Hook Lake Intertidal Habitat Creation – A feasibility study

Presentation to Solent Forum
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Introductions

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Working on behalf of Fareham Borough Council

Agenda

1. Background to the Study
2. Key Findings of the Study
3. Next Steps

The Hook Lake Study Recap

Overview – Hook Lake

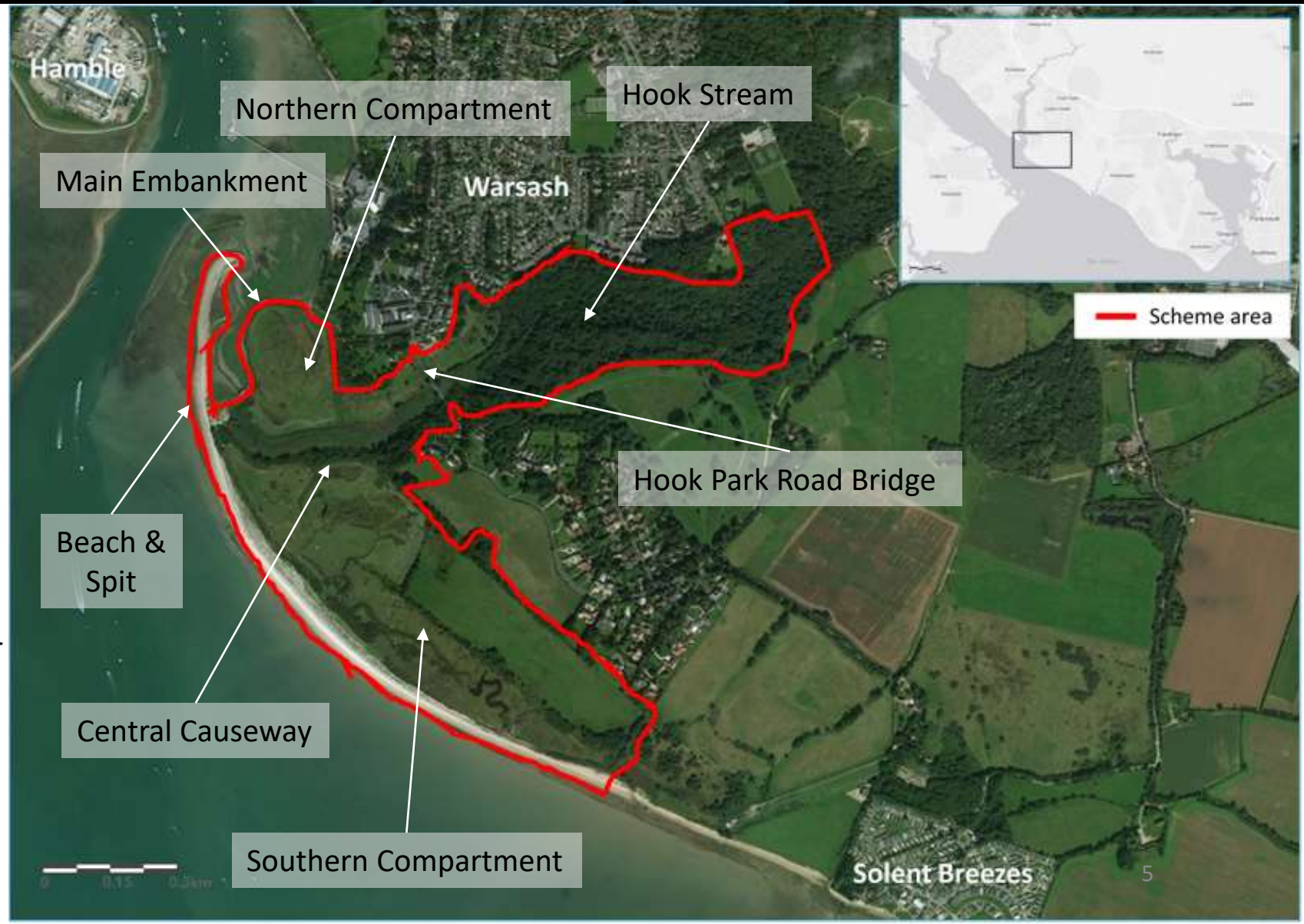
Location

Hampshire County Council
Environment Agency

Local Nature Reserve, Environmental designations across site – Ramsar, SAC, SPA, SSSI, SINC, LNR

Existing Terrestrial and Freshwater Habitats
36ha of coastal grazing marsh, 4ha of reedbed, shingle beach and spit

Potential site for intertidal habitat creation



Overview – Key Features

Hook Park Road Bridge

Hook Park

- 75 Address Points

Habitat Compensation and Restoration Programme (HCRP)

- The Habitat Compensation and Restoration Programme (HCRP) is a strategic programme run by the Environment Agency which seeks to **replace habitats that are lost due to coastal squeeze or tidal inundation effects that arise from the management of coastal defences.**

- Provides mechanism for offsetting habitat losses occurring through implementation of Shoreline Management Plan (SMP) policies

- **Legal Obligation** to deliver habitat compensation

- **Hook Lake** has been identified as a key high priority habitat compensation site to create up to **40.5 ha of compensatory habitat**

Image of the main embankment at Hook Lake

https://southerncoastalgroup-scopac.org.uk/rhcp/
GOV.UK – What is Coastal Squeeze?

