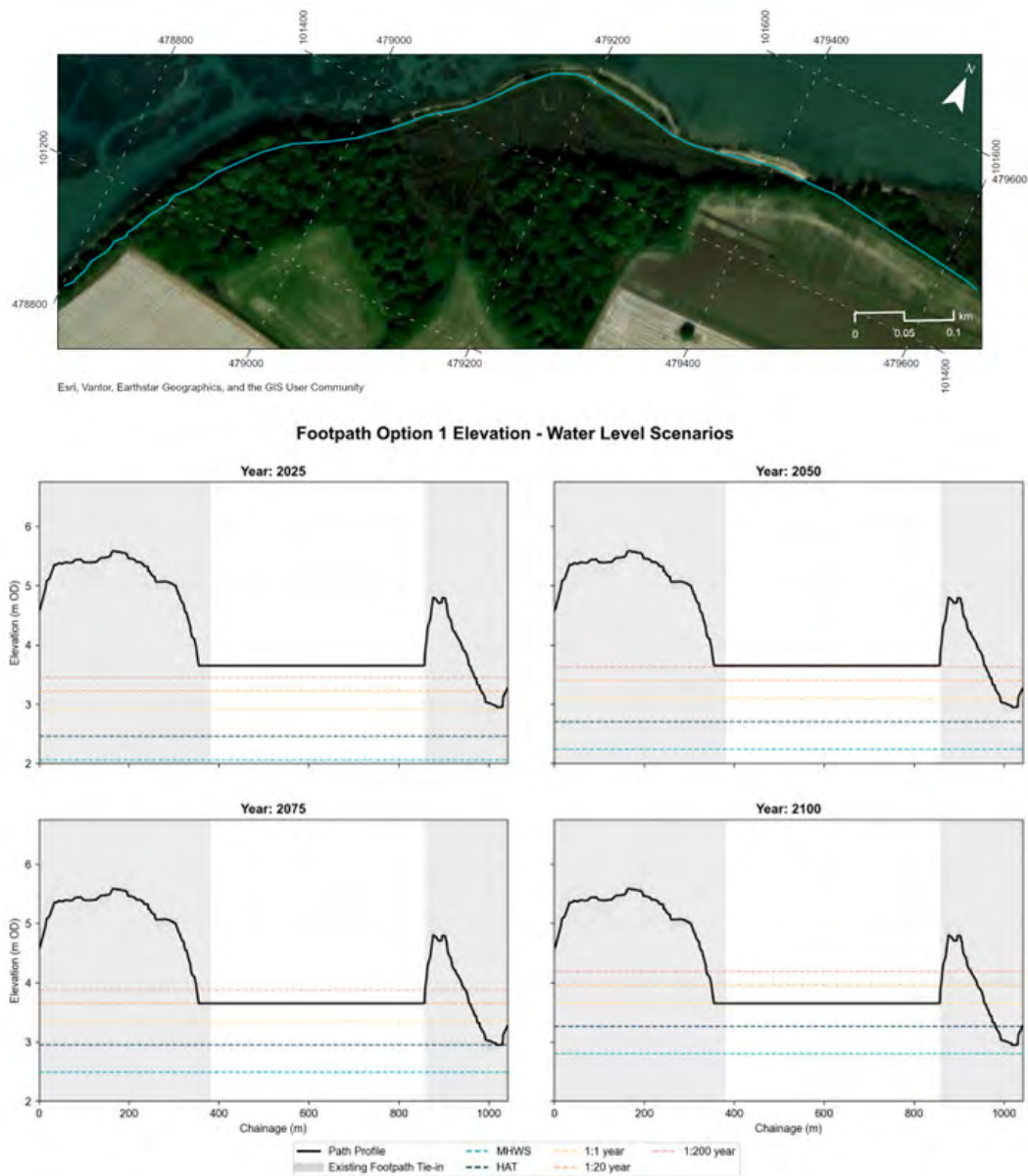


Figure 6.4. Footpath Option 1 route on aerial map and the potential elevation building to the flood elevation for a 1-1 year storm for 2100.

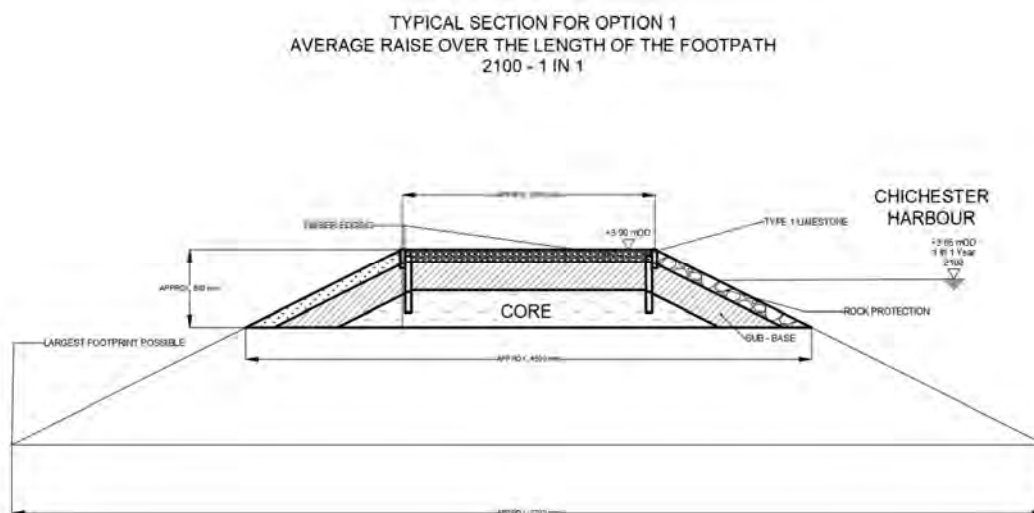


Figure 6.5. Typical section for Option 1.

Table 6.2: Option 1 advantages, disadvantages, constraints and uncertainties relating to technical, environmental and social factors.

Criteria	Advantages	Disadvantages	Constraints	Uncertainties
Technical	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>Challenging to raise footpath along existing extent due to access and within the intertidal area.</li> <li>Significant raising of the footpath required for longevity.</li> <li>Footprint likely to be extensive and larger than existing.</li> <li>Existing outfall would need to be maintained and replaced, and potentially also upgraded in the future to align with sea level rise.</li> </ul>	<ul style="list-style-type: none"> <li>Tidal working.</li> <li>Working in and adjacent to environmental designations.</li> <li>Unknown ground conditions.</li> <li>Access constraints during construction.</li> </ul>	<ul style="list-style-type: none"> <li>Gaining licences and consent from regulators.</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>Partially protects saltmarsh and woodland behind footpath from erosion.</li> </ul>	<ul style="list-style-type: none"> <li>Reduces saltmarsh colonisation area by maintaining, and even increasing, pressure on the existing area due to increased footprint of the new footpath.</li> <li>Prevention of sedimentation could lead to faster transition of saltmarsh to mudflat.</li> <li>Will increase coastal squeeze on intertidal habitat leading to loss of saltmarsh on seaward side of the footpath.</li> </ul>	<ul style="list-style-type: none"> <li>Prevents future saltmarsh habitat growth.</li> <li>Proximity of route to saltmarsh habitat leads to risk of trampling.</li> <li>High BNG impact.</li> </ul>	<ul style="list-style-type: none"> <li>Frequency of storm surges.</li> <li>Impact on existing saltmarsh habitat.</li> </ul>
Social	<ul style="list-style-type: none"> <li>Maintains current footpath views and route.</li> </ul>	<ul style="list-style-type: none"> <li>Partially accessible (existing steps over footbridge?).</li> </ul>	<ul style="list-style-type: none"> <li>Woodland area to the west is not accessible for all users.</li> </ul>	N/A
Economic	<ul style="list-style-type: none"> <li>Cost: Very high</li> </ul>			

### 6.3 Option 2

Option 2 links into the existing path but re-routes the path landward behind existing ancient woodland, measuring approximately 1.32km and taking 16 to 23 minutes to walk (Cronkleton, 2025). While it provides a fully accessible route, the elevation plot indicates that during storm events the path could experience washout or scouring in the immediate timeframe. In addition, this route could be impacted by coastal erosion, cutting through the 2050 NCERM2 buffer (NFI 70<sup>th</sup>). The route also cuts into potential saltmarsh habitat limiting the landward migration as sea levels rise. This route potentially offers the best views of the harbour, for the options running behind the saltmarsh. Furthermore, this option may require screening to protect the privacy of the landowners' fields and depends on securing new access rights. The option is further discussed in Table 6.3 and the route with an elevation section are shown in Figure 6.6.

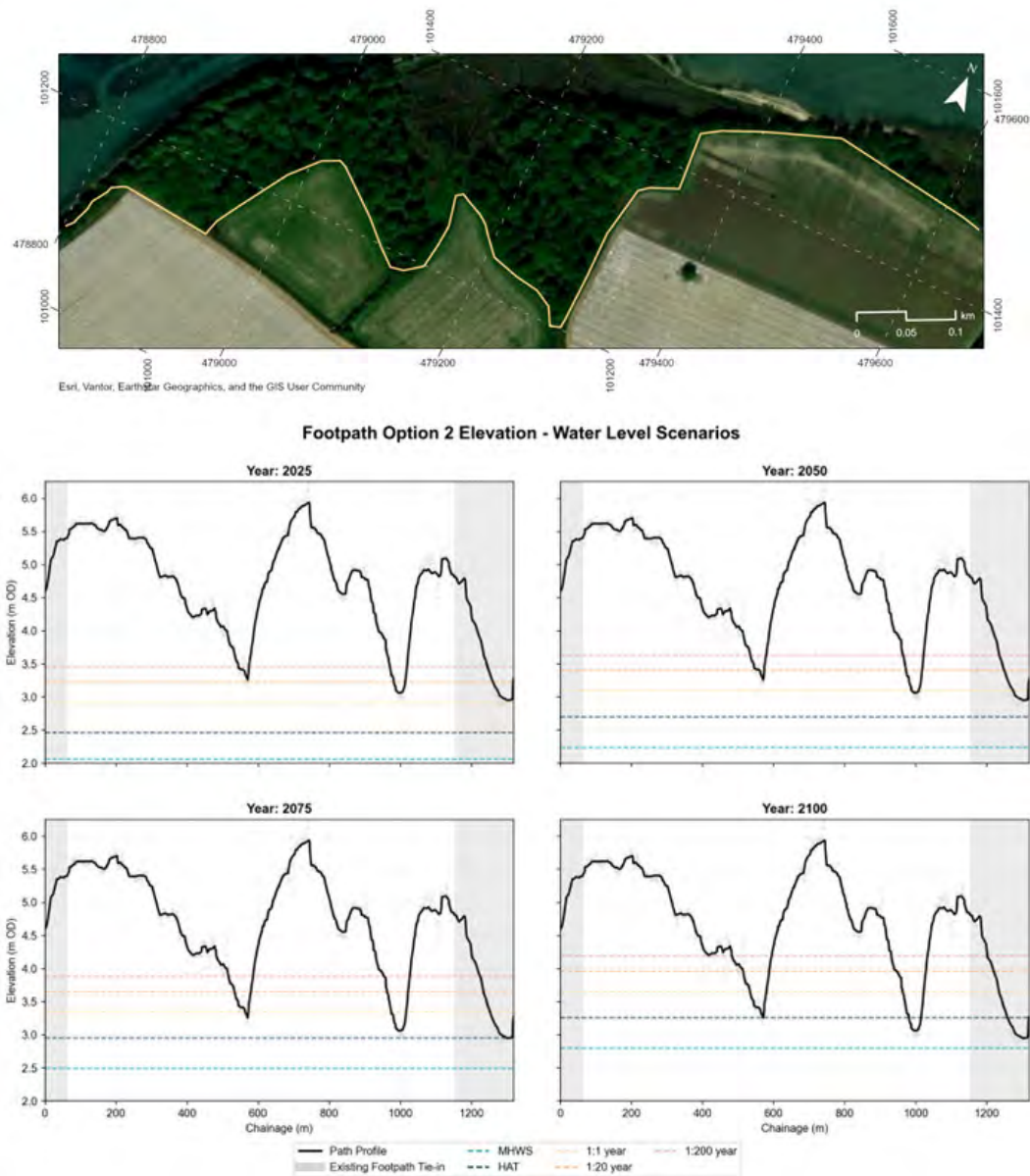


Figure 6.6. Footpath Option 2 route on aerial map and elevation relative to tidal and flood elevations.

Table 6.3 Option 2 advantages, disadvantages, constraints and uncertainties relating to technical, environmental and social factors.

Criteria	Advantages	Disadvantages	Constraints	Uncertainties
Technical	<ul style="list-style-type: none"> <li>• Access for construction favourable.</li> <li>• Minimal excavation required for new footpath surface.</li> <li>• Flexibility, within option, on the route.</li> <li>• Ability to screen footpath with vegetation.</li> <li>• No vegetation clearance required to lay footpath.</li> </ul>	<ul style="list-style-type: none"> <li>• Design would need to consider the likelihood of surface water flooding within the field.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires land owner consent.</li> </ul>	<ul style="list-style-type: none"> <li>• Unknown ground conditions.</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>• Runs along the boundary of the fields behind the woods so would have a low impact on the saltmarsh habitat.</li> <li>• No tree felling would be required.</li> <li>• Screening required on the landward side providing opportunity for meadow or tree planting.</li> <li>• Option allows for the natural deterioration of the existing footpath, which in turn allows for the natural roll back of the foreshore and saltmarsh, promoting habitat growth over time.</li> <li>• Moves the public away from the saltmarsh area and reducing the effects of trampling.</li> </ul>	<ul style="list-style-type: none"> <li>• Storm inundation risk from 1-20 and 1-200 year flood event in 2050 timeframe unless raised.</li> <li>• Scouring of the path could occur as it cuts through the 2050 NCERM2 buffer.</li> </ul>	<ul style="list-style-type: none"> <li>• Minor limitation to saltmarsh habitat growth due to hugging the edge of the fields.</li> </ul>	<ul style="list-style-type: none"> <li>• Effect of screening on landscape character.</li> <li>• Landowner consent.</li> </ul>
Social	<ul style="list-style-type: none"> <li>• Fully accessible depending on the material chosen for the path.</li> <li>• Offers a different experience to the coastal walk for a short section.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced views of the harbour.</li> </ul>	<ul style="list-style-type: none"> <li>• None.</li> </ul>	<ul style="list-style-type: none"> <li>• Proximity to woodlands use for pheasant shooting.</li> </ul>
Economic	<ul style="list-style-type: none"> <li>• Cost: Medium</li> </ul>			

### 6.3.1 Option 2A

Option 2A is a section of Option 2 but avoids two ditches (which Option 2 encounters) by running along the southwest and southeast edge of Field 1. The route measures approximately 1.29km and would take 15 – 23 minutes to walk (Cronkleton, 2025). The route is fully accessible, but the elevation plot indicates that during storm events the path could experience washout or scouring in the immediate timeframe. In addition, this route could be impacted by coastal erosion, cutting through the 2050 NCERM2 buffer (NFI 70<sup>th</sup>). The route also cuts into potential saltmarsh habitat limiting the landward migration as sea levels rise. This route potentially offers the best views of the harbour, for the options running behind the saltmarsh. Furthermore, this option would likely require screening to protect the privacy of the landowners' fields and depends on securing new access rights with the landowner. The option is further discussed in Table 6.4. The route is shown in Figure 6.7 along with an elevation plot along the route.



Esri, Vantor, Earthstar Geographics, and the GIS User Community

Footpath Option 2a Elevation - Water Level Scenarios

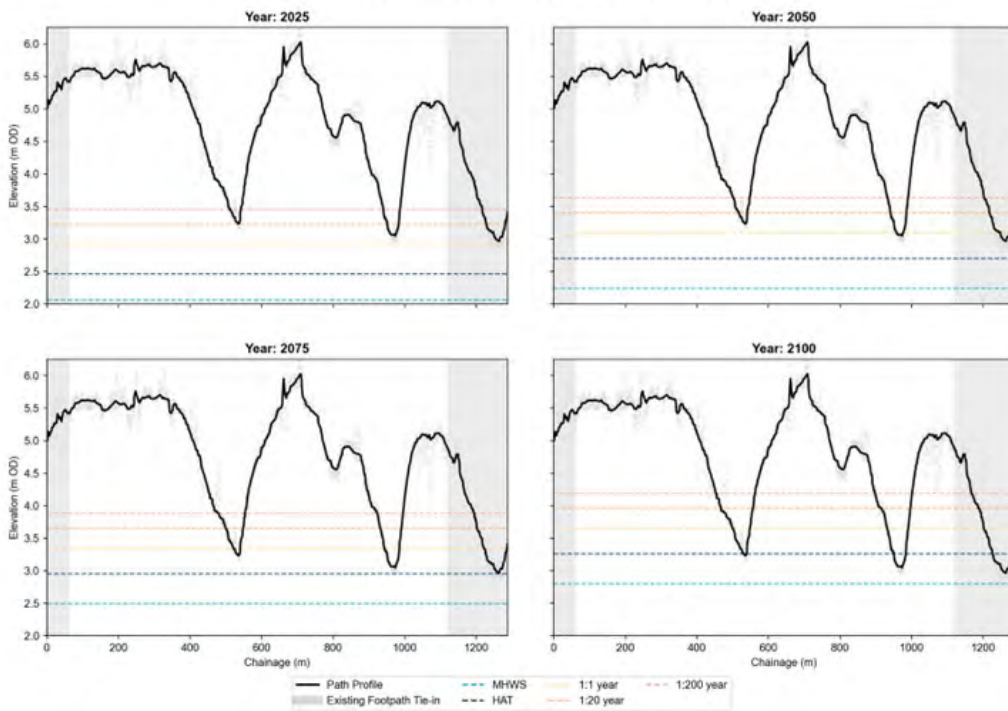


Figure 6.7. Footpath Option 2A route on aerial map and elevation relative to tidal and flood elevations; the blue circle highlights a low area in field 2 that floods in the winter.

Table 6.4: Option 2A advantages, disadvantages, constraints and uncertainties relating to technical, environmental and social factors.

Criteria	Advantages	Disadvantages	Constraints	Uncertainties
Technical	<ul style="list-style-type: none"> <li>• Access for construction favourable.</li> <li>• Minimal excavation required for new footpath surface.</li> <li>• Flexibility, within option, on the route.</li> <li>• Ability to screen footpath with vegetation.</li> <li>• No vegetation clearance required to lay footpath.</li> </ul>	<ul style="list-style-type: none"> <li>• Field 2 gets very wet and could pose challenges with the stability of a footpath in this location.</li> <li>• Required footbridge to cross existing channel drainage ditch?</li> </ul>	<ul style="list-style-type: none"> <li>• Requires landowner consent.</li> </ul>	<ul style="list-style-type: none"> <li>• Unknown ground conditions.</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>• Runs along the boundary of the fields behind the woods so would have a low impact on the saltmarsh habitat.</li> <li>• No tree felling would be required.</li> <li>• Screening required on the landward side providing opportunity for meadow or tree planting.</li> <li>• Option allows for the natural deterioration of the existing footpath, which in turn allows for the natural roll back of the foreshore and saltmarsh, promoting habitat growth over time.</li> <li>• Moves the public away from the saltmarsh area and reducing the effects of trampling.</li> </ul>	<ul style="list-style-type: none"> <li>• Storm inundation risk from 1-20 and 1-200 year flood event in 2050 timeframe unless raised.</li> <li>• Scouring of the path could occur as it cuts through the 2050 NCERM2 buffer.</li> </ul>	<ul style="list-style-type: none"> <li>• Minor limitation to saltmarsh habitat growth due to hugging the edge of the fields.</li> </ul>	<ul style="list-style-type: none"> <li>• Field 2 gets very wet at the northern end of the field where the path would run.</li> <li>• Effect of screening on landscape character.</li> </ul>
Social	<ul style="list-style-type: none"> <li>• Fully accessible depending on the material chosen for the path.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced views of the harbour.</li> </ul>	<ul style="list-style-type: none"> <li>• None.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced proximity to woodlands use for pheasant shooting.</li> </ul>
Economic	<ul style="list-style-type: none"> <li>• Cost: Medium</li> </ul>			

### 6.3.2 Option 2B

Option 2B follows Option 2 but cuts along the outside edge of fields 1 and 2 shown in Figure 6.8 avoiding two ditches which Option 2 encounters. The route measures approximately 1.51km and would take 18-26 minutes to walk (Cronkleton, 2025). The route is fully accessible and while the elevation plot (Figure 6.8) indicates that during storm events the path could experience washout or scouring in the immediate timeframe, less of this route would be impacted than options 2 and 2A. In addition, this route would not be impacted by coastal erosion, as it cuts behind the 2050 NCERM2 buffer (NFI 70<sup>th</sup>). This route offers views of the harbour, which would vary throughout the seasons. Furthermore, this option would likely require screening to protect the privacy of the landowners' fields and depends on securing new access rights. The option is further discussed in Table 6.5.



Esri, Vantor, Earthstar Geographics, and the GIS User Community

**Footpath Option 2b Elevation - Water Level Scenarios**

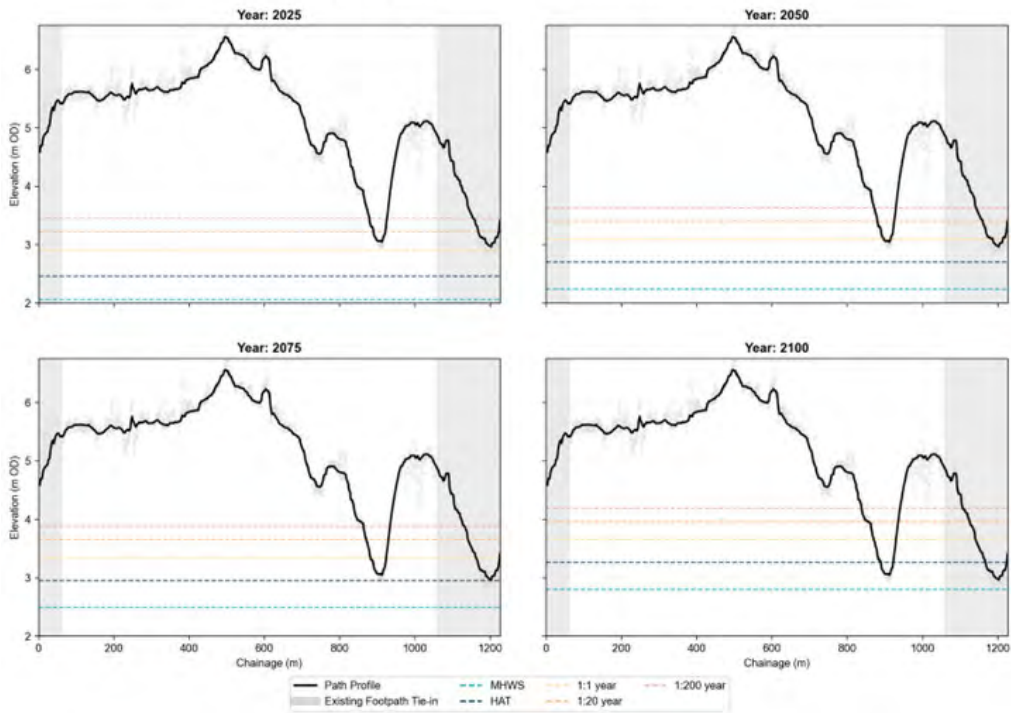


Figure 6.8. Footpath Option 2B route on aerial map and elevation relative to tidal and flood elevations; the blue circle on the aerial image highlights an area in field 2 of lower elevation that floods in the winter.

Table 6.5: Option 2B advantages, disadvantages, constraints and uncertainties relating to technical, environmental and social factors; the field numbers are shown in Figure 6.8.

Criteria	Advantages	Disadvantages	Constraints	Uncertainties
Technical	<ul style="list-style-type: none"> <li>• Access for construction favourable.</li> <li>• Minimal excavation required for new footpath surface.</li> <li>• Flexibility, within option, on the route.</li> <li>• Ability to screen footpath with vegetation.</li> <li>• No vegetation clearance required to lay footpath.</li> <li>• Rough path is present already skirting around the edges of fields 1, 2 and 3.</li> </ul>	<ul style="list-style-type: none"> <li>• Design would need to consider the likelihood of surface water flooding within the field.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires land owner consent.</li> </ul>	<ul style="list-style-type: none"> <li>• Unknown ground conditions.</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>• Runs along the boundary of the fields behind the woods so would have a low impact on the saltmarsh habitat.</li> <li>• No tree felling would be required.</li> <li>• Screening required on the landward side providing opportunity for meadow or tree planting.</li> <li>• Option allows for the natural deterioration of the existing footpath, which in turn allows for the natural roll back of the foreshore and saltmarsh, promoting habitat growth over time.</li> <li>• Moves the public away from the saltmarsh area and reducing the effects of trampling.</li> </ul>	<ul style="list-style-type: none"> <li>• Storm inundation risk from 1-20 and 1-200 year flood event in 2050 timeframe unless raised.</li> <li>• Scouring of the path could occur as it cuts through the 2050 NCERM2 buffer.</li> </ul>	<ul style="list-style-type: none"> <li>• Minor limitation to saltmarsh habitat growth due to hugging the edge of the fields.</li> </ul>	<ul style="list-style-type: none"> <li>• Effect of screening on landscape character.</li> <li>• Landowner consent.</li> </ul>
Social	<ul style="list-style-type: none"> <li>• Fully accessible depending on the material chosen for the path.</li> <li>• Offers a different experience to the coastal walk for a short section.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced views of the harbour.</li> </ul>	<ul style="list-style-type: none"> <li>• None.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced proximity to woodlands use for pheasant shooting.</li> </ul>
Economic	<ul style="list-style-type: none"> <li>• Cost: Medium</li> </ul>			

### 6.4 Option 3

Option 3 is the most conservative and “future-proof” option from a coastal flood and erosion risk perspective, with a length of 1.29km and a walk time between 16 to 23 minutes (Cronkleton, 2025). This option can be fully accessible enabling various user groups to enjoy this section of the footpath. By running along the extent line for a 1 in 200 year storm for 2100, this route remains above all projected water level impacts across the four timeframes (avoiding an area of lower elevation in field 2; Figure 6.8). However, the longevity of the route sacrifices the user experience, albeit along a limited length, as harbour and saltmarsh views would be minimal. This route may also require screening to protect the privacy of the landowner. The option is further discussed in Table 6.6 and the route is show along with an elevation section in Figure 6.9.

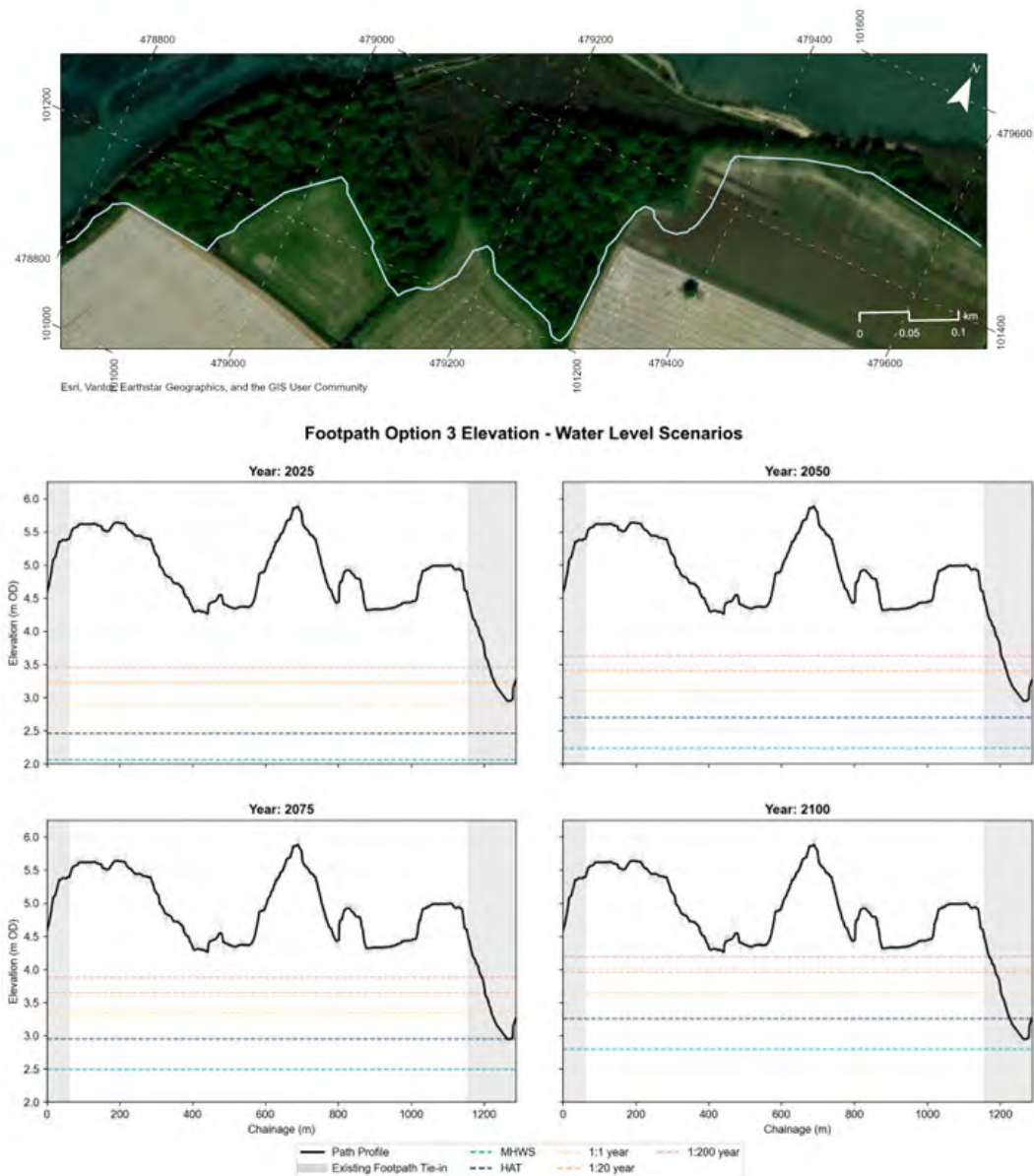


Figure 6.9. Footpath Option 3 route on aerial map and elevation relative to tidal and flood elevations.

Table 6.6: Option 3 advantages, disadvantages, constraints and uncertainties relating to technical, environmental and social factors.

Criteria	Advantages	Disadvantages	Constraints	Uncertainties
Technical	<ul style="list-style-type: none"> <li>• Access for construction favourable.</li> <li>• Minimal excavation required for new footpath surface.</li> <li>• Flexibility, within option, on the route.</li> <li>• Ability to screen footpath with vegetation.</li> <li>• No vegetation clearance required to lay footpath.</li> </ul>	<ul style="list-style-type: none"> <li>• Design would need to consider the likelihood of surface water flooding within the field.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires land owner consent.</li> </ul>	<ul style="list-style-type: none"> <li>• Unknown ground conditions.</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>• Runs along the boundary of the fields behind the woods so would have a low impact on the saltmarsh habitat.</li> <li>• No tree felling would be required.</li> <li>• Screening required on the landward side providing opportunity for meadow or tree planting.</li> <li>• Option allows for the natural deterioration of the existing footpath, which in turn allows for the natural roll back of the foreshore and saltmarsh, promoting habitat growth over time.</li> <li>• Moves the public away from the saltmarsh area and reducing the effects of trampling.</li> <li>• Outside of the predicted erosion zone.</li> </ul>	<ul style="list-style-type: none"> <li>• Storm inundation risk from MHWS flooding by 2100 on tie into existing path (Chainage &gt; 1200m in Figure 6.9) .</li> </ul>	<ul style="list-style-type: none"> <li>• Storm inundation risk from MHWS flooding by 2100 on tie into existing path.</li> </ul>	<ul style="list-style-type: none"> <li>• Effect of screening on landscape character.</li> </ul>
Social	<ul style="list-style-type: none"> <li>• Fully accesible depending on the material chosen for the path.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced view of the harbour.</li> </ul>	<ul style="list-style-type: none"> <li>• None.</li> </ul>	<ul style="list-style-type: none"> <li>• Proximity to woodlands use for pheasant shooting.</li> </ul>
Economic	<ul style="list-style-type: none"> <li>• Cost: Medium</li> </ul>			

## 6.5 Option 4

Option 4 utilises the natural elevation of the woodland area to offer a more sheltered and potentially aesthetically pleasing experience. The elevation plots (Figure 6.10) show high resilience to flooding, though the path cuts through an existing drain of which the impacts are unknown. While this option offers future views of the saltmarsh as the habitat migrates, it is currently limited by partial accessibility due to existing footbridge steps. Additionally, tree cutting would likely be required to carve an accessible path into the landscape. Furthermore, this route is the longest of the 5 options with a length of 1.55km taking 19 to 27 minutes to walk (Cronkleton, 2025). The option is further discussed within Table 6.7.

Cutting through the woodland would require a tree survey to determine whether an accessible pathway could be laid without removing or impacting any of the trees. Securing consent on this route would be challenging if tree felling was required due the Commitment 11 from the EIP, which aims to increase England's tree canopy and woodland cover.

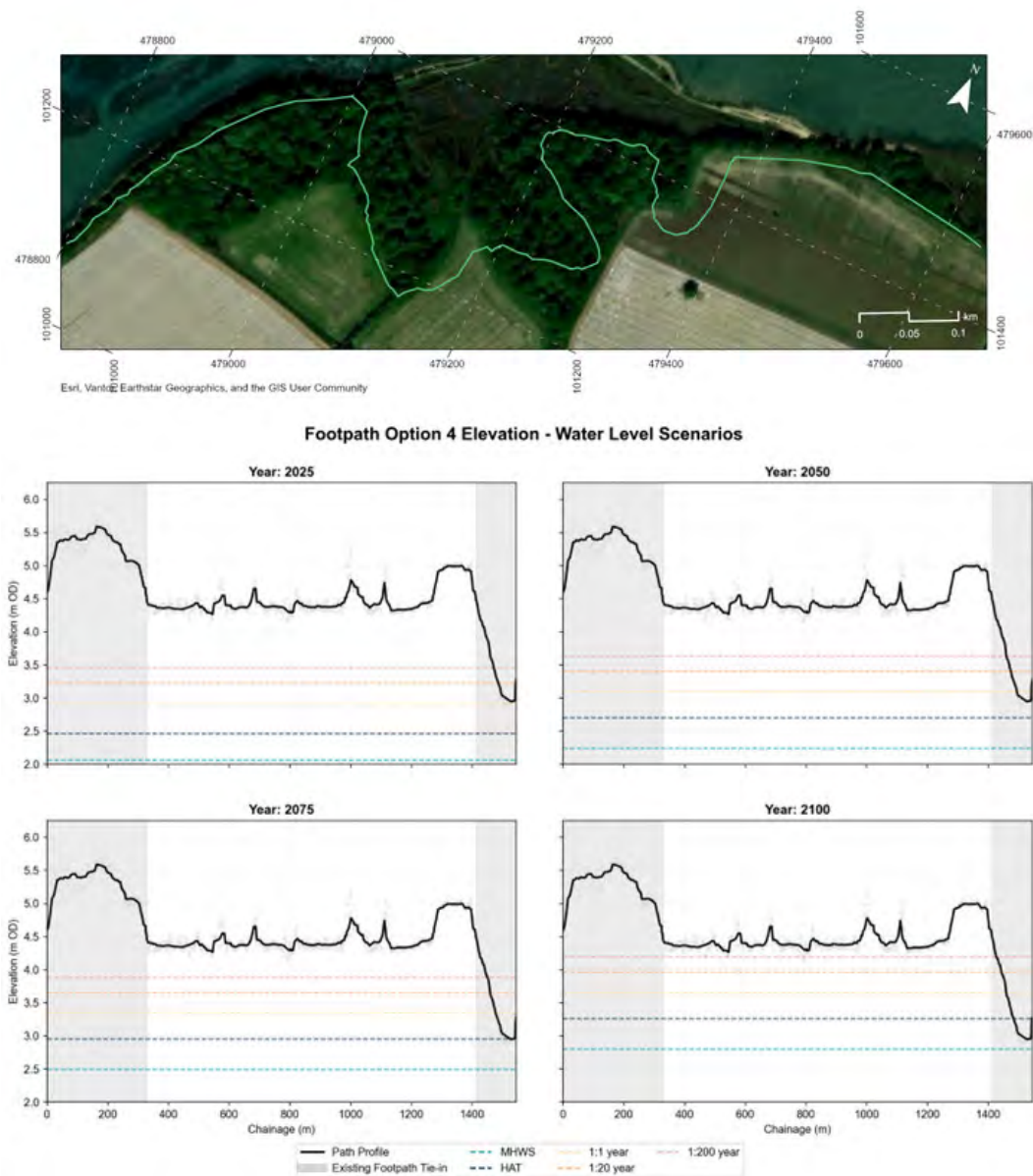


Figure 6.10. Footpath Option 4 route on aerial map and elevation relative to tidal and flood elevations.