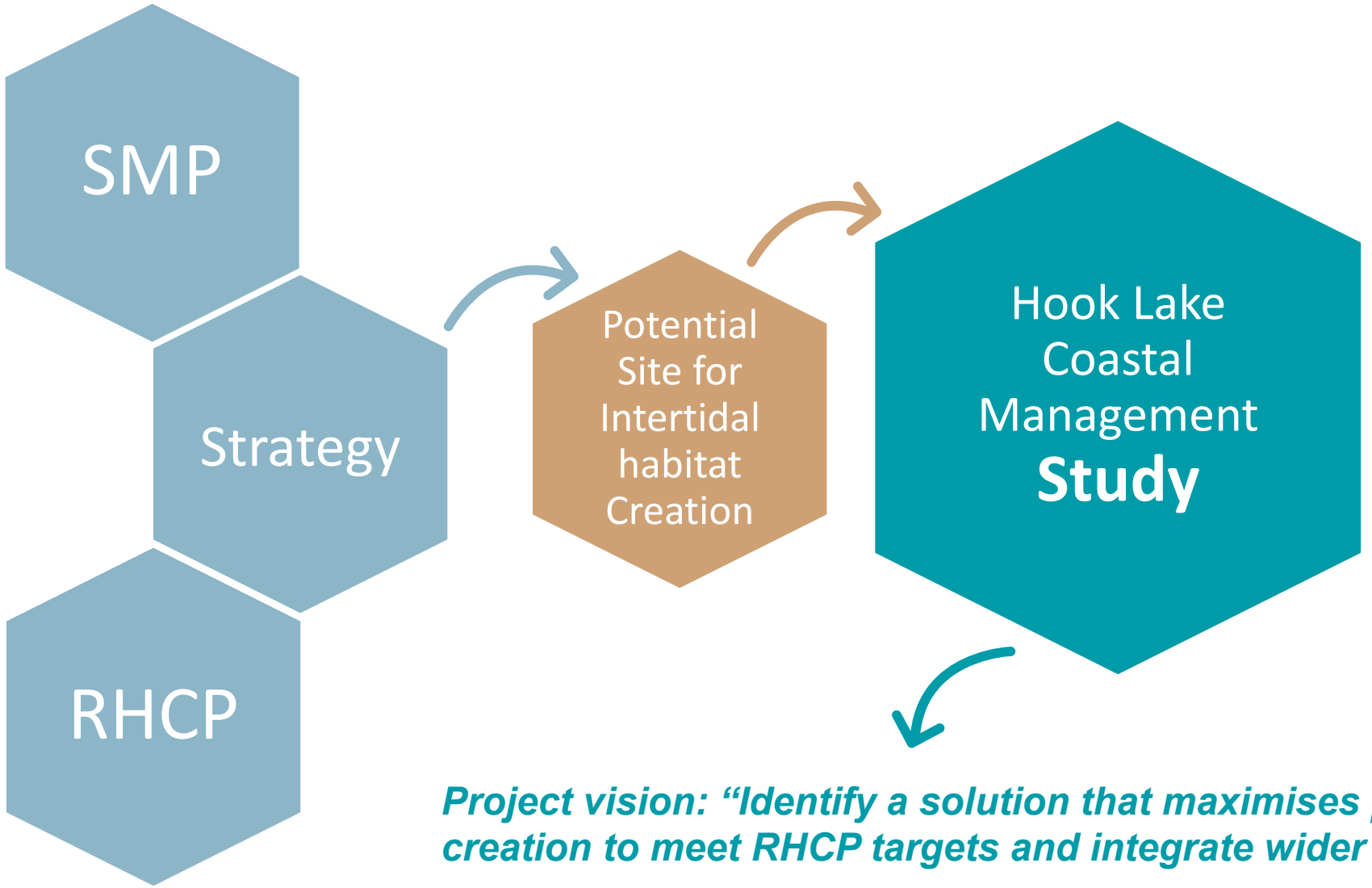
Intertidal Habitat Creation

Why do we need to create more intertidal habitats?

- Sea level rise leading to ‘coastal squeeze’ and tidal inundation
- Decline of intertidal habitats – area and quality

Diagram showing how the presence of coastal defences can lead to coastal squeeze and the loss of intertidal habitats

The Hook Lake Coastal Management Study



First Stage

- 2 year study (2021-23)
- Better understand the site through **preliminary investigations**
- Explore the potential for creating new intertidal habitats
- **Identify potential solutions**
- Look at wider recreation opportunities
- **Develop preliminary designs and a business case for an intertidal habitat creation scheme**

Project vision: "Identify a solution that maximises potential for intertidal habitat creation to meet RHCP targets and integrate wider opportunities for place making"

The Hook Lake Coastal Management Study

Coastal Partners

Who is Involved?