Table 6.7: Option 4 advantages, disadvantages, constraints and uncertainties relating to technical, environmental and social factors.

Criteria	Advantages	Disadvantages	Constraints	Uncertainties
Technical	<ul style="list-style-type: none"> <li>• Access for construction partially favourable, with routes within woodland difficult.</li> <li>• Significant vegetation clearance required to lay footpath.</li> </ul>	<ul style="list-style-type: none"> <li>• Runs over a drain so would require a footbridge to be constructed.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires landowner consent.</li> </ul>	<ul style="list-style-type: none"> <li>• Unknown ground conditions.</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>• Partial screening required providing opportunity for meadow or tree planting.</li> <li>• The route runs landward of the 1-200 year storm extent for 2100.</li> </ul>	<ul style="list-style-type: none"> <li>• Scouring of the path could occur as it cuts through the 2050 NCERM2 buffer.</li> <li>• Tree felling required.</li> <li>• Existing drain on map which route runs through.</li> <li>• Runs partially along the rear of the marsh, partially limiting saltmarsh habitat growth potential.</li> </ul>	<ul style="list-style-type: none"> <li>• Likely high BNG impacts through woodland.</li> </ul>	<ul style="list-style-type: none"> <li>• Effect of screening on landscape character.</li> <li>• Consenting for tree felling due to Commitment 11 of the EIP.</li> <li>•</li> </ul>
Social	<ul style="list-style-type: none"> <li>• Pleasant woodland experience.</li> <li>• Potential of future views of saltmarsh habitat.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced views of the harbour.</li> <li>• Partially accessible due to path tying into existing footpath with uneven terrain and footbridge with steps.</li> </ul>	<ul style="list-style-type: none"> <li>• Woodland area is not fully accessible for all users.</li> </ul>	<ul style="list-style-type: none"> <li>• Proximity to woodlands use for pheasant shooting.</li> </ul>
Economic	<ul style="list-style-type: none"> <li>• Cost: Medium</li> </ul>			

## 6.6 Option 5

Option 5 prioritises the woodland environment but does not achieve the same level of protection to future coastal flooding as other options. The route would require tree felling to lay an accessible path through the woodland and would only be partially accessible due to steps for a footbridge in an existing section of footpath to which it would link. Furthermore, depending on the condition and reliance on an existing drain, management options would have to be considered. This route would likely offer good views of future saltmarsh habitat while not limiting saltmarsh habitat growth, with the route shown in Figure 6.11. This route is one of the longer options with a length of 1.51km, taking 18 to 26 minutes to walk (Cronkleton, 2025). This option is further discussed within Table 6.8.

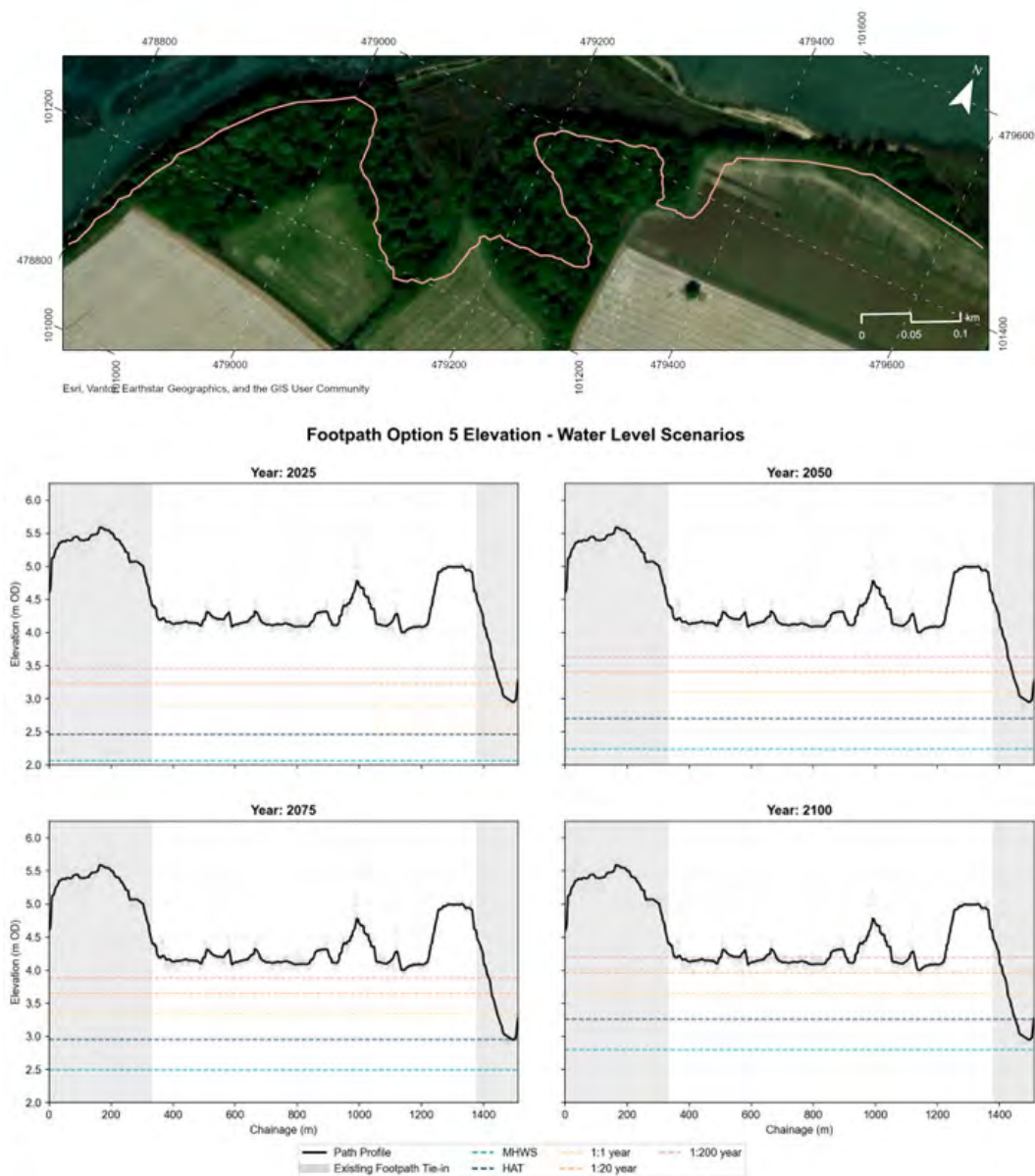


Figure 6.11. Footpath Option 5 route on aerial map and elevation relative to tidal and flood elevations.

Table 6.8: Option 5 advantages, disadvantages, constraints and uncertainties relating to technical, environmental and social factors.

Criteria	Advantages	Disadvantages	Constraints	Uncertainties
Technical	<ul style="list-style-type: none"> <li>Access for construction partially favourable, with routes within woodland difficult.</li> <li>Significant vegetation clearance required to lay footpath.</li> </ul>	<ul style="list-style-type: none"> <li>Runs over a drain so would require a footbridge to be constructed.</li> </ul>	<ul style="list-style-type: none"> <li>Requires landowner consent.</li> </ul>	<ul style="list-style-type: none"> <li>Unknown ground conditions.</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>Partial screening required providing opportunity for meadow or tree planting.</li> <li>The route runs landward of the 1-20 year storm extent for 2100.</li> <li>Route runs outside of the opportunity zones for saltmarsh creation.</li> </ul>	<ul style="list-style-type: none"> <li>Storm inundation risk from MHWS flooding by 2100 on tie into existing path.</li> <li>Tree felling required.</li> <li>Existing drain on map which route runs through.</li> </ul>	<ul style="list-style-type: none"> <li>Likley high BNG impacts through woodland.</li> </ul>	<ul style="list-style-type: none"> <li>Effect of screening on landscape character.</li> <li>Consenting for tree felling due to Commitment 11 of the EIP.</li> </ul>
Social	<ul style="list-style-type: none"> <li>Pleasant woodland experience.</li> <li>Potential of future views of saltmarsh habitat.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced views of the harbour.</li> <li>Partially accessible due to path tying into existing footpath with uneven terrain and footbridge with steps.</li> </ul>	<ul style="list-style-type: none"> <li>Woodland area is not fully accessible for all users.</li> </ul>	<ul style="list-style-type: none"> <li>Proximity to woodlands use for pheasant shooting.</li> </ul>
Economic	<ul style="list-style-type: none"> <li>Cost: Medium</li> </ul>			

## 7 Recommended Option

Option 2 is the preferred option for a new sustainable future route, with options 2A and 2B included as sub options; the routes for these options are shown in Figure 7.1. The route would tie into the existing footpath on the western edge of the project area and the path that leads into West Itchenor. The route would be fully accessible, enabling users with reduced mobility to enjoy the footpath and supporting the use of wheelchairs, pushchairs and buggies. The route provides opportunities for coastal views which are identified in Figure 7.1.



Figure 7.1. Footpath route for options 2, 2A and 2B with vistas identified on the map with photos and locations for illustrations shown below.

Some illustration of what this footpath option could look like were generated using AI; Figure 7.2 to Figure 7.5 show what the footpath could feel like.



*Figure 7.2. Illustration of footpath generated using AI; the view is from location 1 shown in Figure 7.1.*



*Figure 7.3. Illustration of footpath generated using AI; the view is from location 2 shown in Figure 7.1.*



*Figure 7.4. Illustration of footpath generated using AI; the view is from location 3 shown in Figure 7.1.*



*Figure 7.5. Illustration of footpath generated using AI; the view is from location 4 shown in Figure 7.1.*

## 7.1 Re-use of Concrete Sleepers

If the concrete sleepers were removed from the existing footpath this would create an opportunity to re-use a part of the original path in the re-routing. Four ideas for re-using the sleepers were developed, with the advantages and disadvantages of each presented in Table 7.1.

Table 7.1: Options for re-using concrete sleepers.

Re-Use Option	Advantages	Disadvantages
Crushing sleepers and using for path surfacing	<ul style="list-style-type: none"> <li>Provides durable, angular material for excellent compaction.</li> <li>Reduces need for imported aggregate.</li> </ul>	<ul style="list-style-type: none"> <li>Crushing requires heavy machinery with potentially high cost.</li> <li>Reinforcing steel must be removed.</li> </ul>
Use as edging along the path	<ul style="list-style-type: none"> <li>Very strong and long-lasting.</li> <li>Helps contain gravel surfacing.</li> <li>Visual boundary helps users stay on the path.</li> </ul>	<ul style="list-style-type: none"> <li>Heavy to install; would require machinery.</li> <li>Must ensure top edges are not trip hazards.</li> </ul>
Use as buried sub-base reinforcement under soft ground	<ul style="list-style-type: none"> <li>Spreads load over boggy estuary soils.</li> <li>Reduces rutting and maintenance.</li> <li>Ideal for sections that repeatedly flood.</li> </ul>	<ul style="list-style-type: none"> <li>Labour-intensive to position correctly.</li> <li>May create uneven settlement if not compacted well.</li> </ul>
Benches or seating blocks	<ul style="list-style-type: none"> <li>Low-maintenance seating option.</li> <li>Very robust.</li> </ul>	<ul style="list-style-type: none"> <li>Limited comfort.</li> <li>Requires trimming ends or smoothing surfaces.</li> <li>Cost to make into seating.</li> </ul>

## 8 References

AECOM. (2019). *Spon's Civil Engineering and Highway Works Price Book* (33rd digital ed.). Taylor & Francis.

Ali, M. & Dixon, M. (2026). *Chemical Analysis of Chalkdock Reinforced Concrete Sleepers*. University of Portsmouth.

Allen, J. (2000). Morphodynamics of Holocene salt marshes: A review sketch from the Atlantic and Southern North Sea coasts of Europe. *Quaternary Science Reviews*, 19(12).  
[https://doi.org/10.1016/S0277-3791\(99\)00034-7](https://doi.org/10.1016/S0277-3791(99)00034-7)

Bardsley, L., Brooksbank, J., Giacomelli, A., Marlow, A. & Webster, E. (2021). *Condition review of Chichester Harbour sites: intertidal, subtidal and bird features* (Report No. NERR090). Natural England.  
<https://www.conservancy.c.uk/wp-content/uploads/Chichesters-Harbour-Condition-Review.pdf>

Chichester Harbour Conservancy. (2026). *Saltmarsh Restoration Trial – West Itchenor*. Chichester Harbour Conservancy. <https://www.conservancy.co.uk/nature-recovery/projects/saltmarsh-restoration-trial-project-west-itchenor/>

Cope, S.N., Bradbury, A.P. and Gorczynska, M. (2008). *Solent Dynamic Coast Project: Main report*. Channel Coastal Observatory. [https://northsolentsmp.co.uk/media/1968/TR011-2008-SDCP-Main-1/pdf/TR011\\_2008\\_SDCP\\_Main\\_1.pdf?m=1616409152670](https://northsolentsmp.co.uk/media/1968/TR011-2008-SDCP-Main-1/pdf/TR011_2008_SDCP_Main_1.pdf?m=1616409152670)

Cronkleton, E. (2025) *What Is the Average Walking Speed of an Adult?*. Healthline.  
<https://www.healthline.com/health/exercise-fitness/average-walking-speed#average-speed-by-age>

Department for Environment, Food & Rural Affairs (Defra). (2018). *A Green Future: Our 25 Year Plan to Improve the Environment*. Defra.  
<https://assets.publishing.service.gov.uk/media/5ab3a67840f0b65bb584297e/25-year-environment-plan.pdf>



Department for Environment, Food & Rural Affairs (Defra). (2025). *Environmental Improvement Plan 2025*. Defra.

[https://assets.publishing.service.gov.uk/media/692d8d9cce50d215cae962a5/Environmental\\_Improvement\\_Plan\\_\\_EIP\\_\\_2025.pdf](https://assets.publishing.service.gov.uk/media/692d8d9cce50d215cae962a5/Environmental_Improvement_Plan__EIP__2025.pdf)

Department for Environment, Food & Rural Affairs. (2025) *Biodiversity net gain*. GOV.UK.

<https://www.gov.uk/government/collections/biodiversity-net-gain>

Environment Agency. (2020). *Addendum to Appendix K - North Solent Shoreline Management Plan*.

Environment Agency. [https://environment.data.gov.uk/shoreline-planning/documents/SMP13%2FNorth\\_Solent\\_SMP\\_SEA\\_Addendum.pdf](https://environment.data.gov.uk/shoreline-planning/documents/SMP13%2FNorth_Solent_SMP_SEA_Addendum.pdf)

Jacobs & Royal HaskoningDHV. (2020). *Shoreline Management Plans – Supplementary guidance for their ongoing maintenance and delivery*. Environment Agency. <https://environment.data.gov.uk/shoreline-planning/documents/Shoreline%20Management%20Plan%20Supplementary%20Guidance%202023.pdf>

Natural England. (2014). *National Character Area Profile: 126. South Coast Plain*. Natural England.

<https://publications.naturalengland.org.uk/file/5611419550613504>

Paths for All. (2023). *Estimating price guide for path projects*. [https://walkingscotland.org.uk/wp-content/uploads/2025/05/estimating-price-guide-for-path-projects\\_paths-for-all\\_-rev4-march-2023-1.pdf](https://walkingscotland.org.uk/wp-content/uploads/2025/05/estimating-price-guide-for-path-projects_paths-for-all_-rev4-march-2023-1.pdf)

UK Centre for Ecology & Hydrology. (2023). *Saltmarshes – Factsheet*. UK Centre for Ecology & Hydrology. <https://www.ceh.ac.uk/sites/default/files/2023-10/Saltmarsh-factsheet-Oct2023.pdf>

United Kingdom Hydrographic Office. (2025). *Admiralty Tide Tables* (Vol. NP201A-25). Taunton, UK: UKHO.

U.S. Fish and Wildlife Service. (2023). *Why Healthy Wetlands Are Vital to Protecting Endangered Species*. U.S. Fish & Wildlife. <https://www.fws.gov/story/2023-04/why-healthy-wetlands-are-vital-protecting-endangered-species>

## 8.1 Data Sources

Environment Agency. (2019). Coastal Design Sea Levels (2018) bundle.

<https://environment.data.gov.uk/dataset/6e856bda-0ca9-404f-93d7-566a2378a7a8>

Forestry Commission. (2023). *Woodland Grant Scheme 3 England*. [https://data-forestry.opendata.arcgis.com/datasets/f4a903e1682347ca9f3a867393bb751c\\_0/about](https://data-forestry.opendata.arcgis.com/datasets/f4a903e1682347ca9f3a867393bb751c_0/about)

Environment Agency. (2025). Saltmarsh Change. <https://www.data.gov.uk/dataset/2d5d8f23-3582-491b-aae4-c987ffabb910/saltmarsh-change>

Environment Agency. (2025a). Saltmarsh Extent & Zonation.

<https://environment.data.gov.uk/dataset/6da82900-d465-11e4-8cc3-f0def148f590>

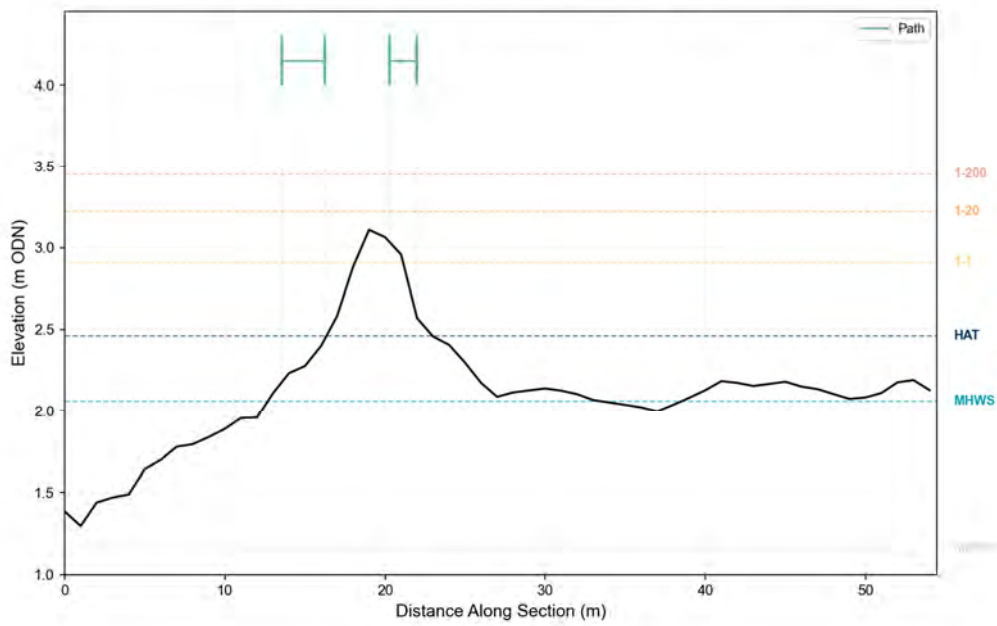
Environment Agency. (2025b). *Saltmarsh Habitat Map*. <https://www.data.gov.uk/dataset/cd882fcd-47a3-4d0f-a92b-25f9ac894a3e/saltmarsh-habitat-map>

## Appendix

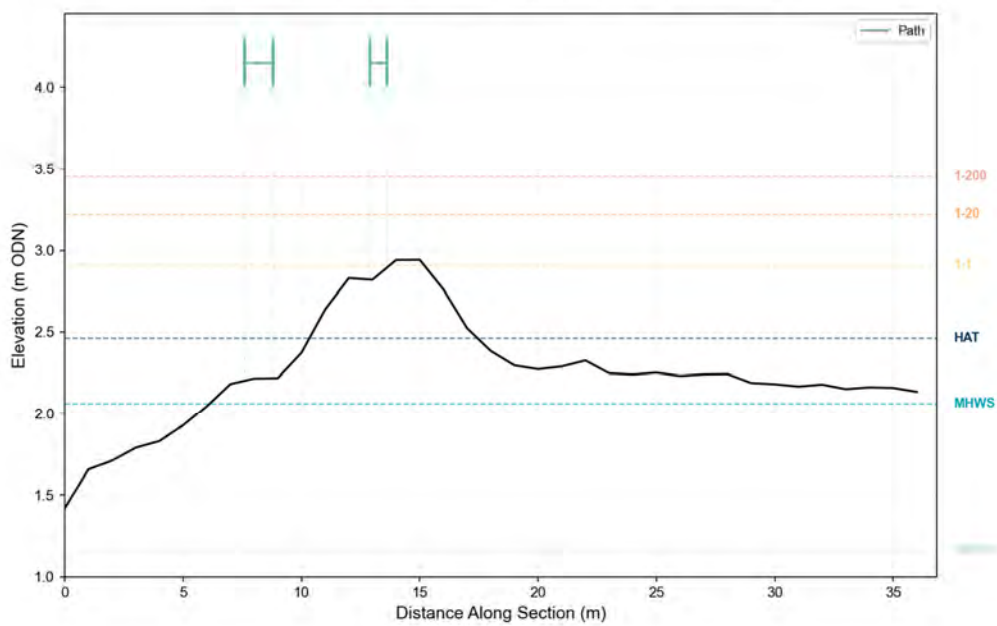
### A1 Additional Elevation Sections of the Footpath

#### A1.1 2025

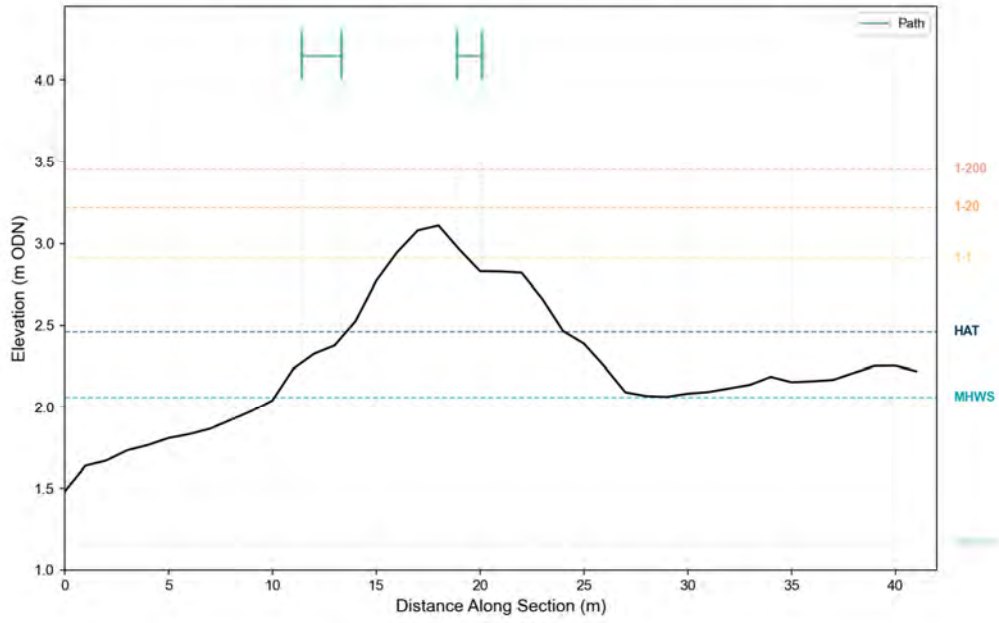
Elevation Profile with Present Day Water Levels: Section S\_1



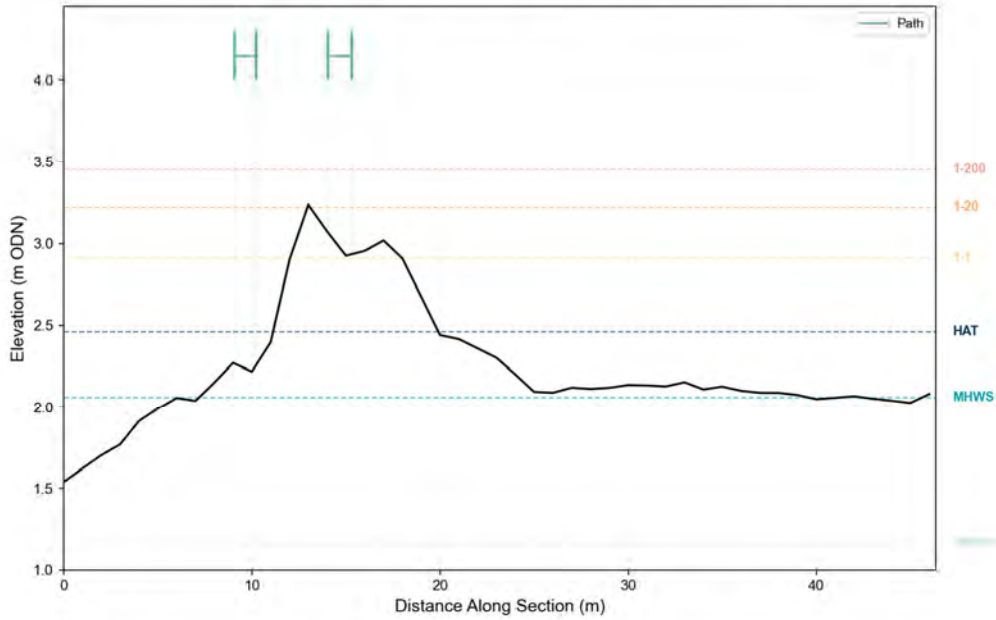
Elevation Profile with Present Day Water Levels: Section S\_2



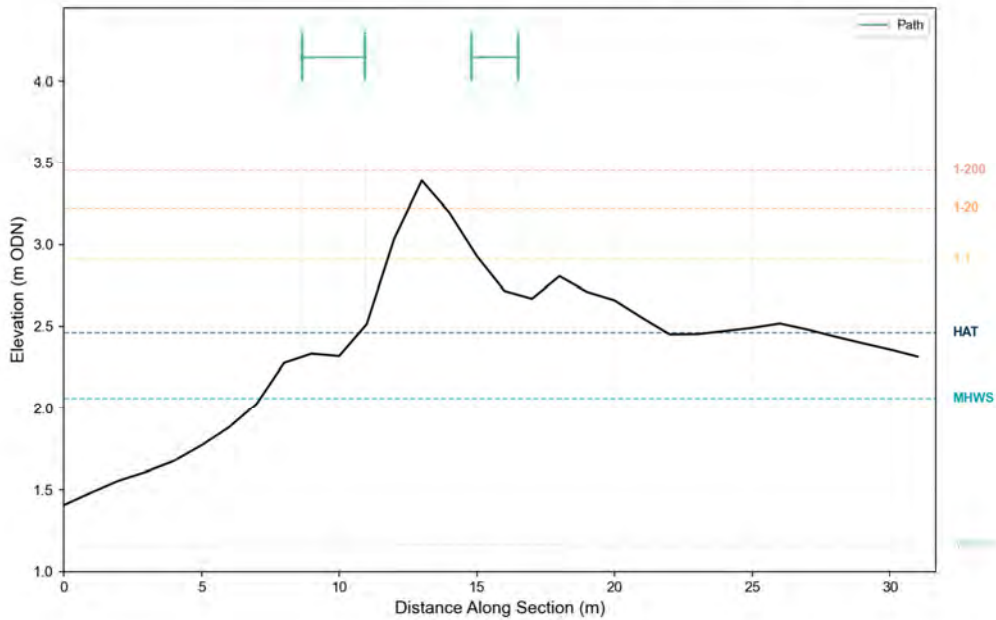
Elevation Profile with Present Day Water Levels: Section S\_3



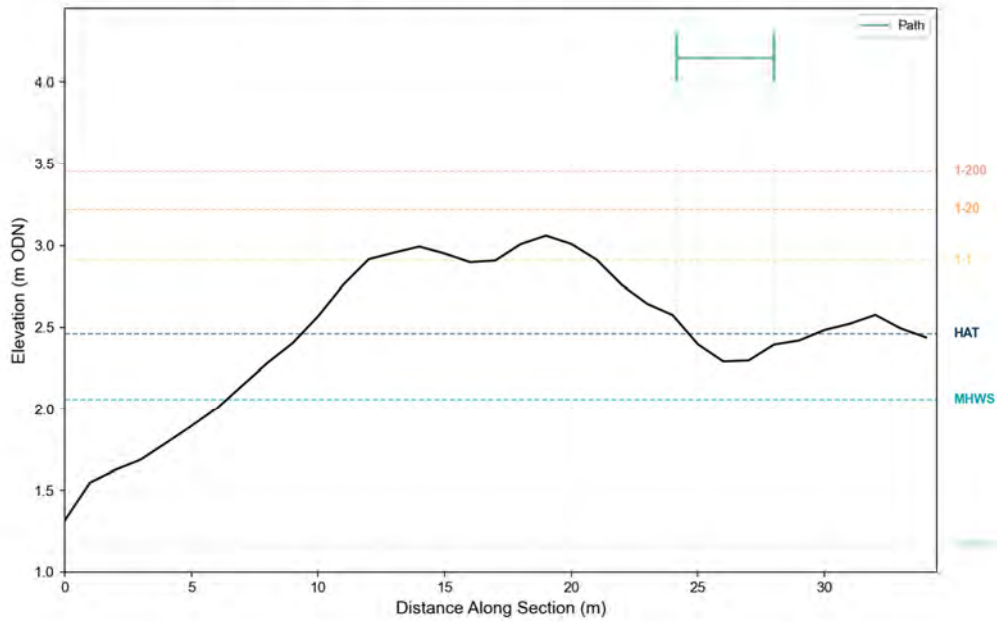
Elevation Profile with Present Day Water Levels: Section S\_4



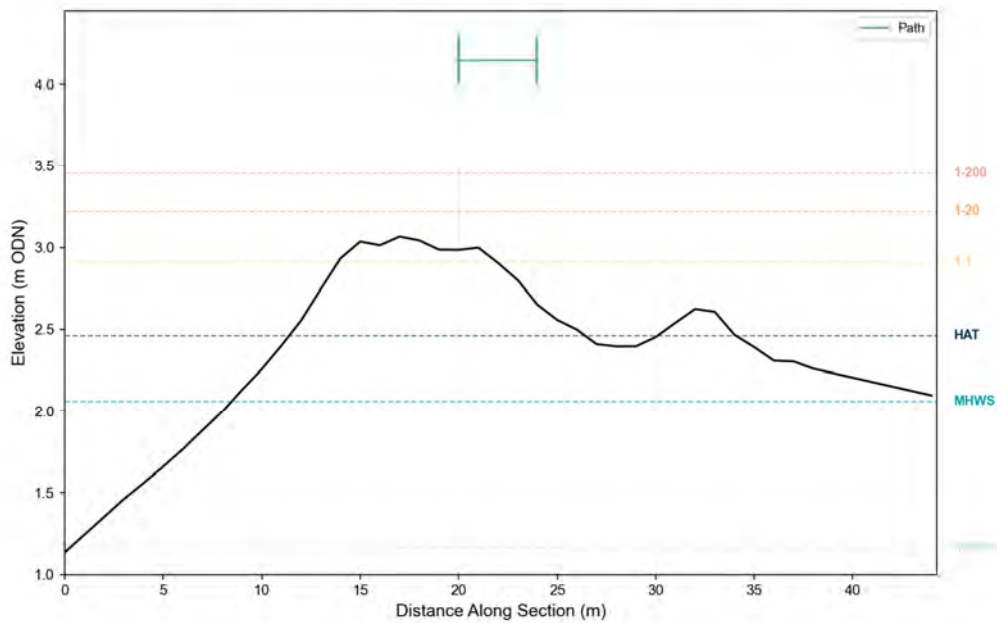
Elevation Profile with Present Day Water Levels: Section S\_5



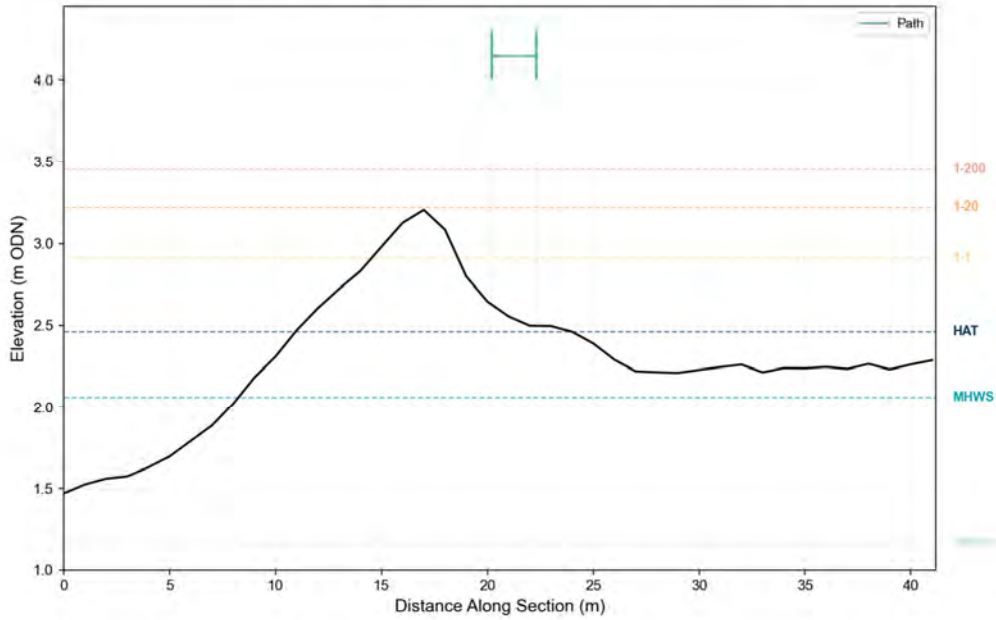
Elevation Profile with Present Day Water Levels: Section S\_6