The 'Client'

FAREHAM BOROUGH COUNCIL

Funded by

Environment Agency

Project Team

Coastal Partners

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Project Partners

Hampshire County Council

NATURAL ENGLAND

Environment Agency

FAREHAM BOROUGH COUNCIL

Project Objectives

Coastal Partners

Create Intertidal Habitat

Develop Feasible Designs

Environmental Considerations

Environmental Enhancement

Stakeholder Support

Community Support

Wider Benefits

Secure Investment

Key Findings of the Study

Progress to Date

Coastal Partners

Data Review

Preliminary Investigations

Confirm Project Objectives

Longlist Options

Screening of Longlist

Identify Shortlist

Shortlist Public Exhibition

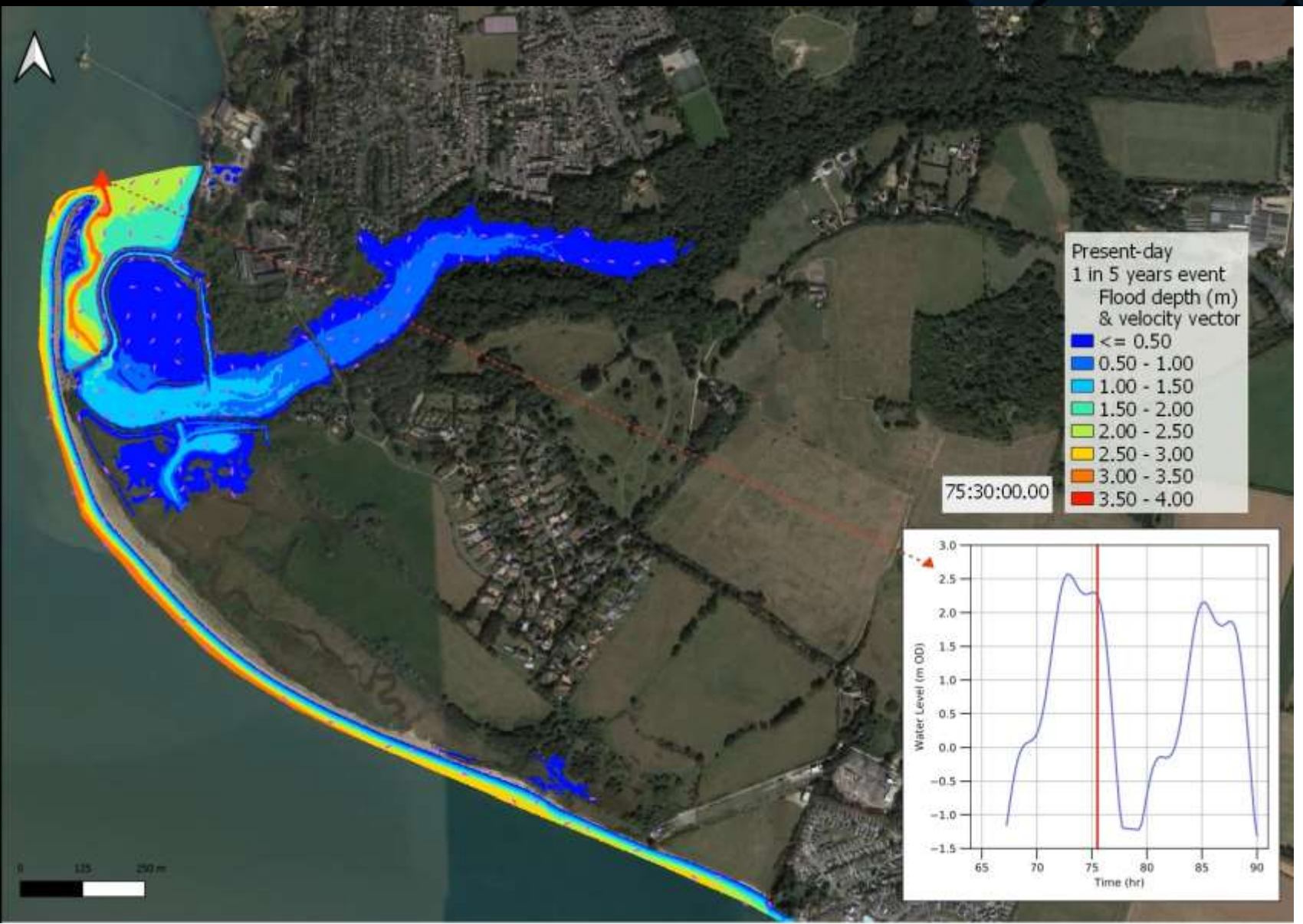
Shortlist Appraisal

Understanding the Site

Understanding its Potential

Working out if it is possible to create intertidal habitats here

Baseline Hydrodynamic Modelling

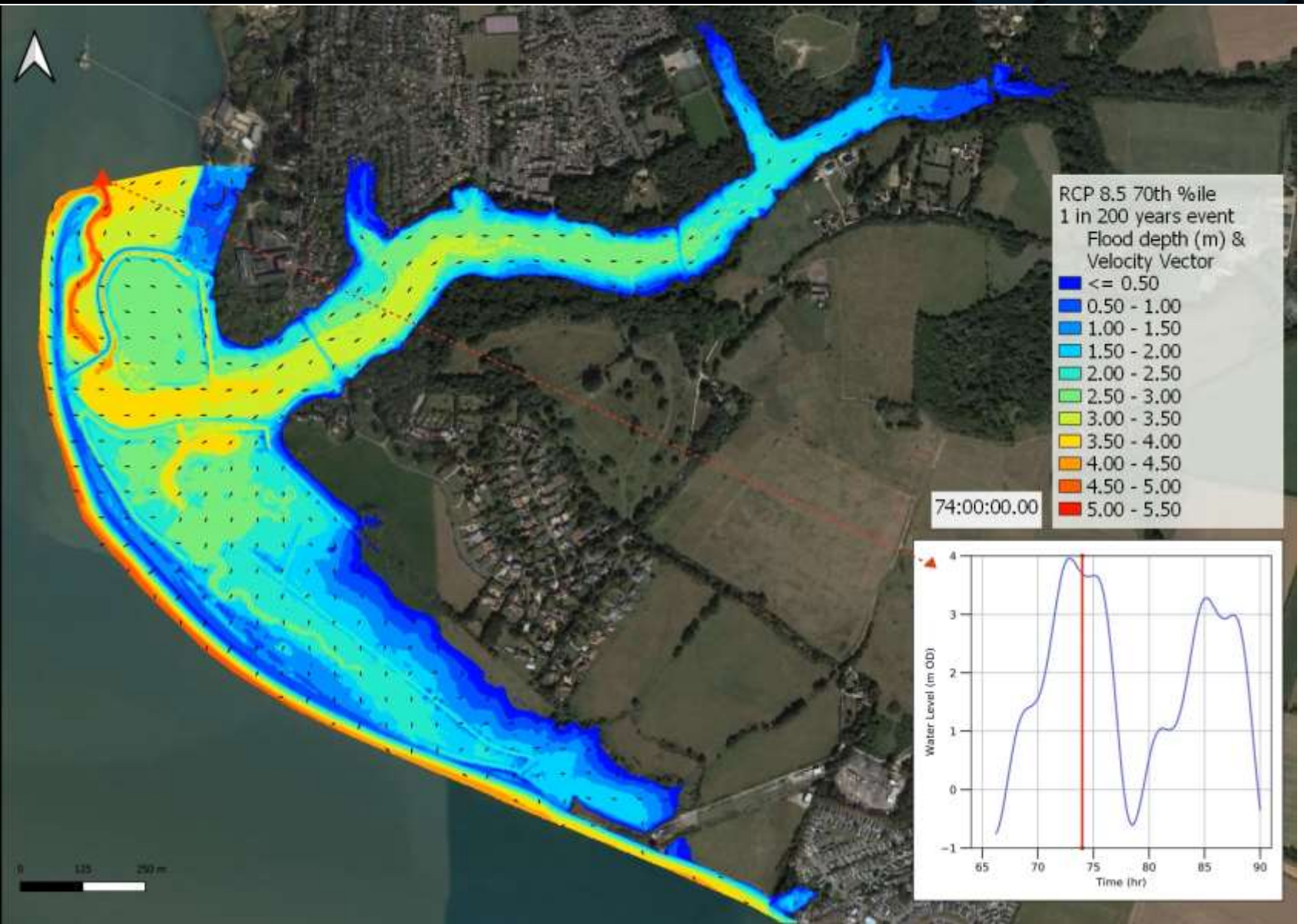


Flood Depth (m) with Velocity Vectors

Present day

1 in 5 year event

Baseline Hydrodynamic Modelling



Flood Depth (m) with Velocity Vectors

2120 (without scheme)
1 in 200 year event including impacts of Climate Change

New understanding of future flood risk

Existing Flood Risk

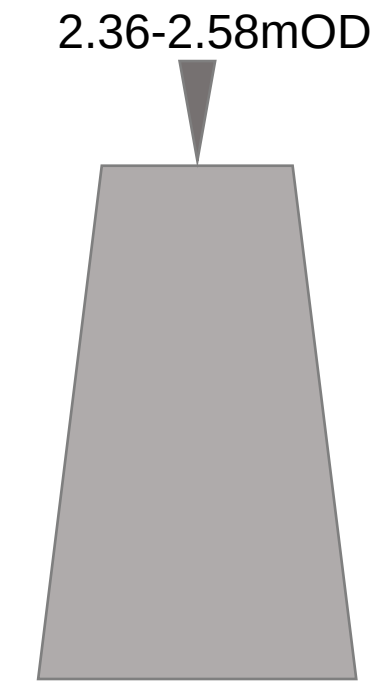
Barra - Flooding 7th December 2021

Eunice – 18th February 2022

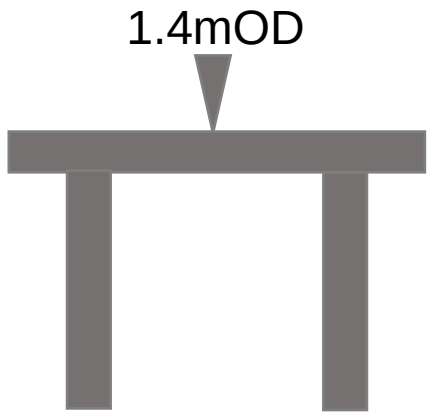
Existing Flood Risk

Relative Elevations of Key Features

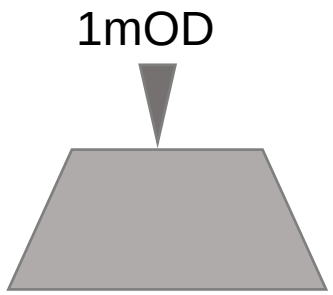
NOT TO SCALE



Main Embankment



Road Bridge

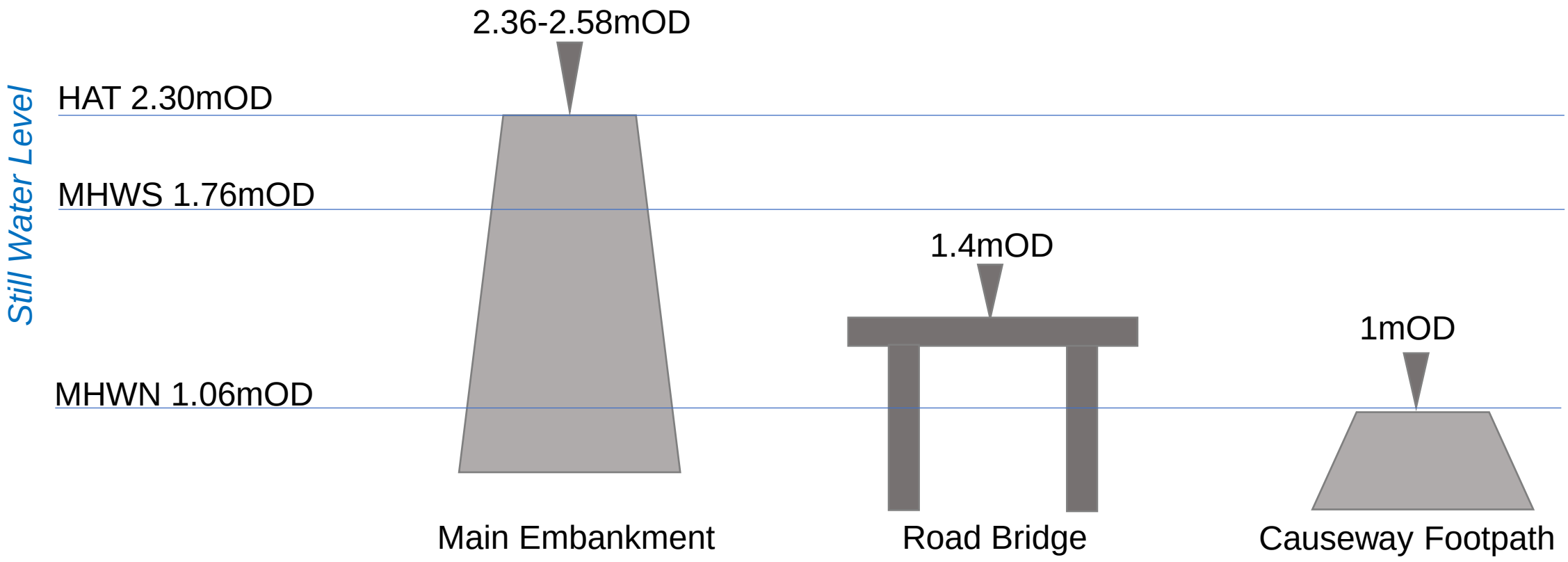


Causeway Footpath

Existing Flood Risk

Mapping Still Water Levels

NOT TO SCALE



Existing Flood Risk

NOT TO SCALE

Extremes

Still Water Level

1 in 200yr 2.93mOD

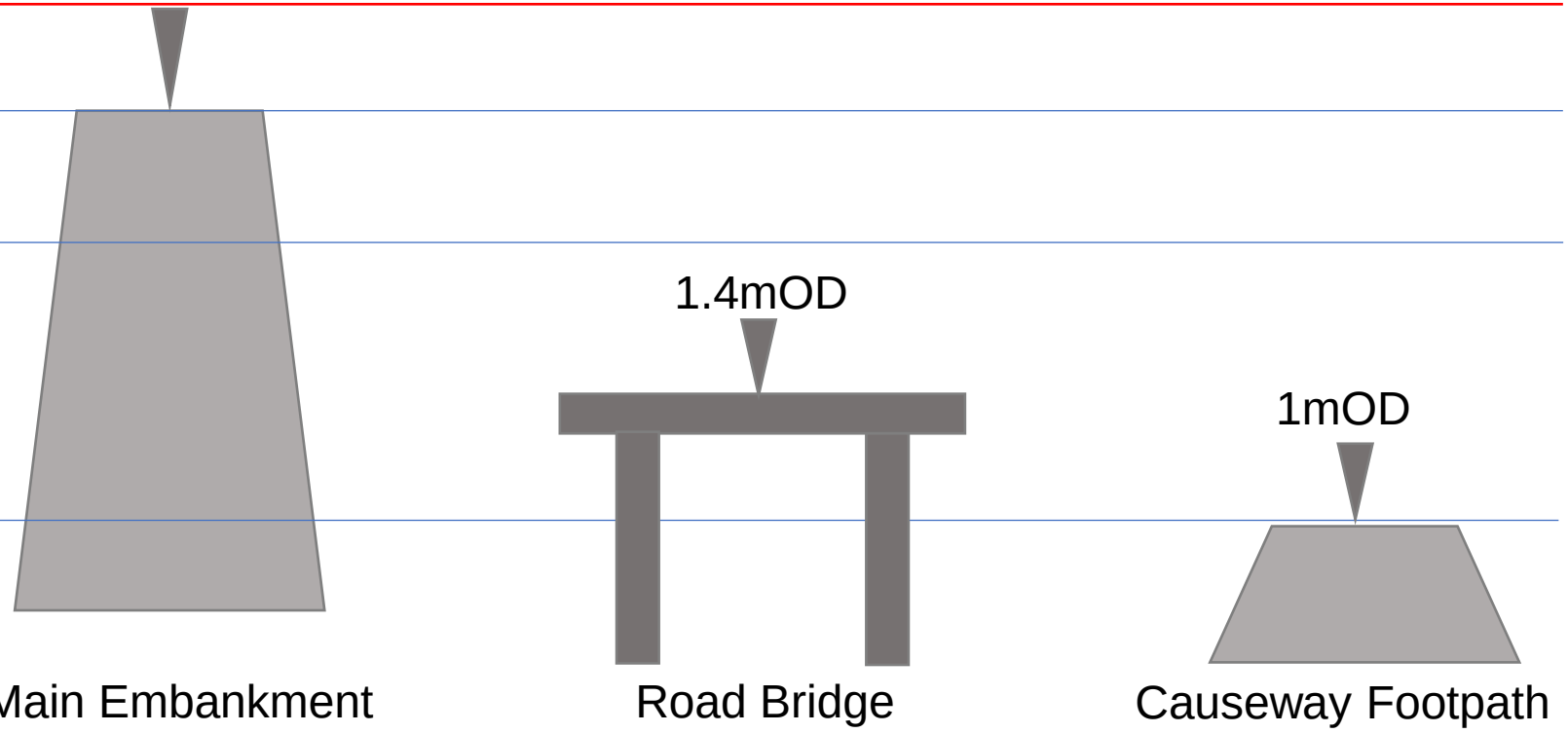
1 in 10yr 2.64mOD

1 in 5yr 2.57mOD

HAT 2.30mOD

MHWS 1.76mOD

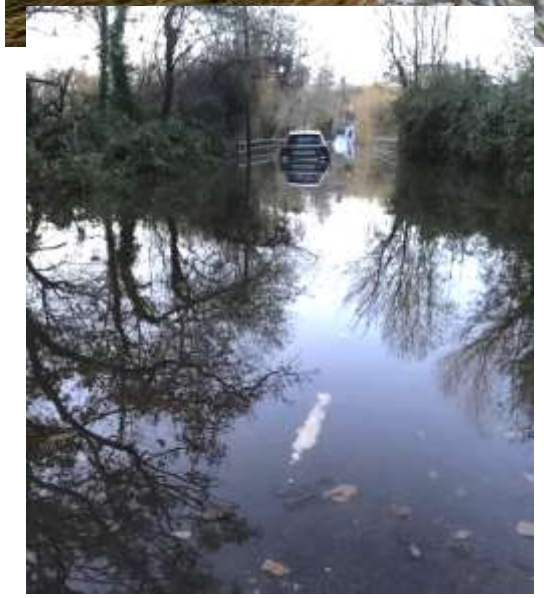
MHWN 1.06mOD

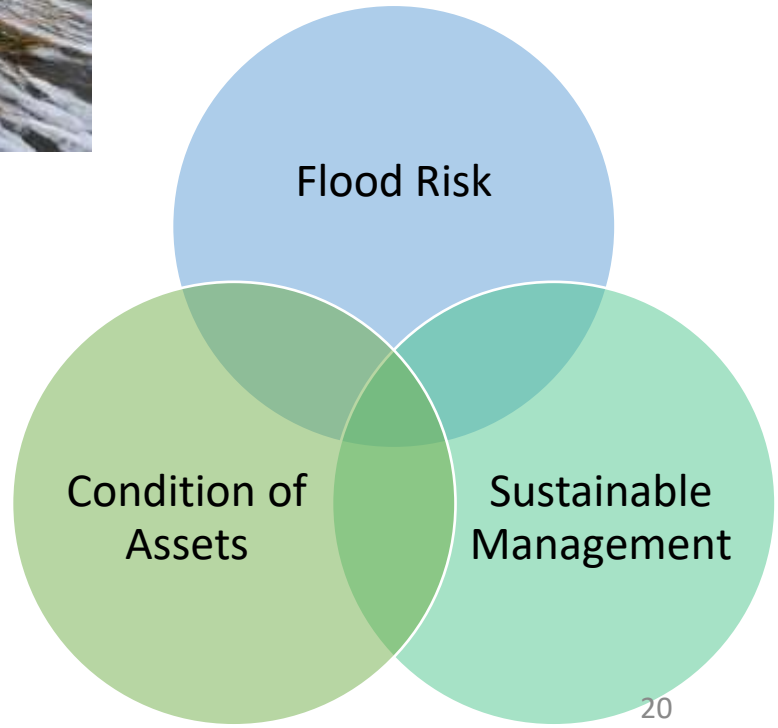


Future +SLR 2120 +1.03m

What happens if we don't do anything?

- Deterioration of main embankment if maintenance ceases
- Continued, more frequent overtopping
- Increased flood risk to the road bridge
- Uncontrolled impacts of flooding
- Coastal Squeeze of intertidal habitats against the embankment
- Loss of footpath network / access
- Missed opportunity to compensate for loss of intertidal habitats





Shortlist Options Appraisal

Shortlisted Options

Option 3
Amend Existing Structures

Remove tidal flaps to enable sea water into Hook Lake and create a breach in the causeway. Reactive maintenance of main embankment. Once at the end of its design life the main embankment will fail. Habitat will be created in a managed way.