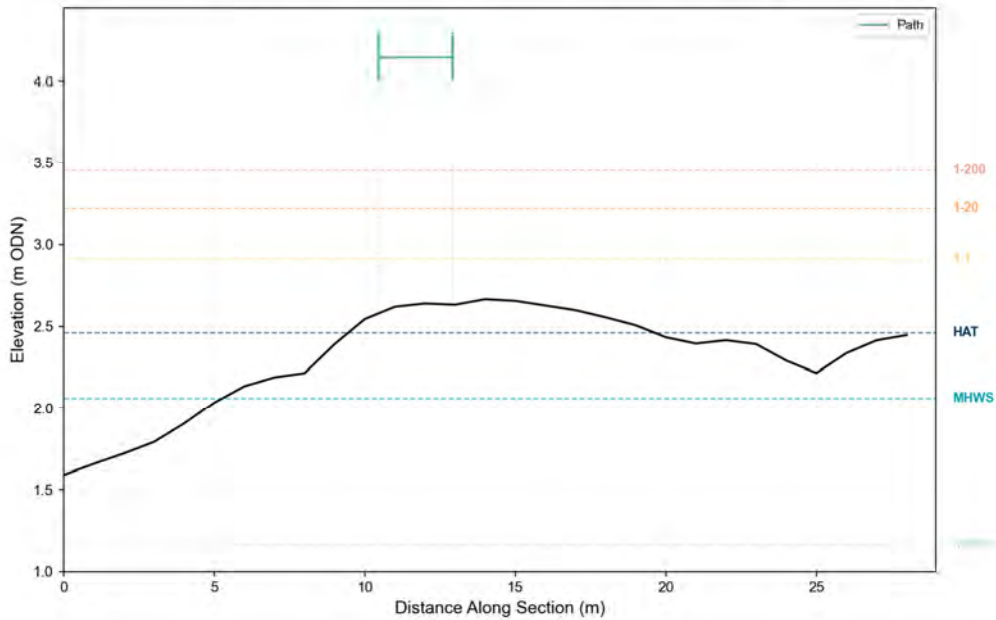
Elevation Profile with Present Day Water Levels: Section S\_7



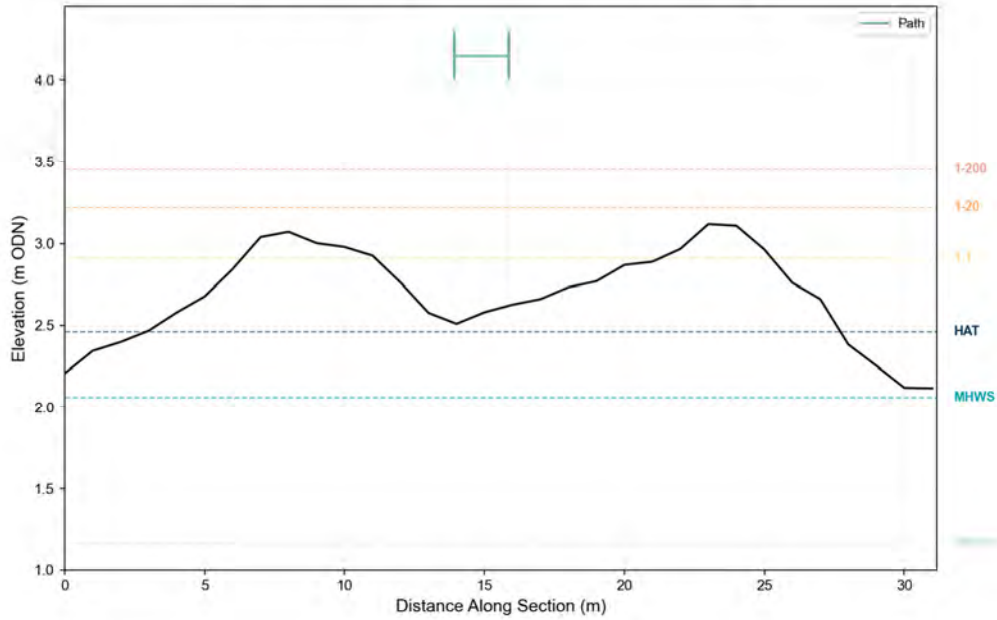
Elevation Profile with Present Day Water Levels: Section S\_8



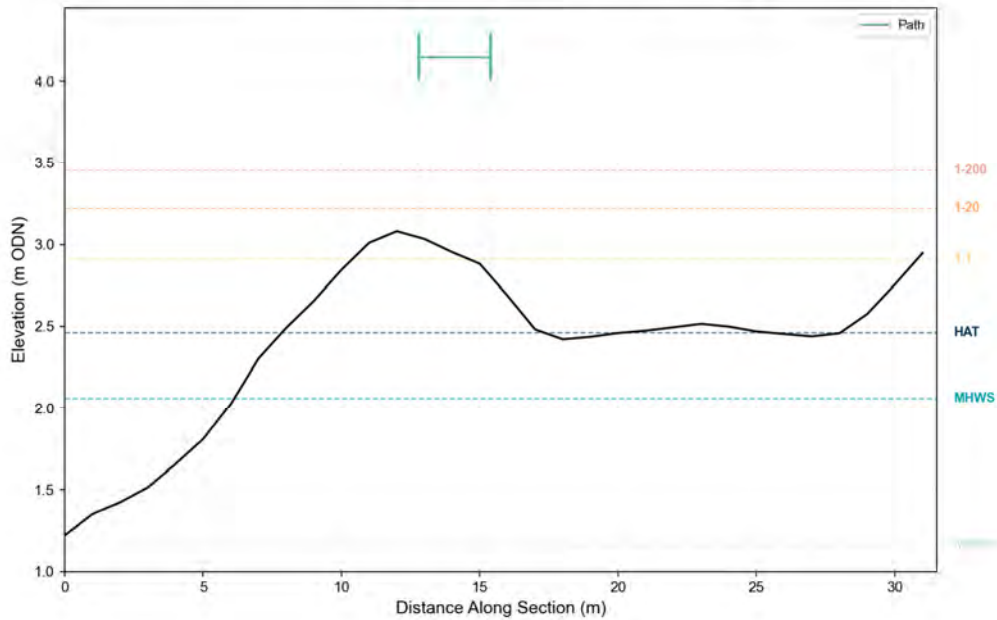
Elevation Profile with Present Day Water Levels: Section S\_9



Elevation Profile with Present Day Water Levels: Section S\_10

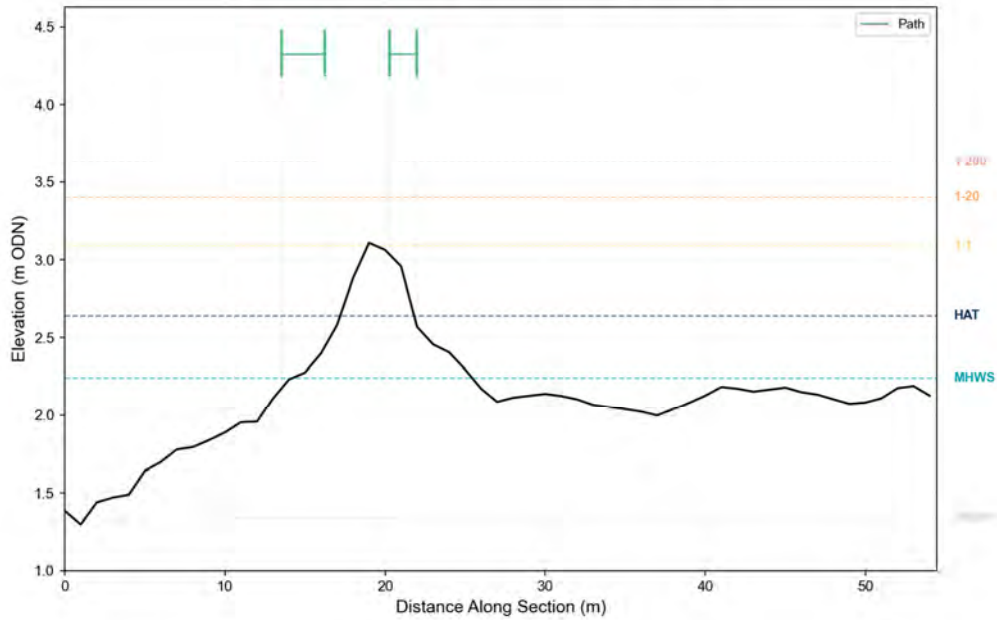


Elevation Profile with Present Day Water Levels: Section S\_11

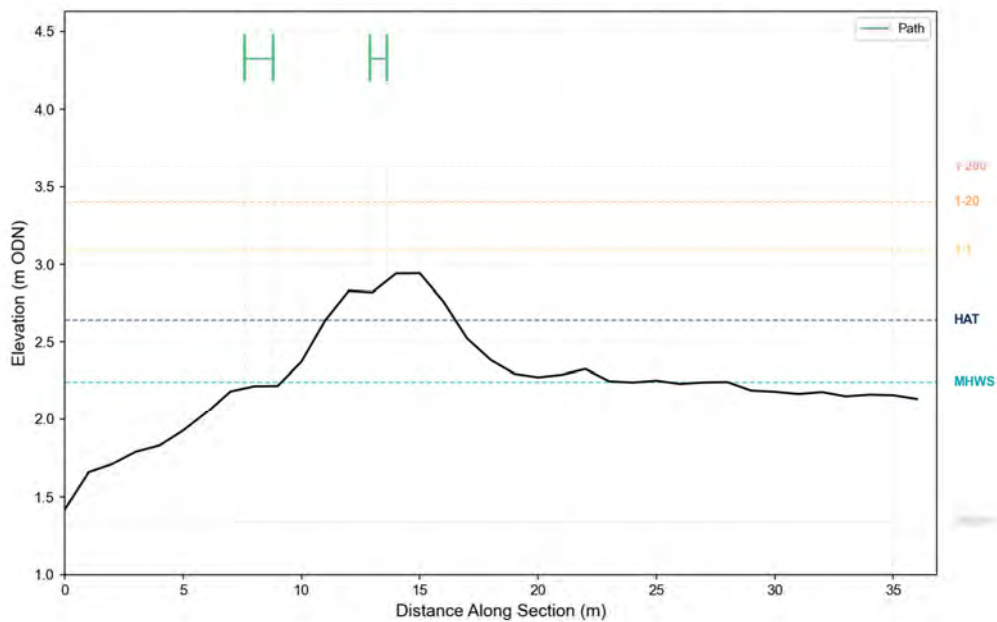


### A1.2 2050

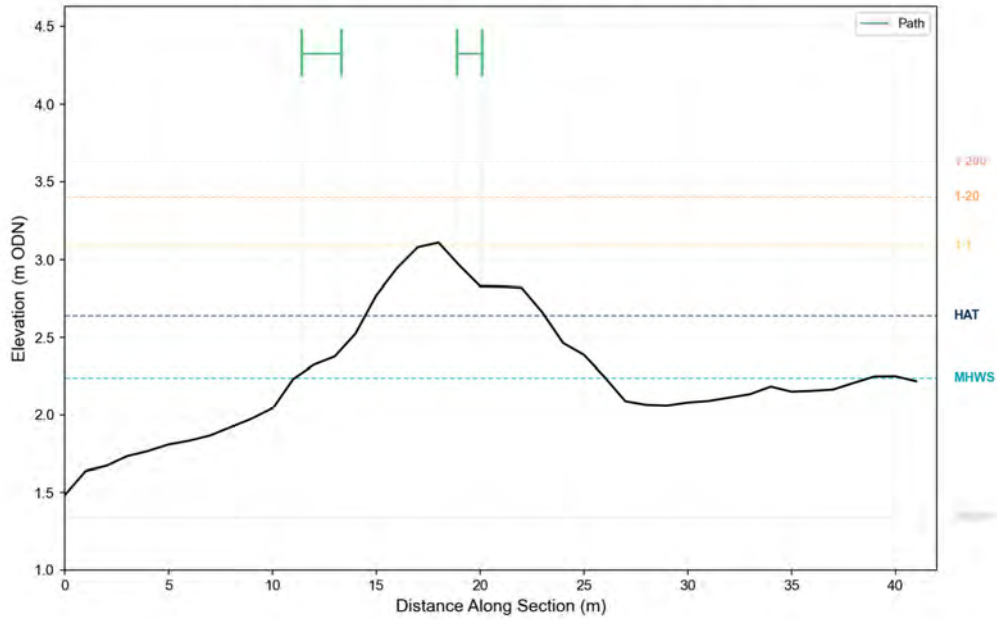
Elevation Profile with 2050 Water Levels: Section S\_1



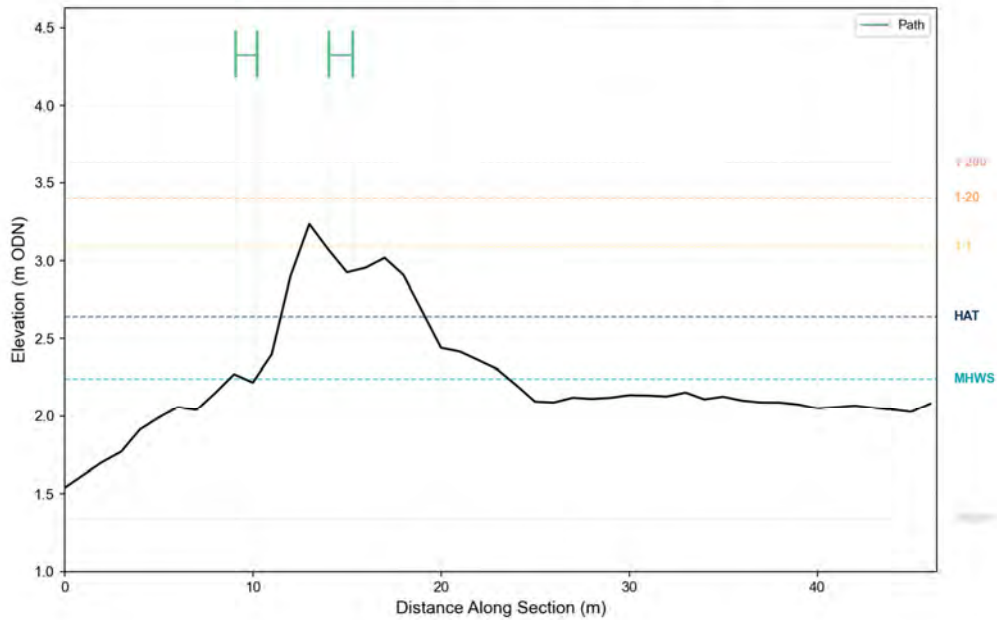
Elevation Profile with 2050 Water Levels: Section S\_2



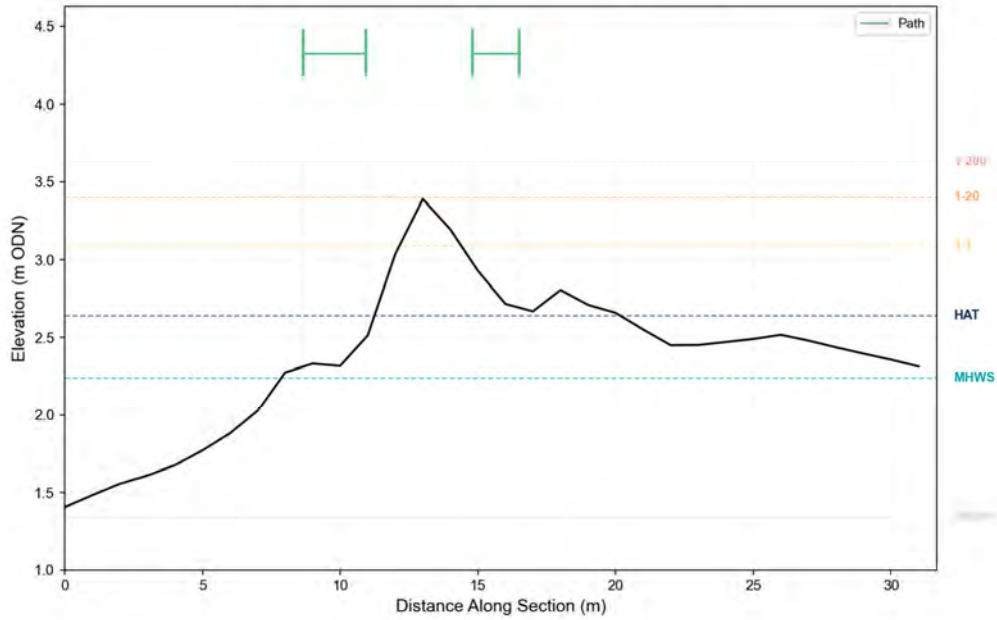
Elevation Profile with 2050 Water Levels: Section S\_3



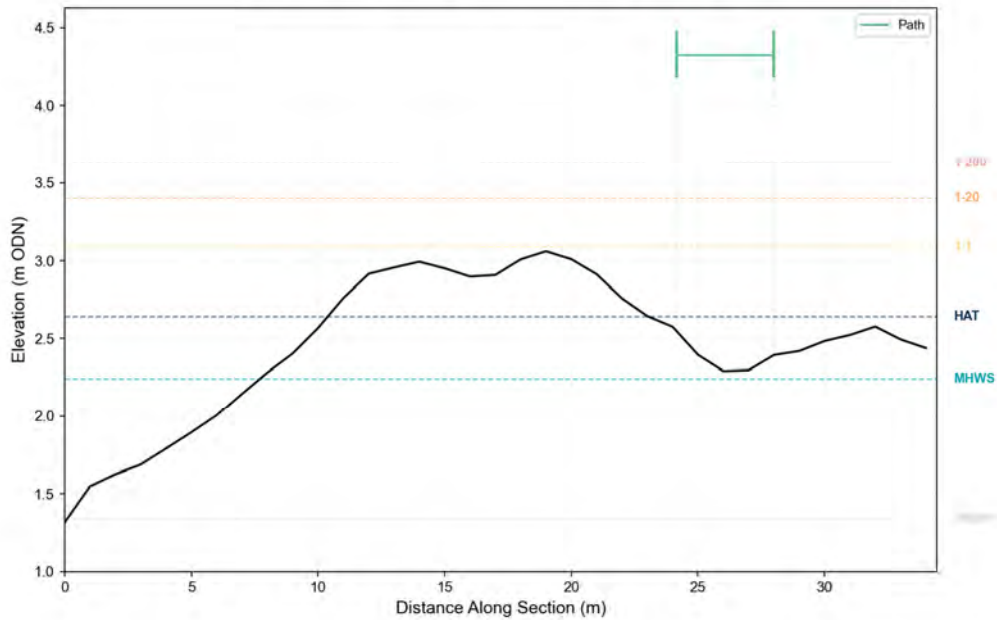
Elevation Profile with 2050 Water Levels: Section S\_4