Option 5
Managed Breach

Create a breach in the main embankment and causeway, reinforce the remaining main embankment and maintain. Habitat will be created in a managed way.

Option 6
Un-Managed Breach

Create a breach in the main embankment and causeway. Reactive maintenance of main embankment. Once at the end of its design life the main embankment will fail. Habitat will be created in a managed way.

All Options:

- ✓ **Meet legal obligation** to create intertidal habitats
- ✓ Are **technically feasible**
- ✓ Depend on **tidal flooding**
- ✓ **Use existing features**
- ✓ Will result in a change of **freshwater to saline** (intertidal) habitats
- ✓ Assume that the main embankment condition is poor and that it will not be maintained in medium to long term.

Leading FCERM Option

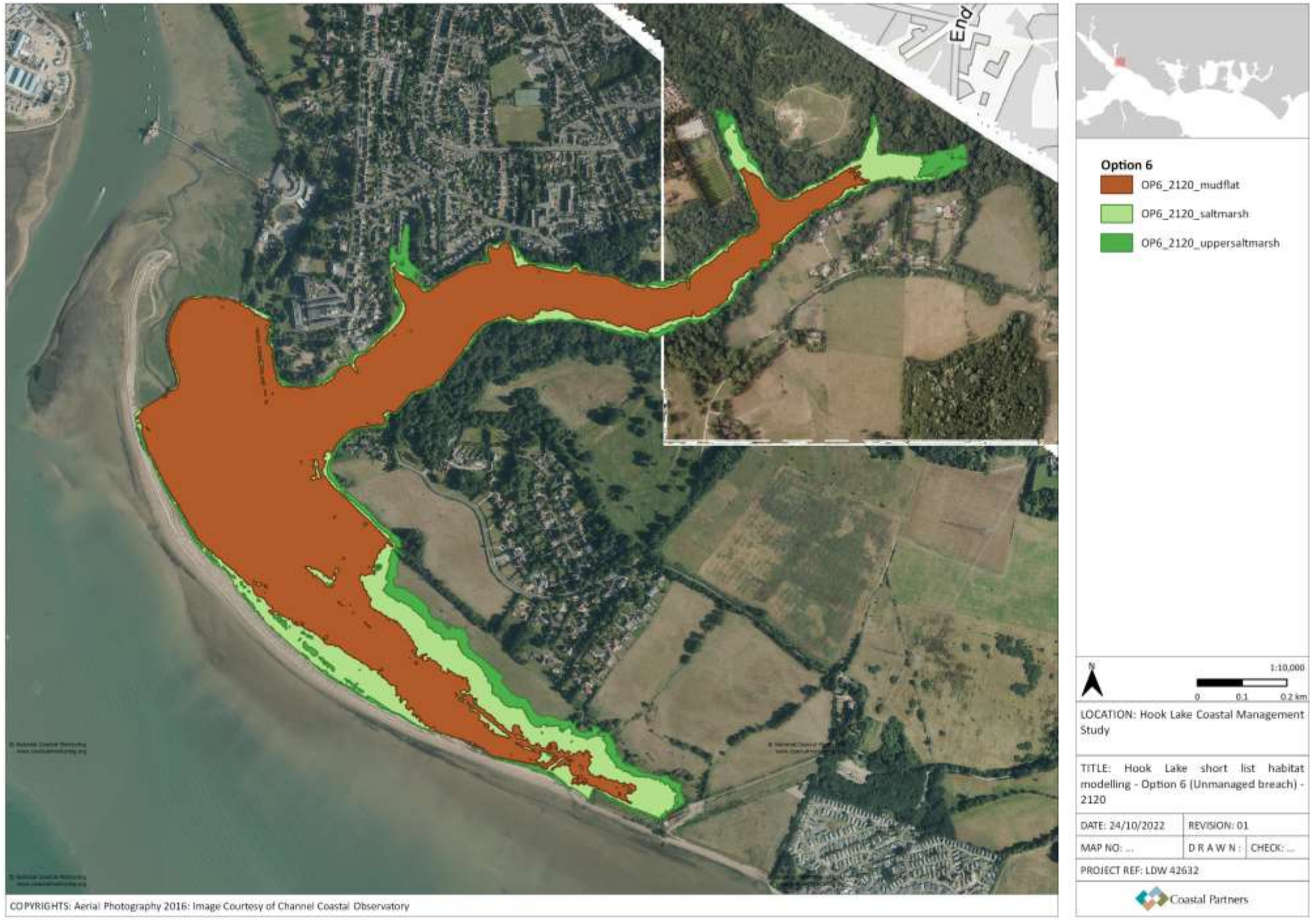
- Leading FCERM Option is the least cost option which meets the Legal Objective

Shortlist Option Number	Option 2	Option 3	Option 5	Option 6
Shortlist Option Name	Business as usual / with present management (ECONOMIC BASELINE)	Remove tide flaps to existing sluice (LEGAL MINIMUM BASELINE)	Managed breach in main embankment	Un-Managed breach in main embankment
Up to and including Construction	N/A	£8.1M	£8.8M	£8.5M
Future Maintenance	N/A	£0.57M	£0.52M	£0.08M
Total (without risk)	N/A	£10.9M	£11.6M	£10.8M