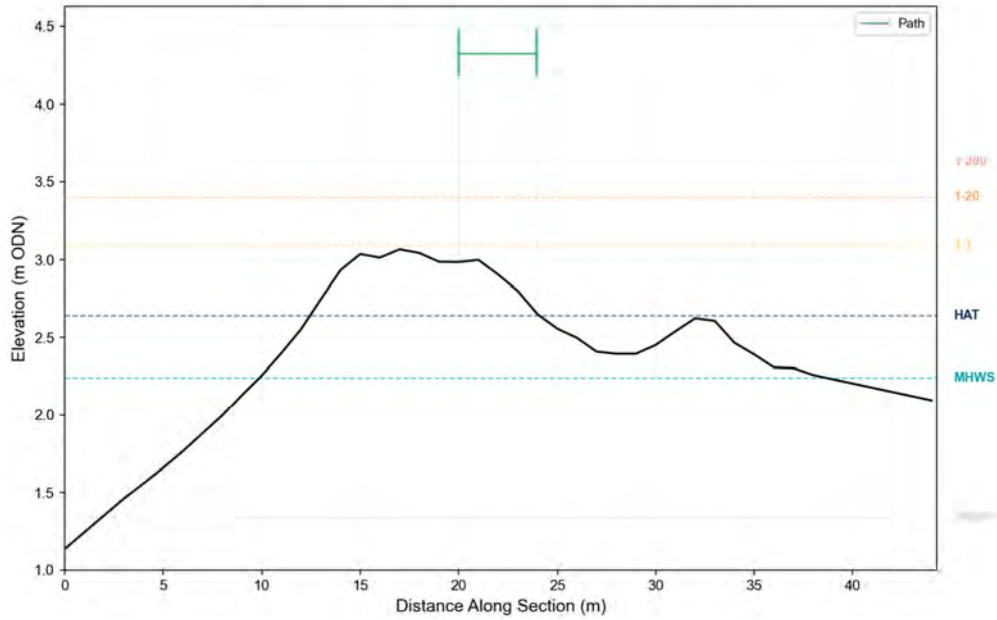
Elevation Profile with 2050 Water Levels: Section S\_5



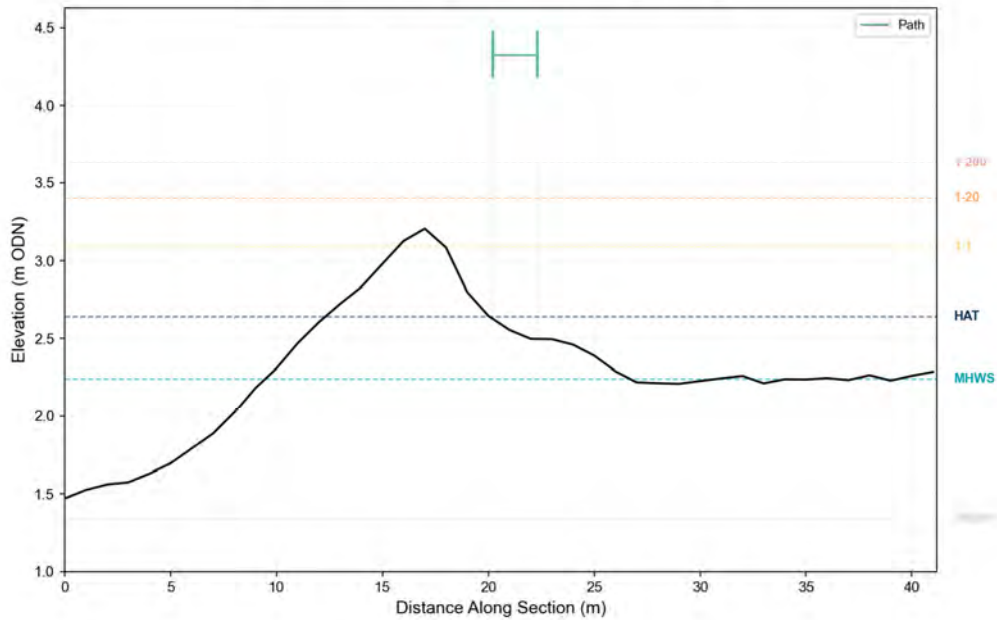
Elevation Profile with 2050 Water Levels: Section S\_6



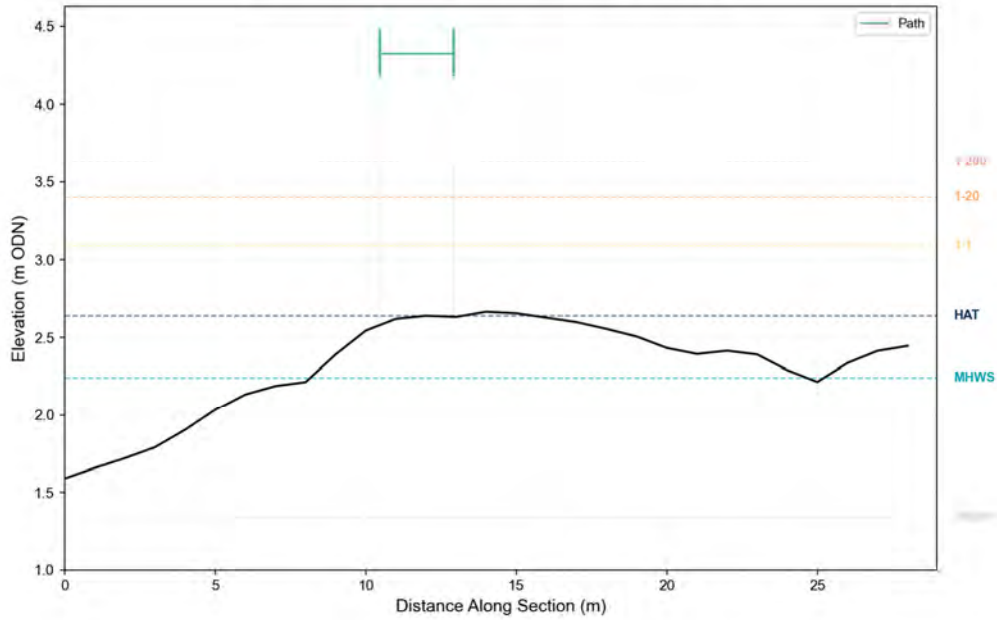
Elevation Profile with 2050 Water Levels: Section S\_7



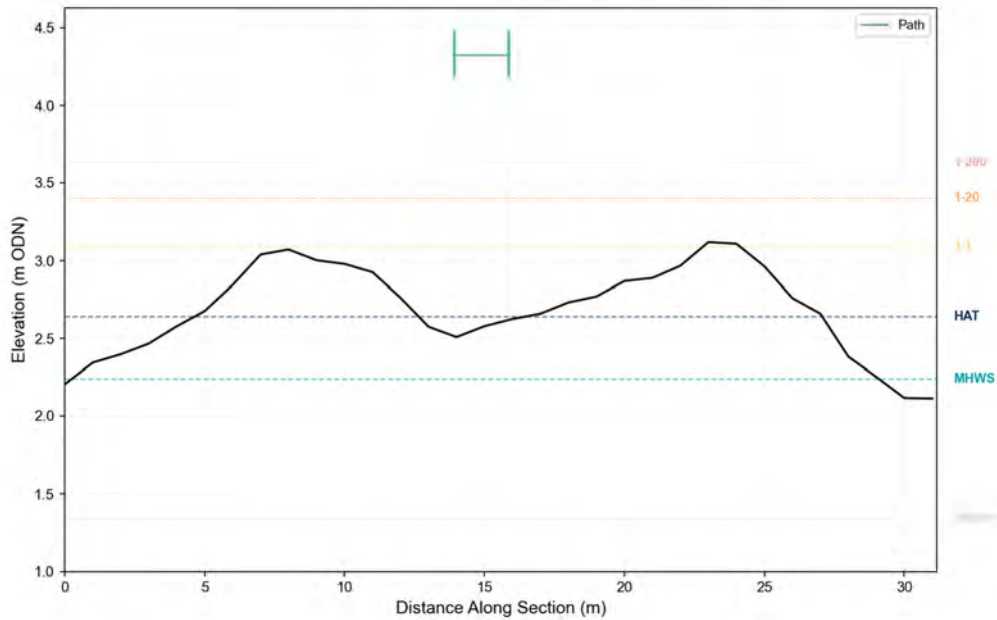
Elevation Profile with 2050 Water Levels: Section S\_8



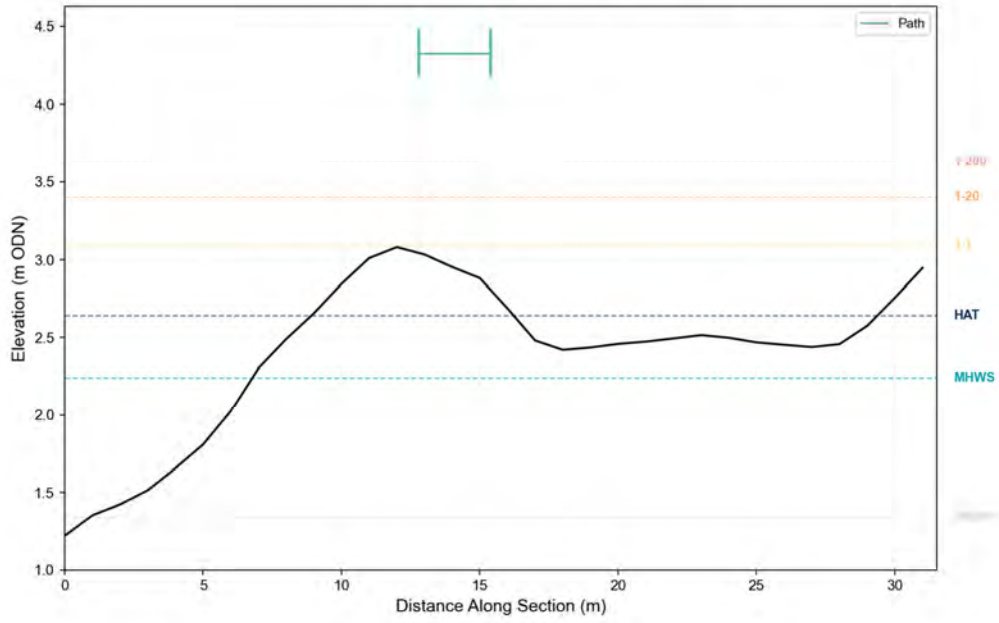
Elevation Profile with 2050 Water Levels: Section S\_9



Elevation Profile with 2050 Water Levels: Section S\_10

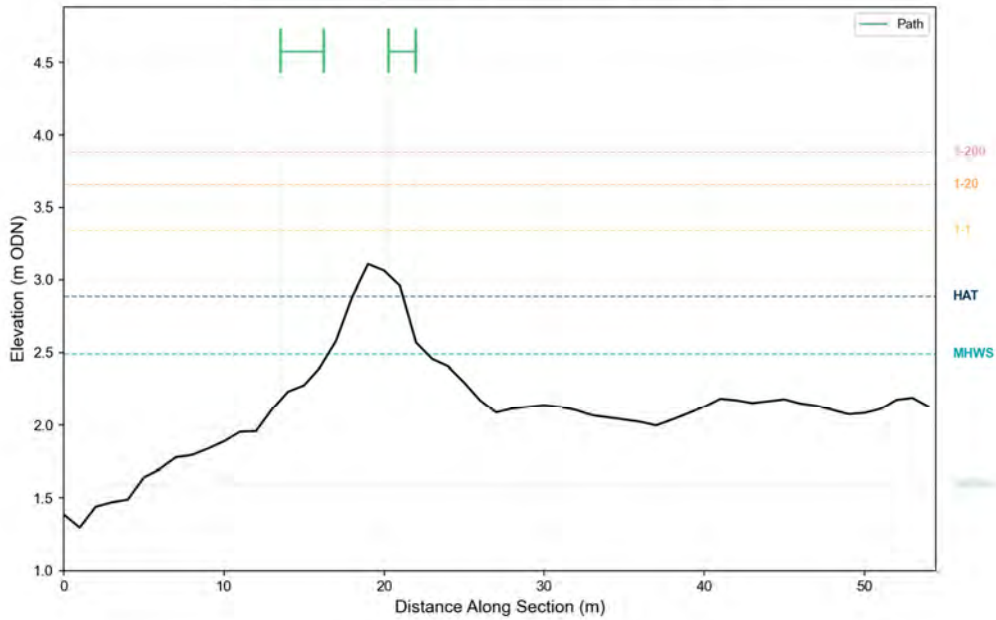


Elevation Profile with 2050 Water Levels: Section S\_11

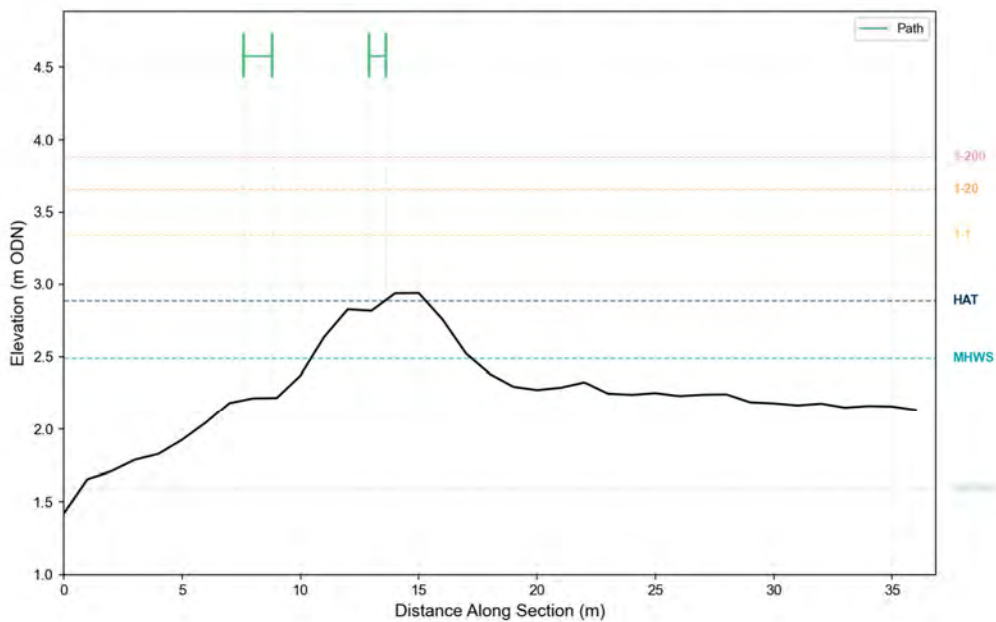


### A1.3 2075

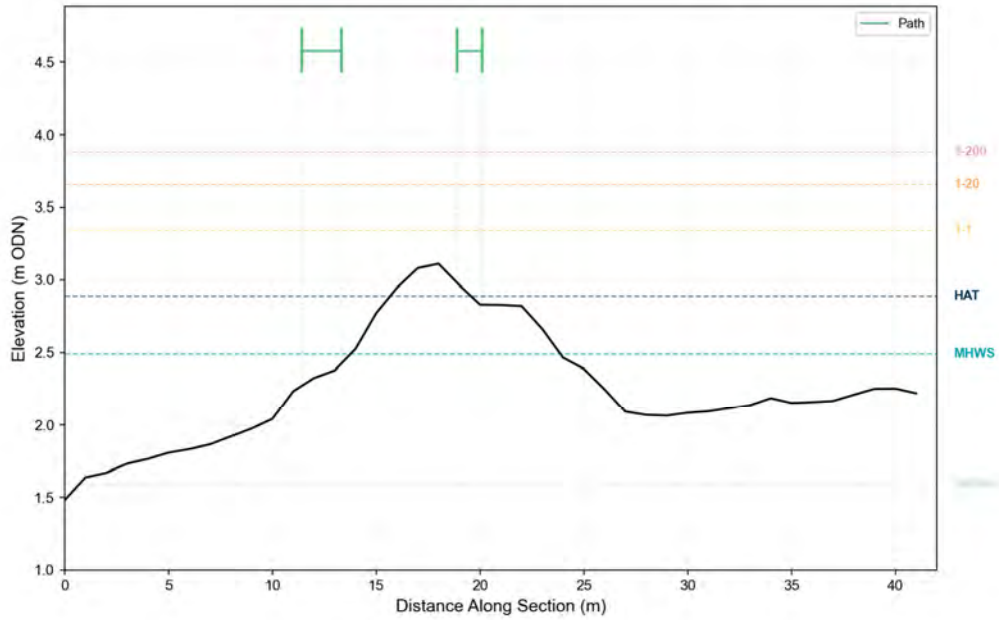
Elevation Profile with 2075 Water Levels: Section S\_1



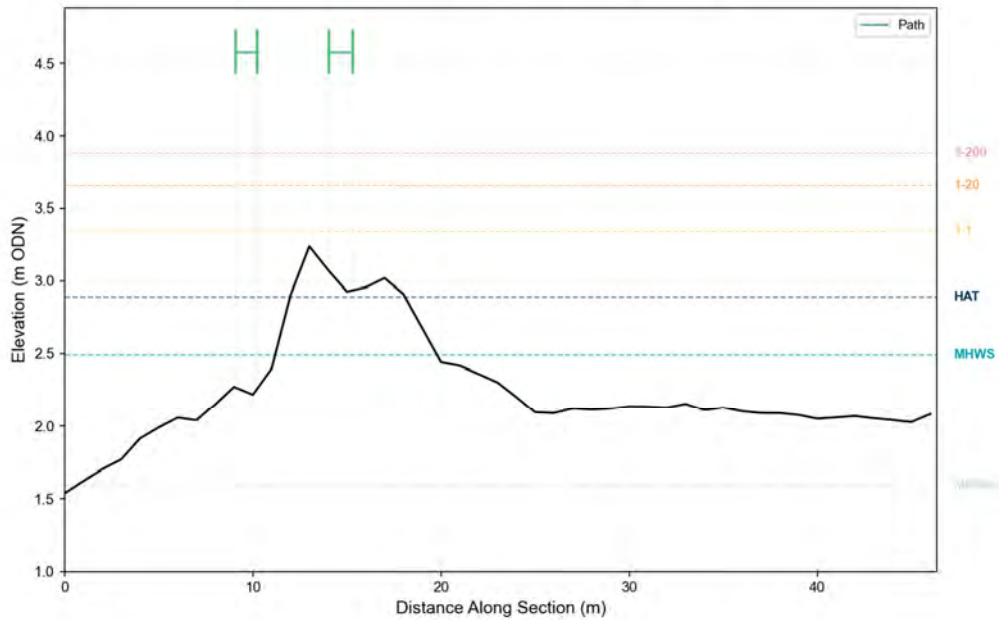
Elevation Profile with 2075 Water Levels: Section S\_2



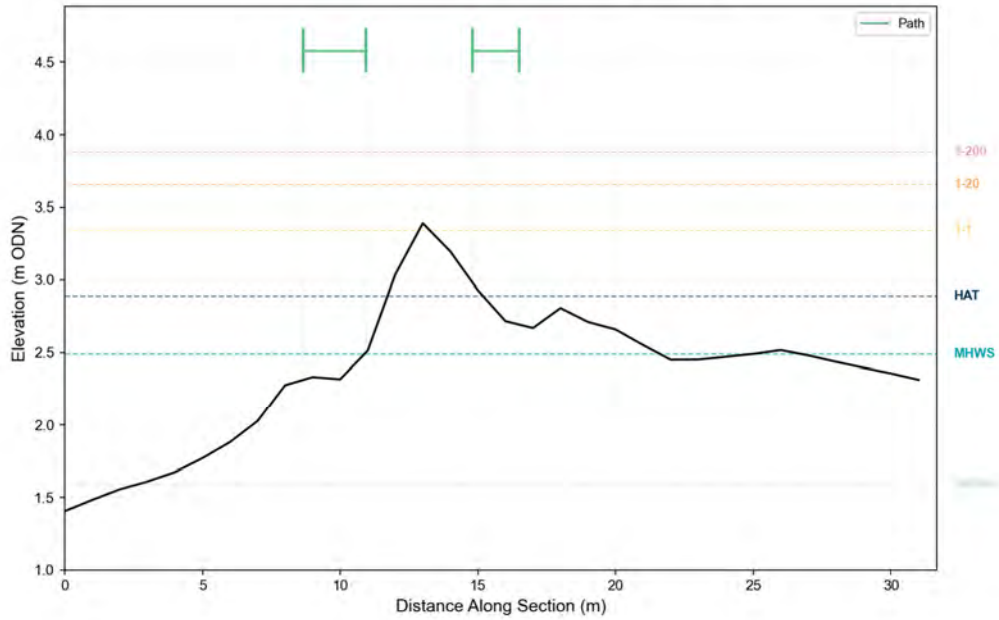
Elevation Profile with 2075 Water Levels: Section S\_3



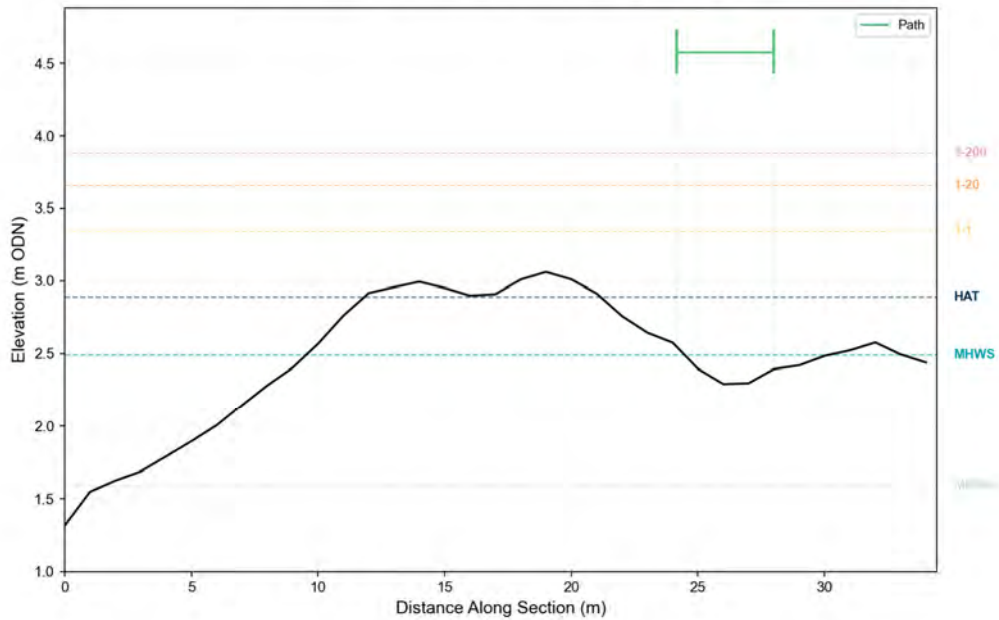
Elevation Profile with 2075 Water Levels: Section S\_4



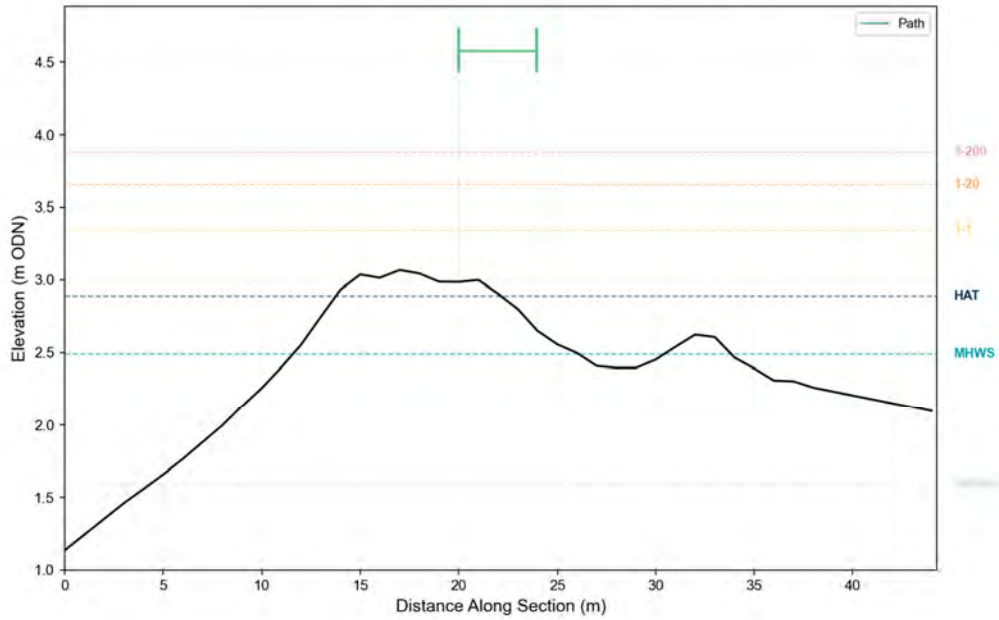
Elevation Profile with 2075 Water Levels: Section S\_5



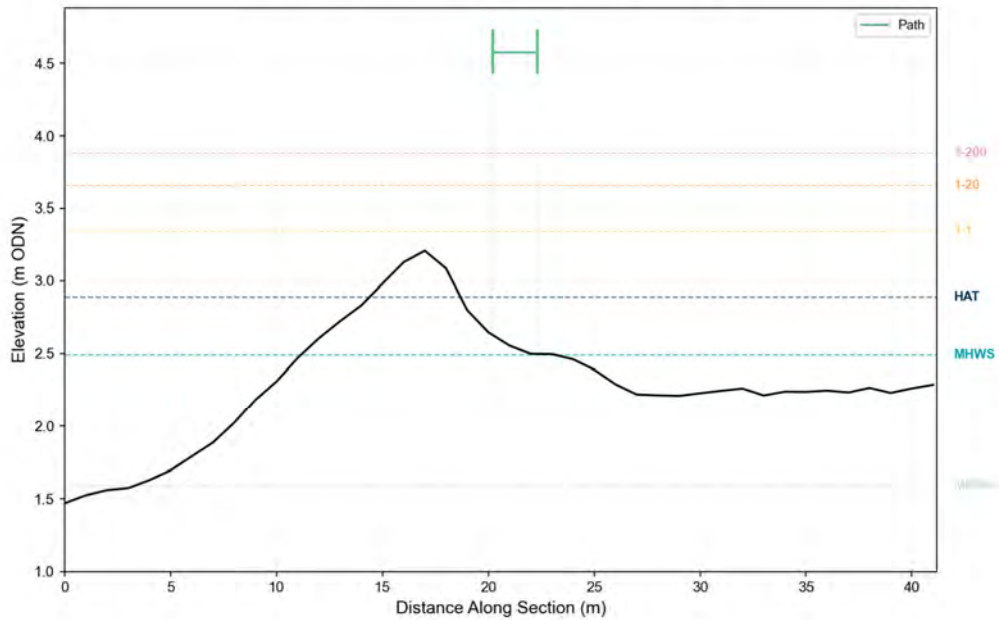
Elevation Profile with 2075 Water Levels: Section S\_6



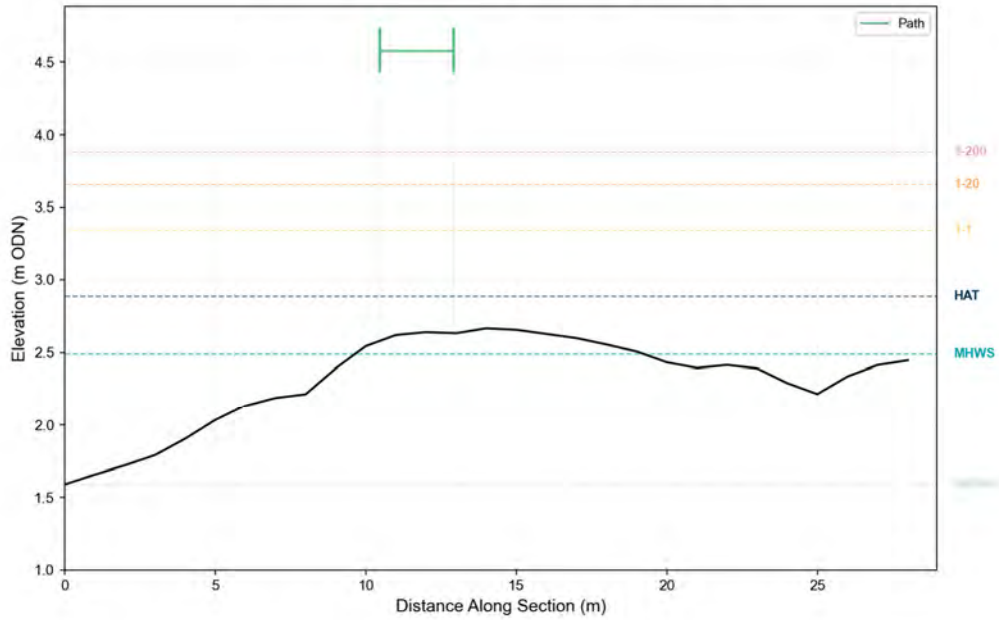
Elevation Profile with 2075 Water Levels: Section S\_7



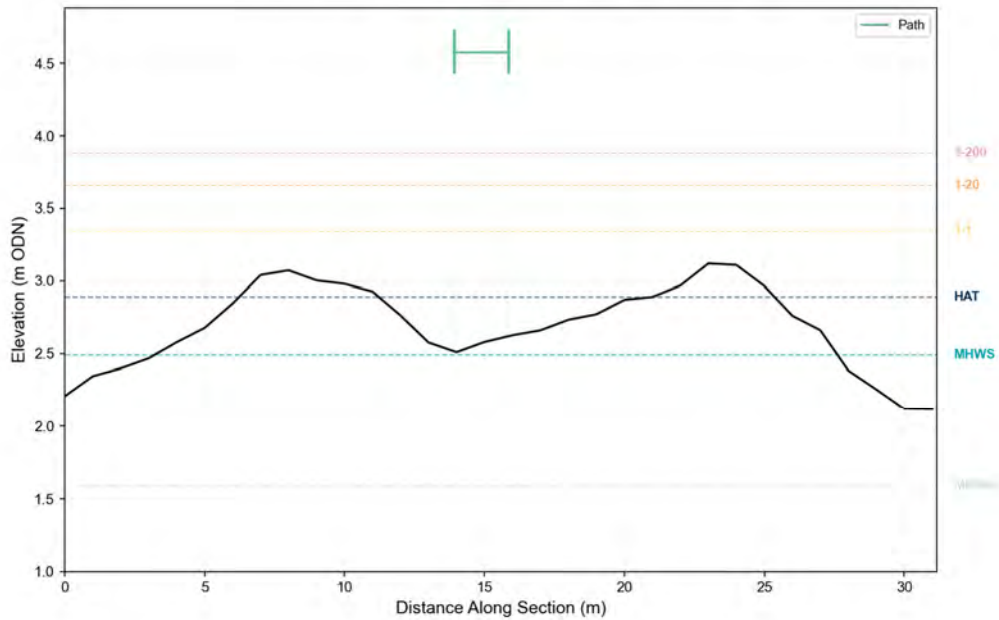
Elevation Profile with 2075 Water Levels: Section S\_8

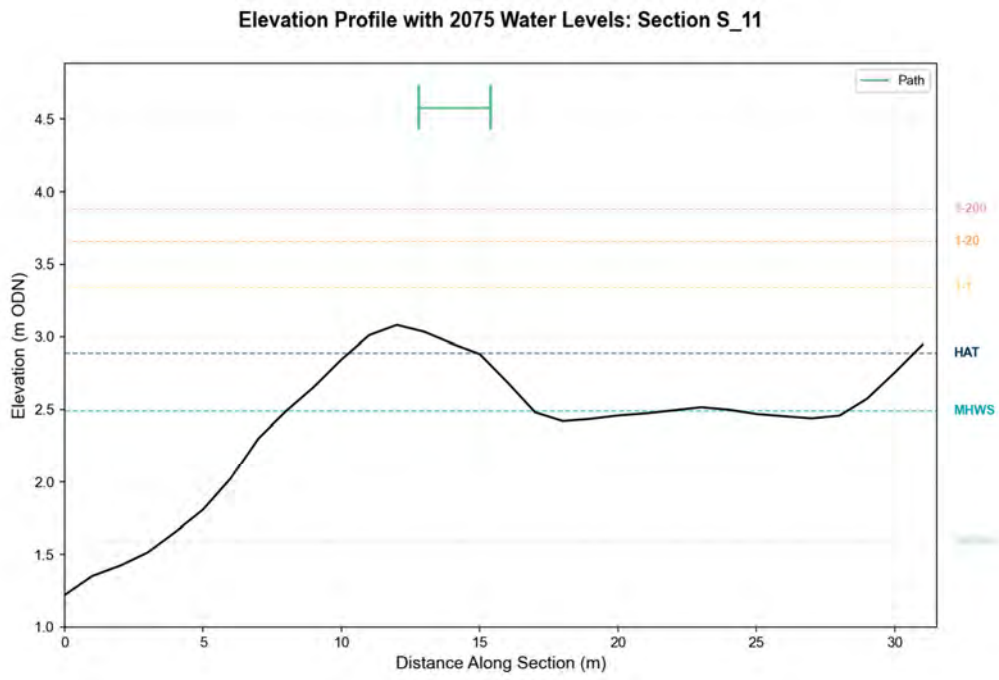


Elevation Profile with 2075 Water Levels: Section S\_9



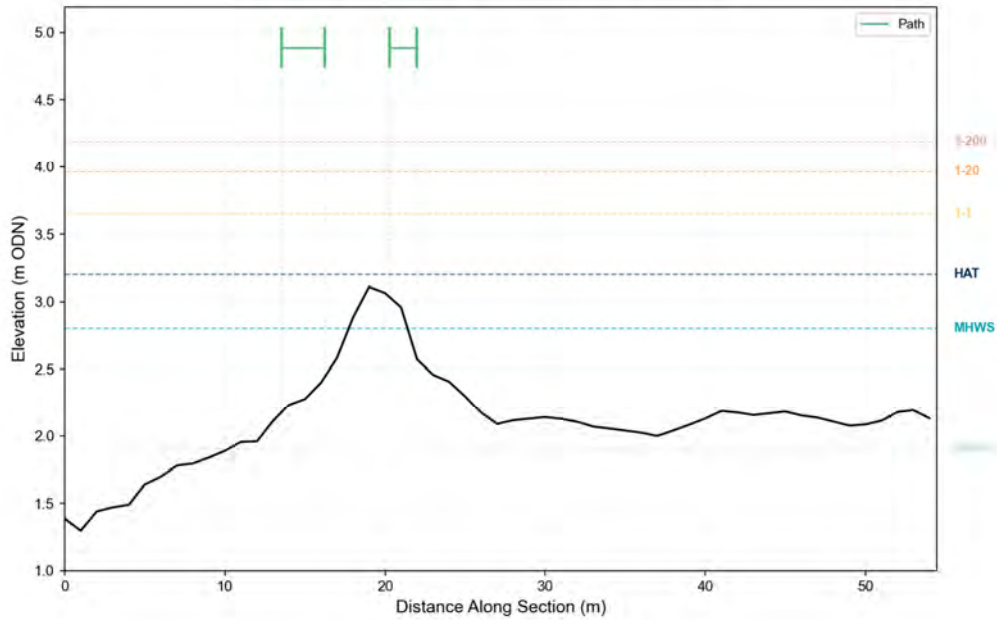
Elevation Profile with 2075 Water Levels: Section S\_10