➢Option 3 Present Day/ Year 1

➢Option 6 Present Day/ Year 1

- Option 100 Years
  - (also Option 3 100 Years)



Appraisal Summary Table

Coastal Partners

Draft summary scores (v1.3)

Appraisal Summary Table - Summary Scores			
Significant impact category	**Option 3 (Legal Baseline)**	**Option 5**	**Option 6**
Environmental	7	9	12
Technical	-5	1	9
Socioeconomic	-7	-11	-10
Total score	-5	-1	11

Top Scoring Option for Category

- Environment – mostly positive impact
- Socioeconomic – mostly negative
- Technical – more of a variety

- Work through areas where impact varies
- Confirm negative impacts
- Highlight areas where mitigation is required

Project ‘Uncertainties’

The following uncertainties or constraints have been identified through further investigation and stakeholder engagement, all of which are site specific factors:

The present day and future:

Risk of overtopping by sea water of the main embankment

- as realised through an Overtopping Assessment, and detailed topographic survey revealing low elevations across the site

Condition and residual life of the main embankment

- as realised through condition assessment

Arrangements for inspection and maintenance of the main embankment

- as realised through discussions with the Environment Agency

Project ‘Uncertainties’

The following uncertainties or constraints have been identified through further investigation and stakeholder engagement, all of which are site specific factors:

The present day and future:

Flood risk of the Hook Park Road bridge

- as realised during Storm Barra 2021, detailed topographic survey revealing low elevations, and flood risk modelling

Flood and erosion risk to the existing footpath network

- as realised through an Overtopping Assessment, detailed topographic survey revealing low elevations, Storm Events, and flood risk modelling

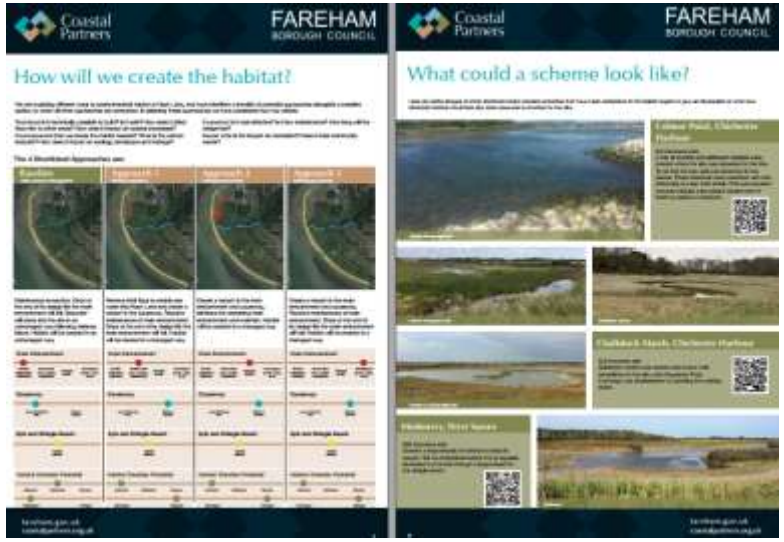
Risk of compound flooding

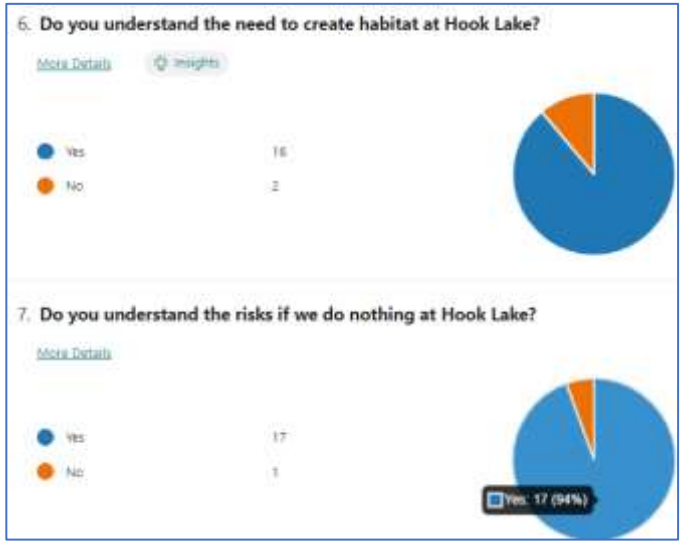
- whereby tide levels are high, the tide slice gates are closed, water overtops the main embankment (and/or shingle ridge) and freshwater input is high leading to flooding (as realised during Storm Barra 2021

Public Exhibition and Questionnaire

8. **Do you have any concerns about creating new habitat at Hook Lake?**

- No issues
- Changing landscape
- Impact on existing footpath net...
- Loss of existing freshwater habit...
- Other





Next Steps

Outline Programme Ahead

This Study

FEB'23
Leading Option

SPRING'23
Outline Design

SUMMER'23
Business Case

AUTUMN'23
Secure Funding

Detailed Design, Licencing and Consenting

23/24
'Detailed Design' Stage Commences

23/24
Work to reduce 'uncertainty'

24/25
Full Scheme Design Outputs

2025/26
Licence and Consenting

2025/26
Full Business Case

'26/27
Construction

Thank You

Any Questions?