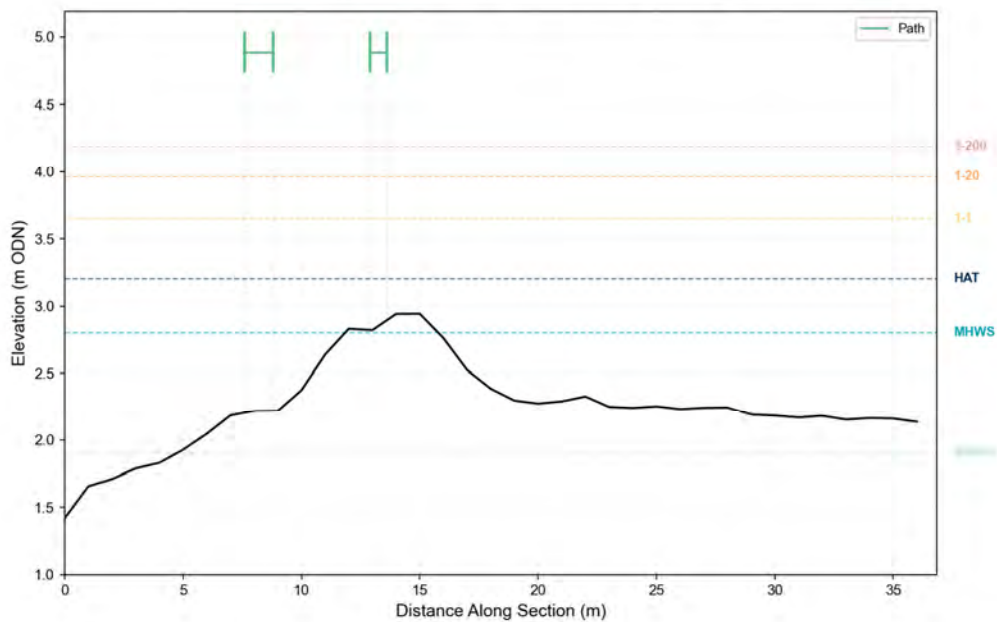


### A1.4 2100

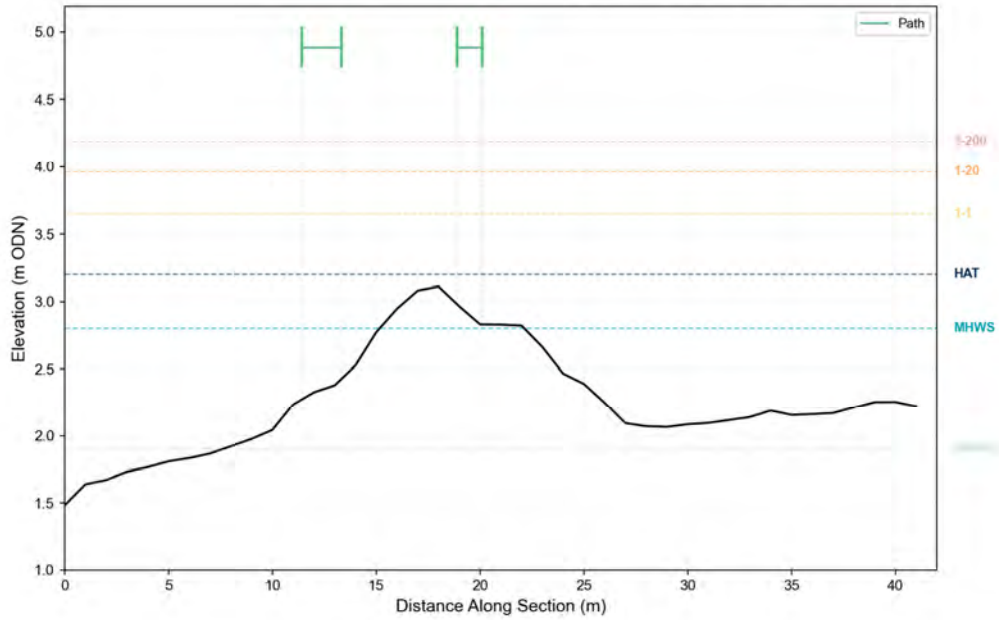
Elevation Profile with 2100 Water Levels: Section S\_1



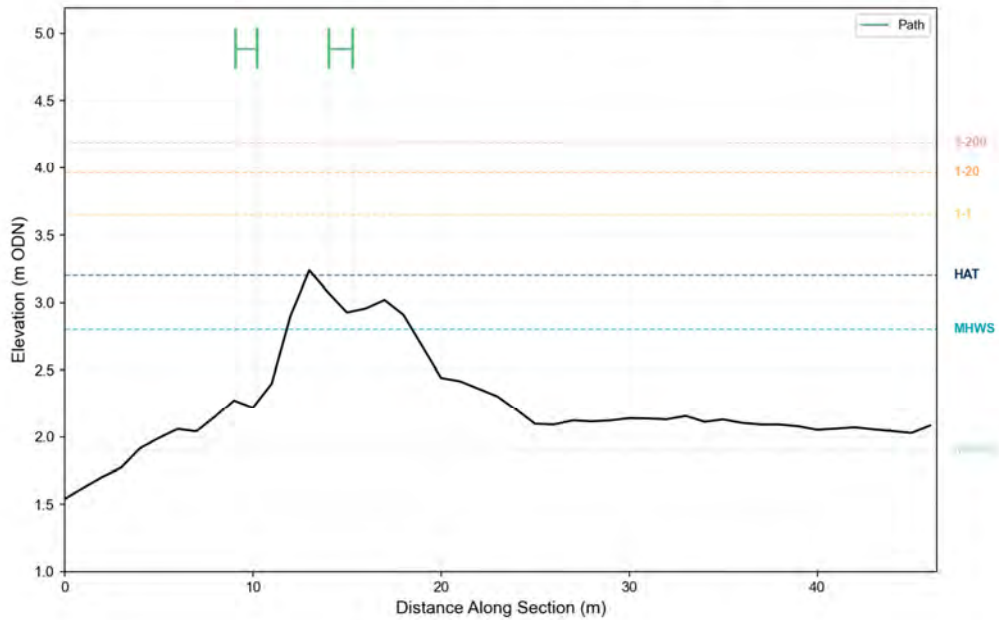
Elevation Profile with 2100 Water Levels: Section S\_2



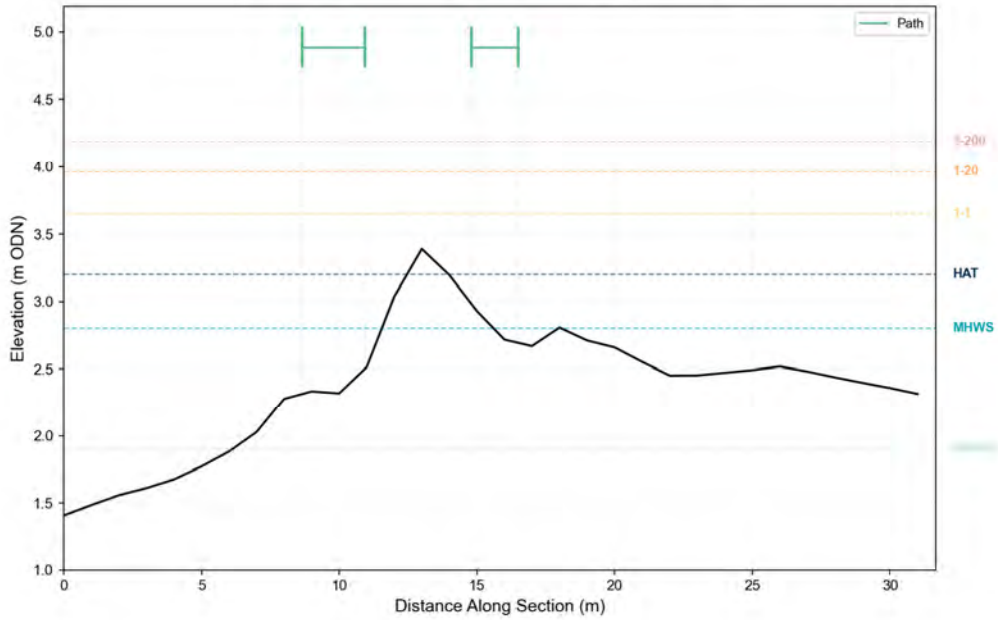
Elevation Profile with 2100 Water Levels: Section S\_3



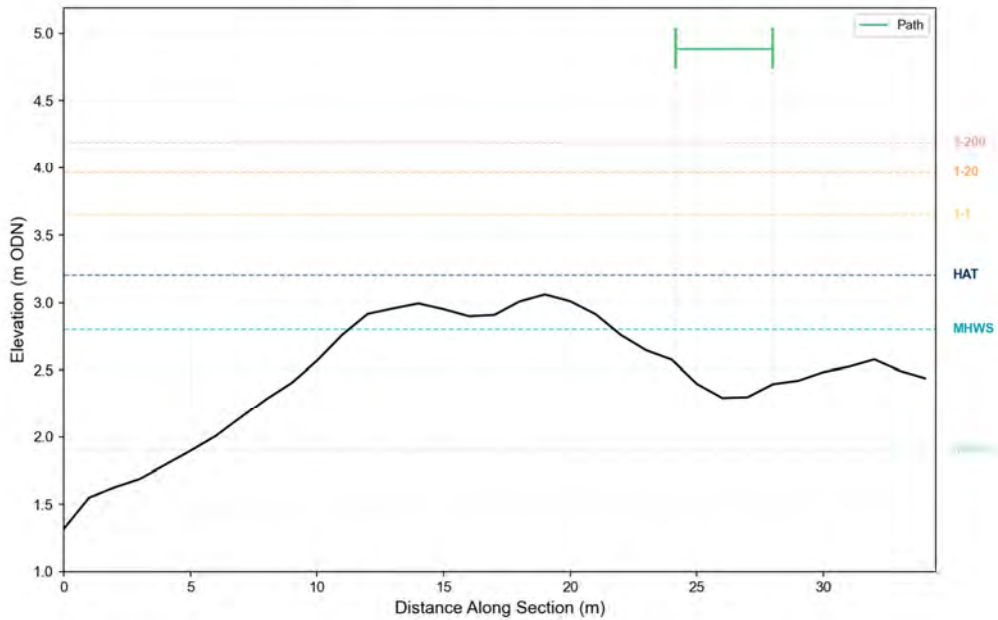
Elevation Profile with 2100 Water Levels: Section S\_4



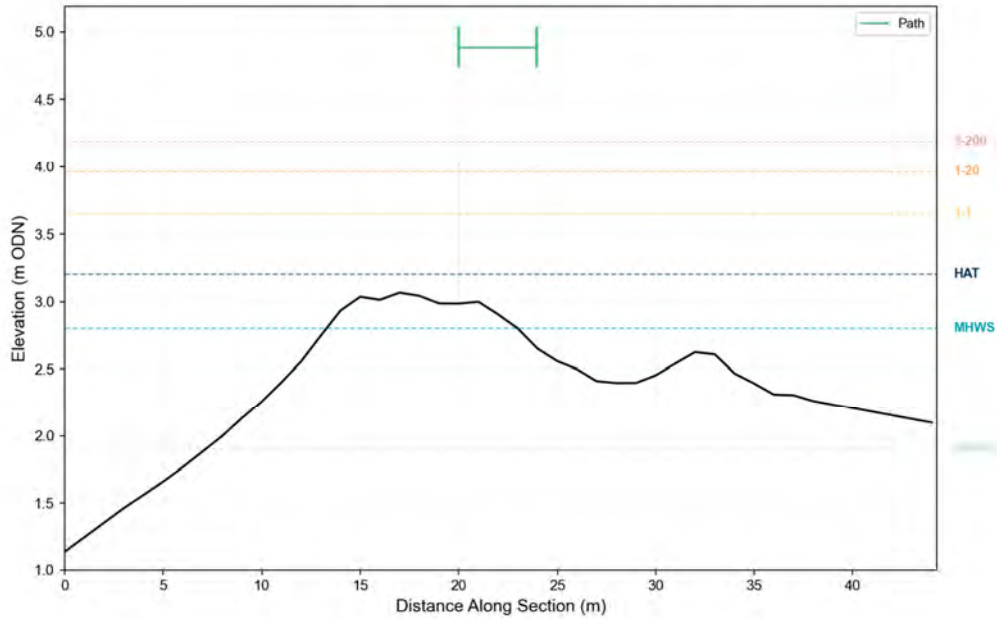
Elevation Profile with 2100 Water Levels: Section S\_5



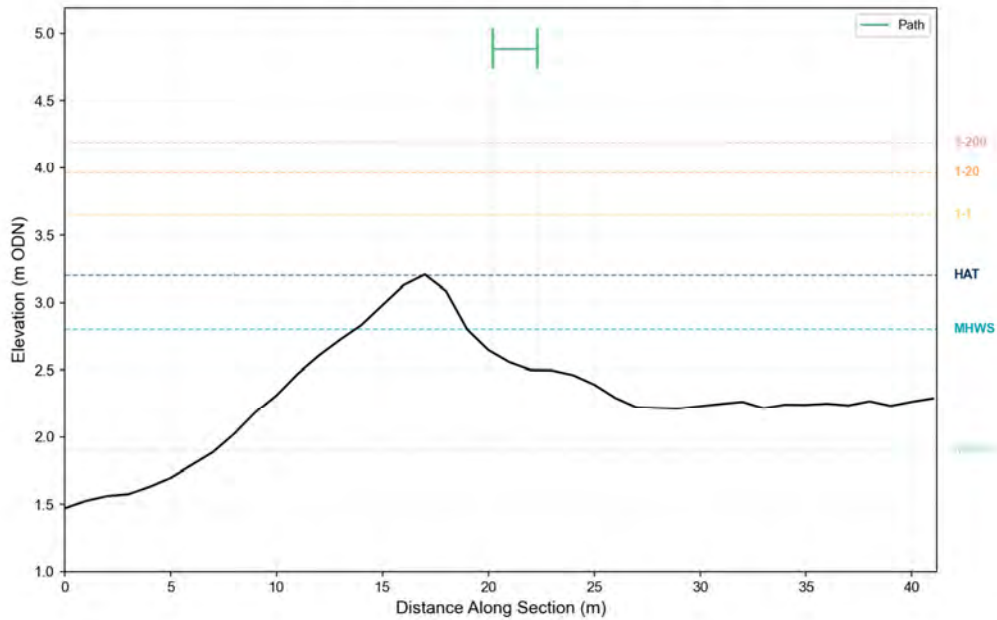
Elevation Profile with 2100 Water Levels: Section S\_6



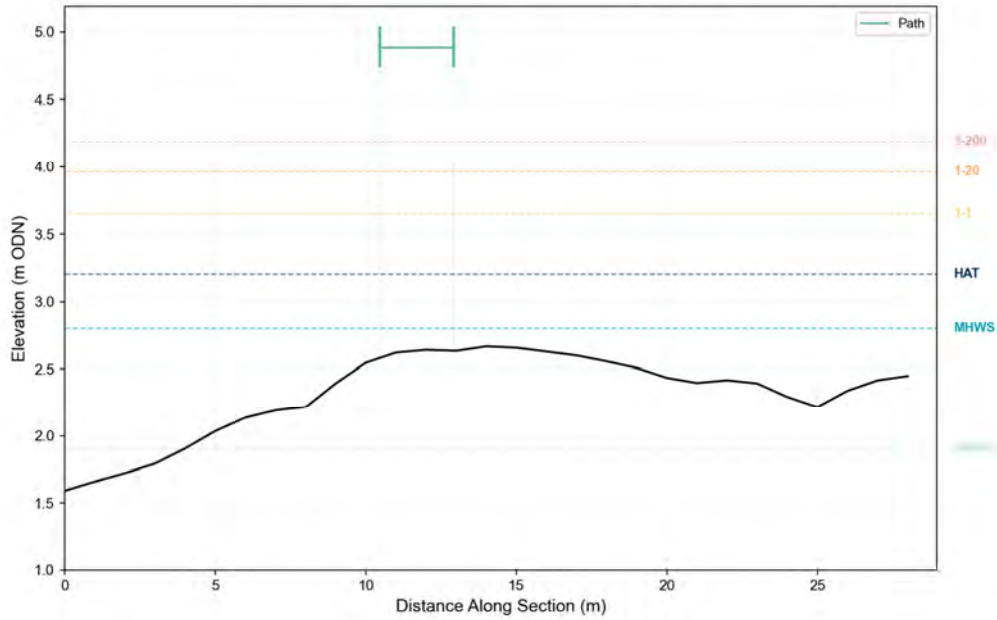
Elevation Profile with 2100 Water Levels: Section S\_7



Elevation Profile with 2100 Water Levels: Section S\_8



Elevation Profile with 2100 Water Levels: Section S\_9



Elevation Profile with 2100 Water Levels: Section S\_10

