

Ribble Estuary (I 1 b 1)



Recommendations:

Overview:

The long term vision for the areas at the mouth of the estuary, Southport to the south and Lytham to the north, is to continue to manage risks to the towns and their associated facilities, but achieving this as far as possible through maintaining the naturally functioning systems with minimal interventions. The nature of these systems suggests that this approach can be justified on social, economic and environmental grounds.

Within the Ribble and Douglas estuaries the long term plan is to establish a balance between protection of property, key infrastructure and industries, while creating more accommodation space where possible within the estuary systems. Consequently the recommended plan is for many existing flood defences to be maintained, but opportunities for managed realignment of present defence lines will be investigated. This may result in some loss of properties and agricultural land but this is balanced against reducing flood levels to larger communities and the need to provide compensatory natural habitats in the long term.

Location (Policy Unit)		Policy and Approach (from 2010)			Justification		
		0-20 years	20-50 years	50-100 years	Social	Environmental	Economic
I.1	Weld Road to Fairways (Southport)	Hold the Line – Manage coastal flood and erosion risk to Southport & associated facilities - Maintain defences as required.	Hold the Line – Manage coastal flood and erosion risk to Southport & associated facilities - Maintain defences as required.	Hold the Line – Manage coastal flood and erosion risk to Southport & associated facilities - Maintain defences as required.	Hold the Line maintains the integrity of Southport as a coastal resort, including promenade and existing seafront features.	Manages risk to Southport, associated heritage and conservation features and facilities including Marine Drive.	Hold the Line is robustly justified on economic grounds due to the high value of the assets at risk.
I.2	Fairways to Crossens Pumping Station	Hold the Line – Manage coastal flood and erosion risk to Southport & associated facilities - Maintain defences as required. Future plans would need to establish whether, the defences should be along the line of marine drive or behind the marshes.	Hold the Line – Manage coastal flood and erosion risk to Southport & associated facilities - Maintain defences as required.	Hold the Line – Manage coastal flood and erosion risk to Southport & associated facilities - Maintain defences as required.	Hold the Line maintains the promenade and existing seafront features and manages flood risk to Southport. Existing primary defence is the embankment landward of the Marshside reserve adjacent to assets. Marine Drive although not a formal defence helps establish a wide defence zone.	Coastal squeeze is not presently an issue due to foreshore accretion. The area between Marine Drive and the main defence line is a freshwater part of the SPA (Marshside reserve / Crossens Marsh). Future sea level rise may lead to more frequent / higher risk of coastal flooding and loss or damage to the important freshwater pools, which may require replacement.	Hold the Line has robust economic justification due to the high value of the assets at risk.
I.3	Crossens Pumping Station to Hesketh Out Marsh West (Hundred End Gutter)	Hold the Line – Manage flood risk by maintaining existing defences to an adequate standard.	Hold the Line – Manage flood risk by maintaining existing defences to an adequate standard. Undertake studies to investigate Managed Realignment opportunities in the long term and implement where practicable.	Managed Realignment – Seek opportunities to realign by building / improving set back defences where practicable.	Manages flood risk to high grade agricultural land and extensive flood plain.	The area is currently accreting, therefore coastal squeeze not expected to be an issue.	Proposed policy is economically justified. Long term consideration of defence alignment is required to provide the most cost effective and sustainable alignment with the neighbouring frontages.
I.4	Hesketh Outmarsh West	Hold the Line – Manage flood risk by maintaining existing defences landward of Hesketh Outmarsh to an adequate standard.	Hold the Line – Manage flood risk by maintaining existing defences to an adequate standard. Undertake studies to investigate Managed Realignment opportunities in the long term and implement where practicable.	Managed Realignment – Seek opportunities to realign by building / improving set back defences where practicable.	Manages flood risk to high grade agricultural land and extensive flood plain.	This frontage has been realigned recently. However, in long term further Managed Realignment could create additional areas of habitat creation to mitigate the effects of coastal squeeze elsewhere on the coastline.	Proposed policy is economically justified. Large area of agricultural land and isolated settlements at flood risk justify the cost of the defences.

Location (Policy Unit)		Policy and Approach (from 2010)			Justification		
		0-20 years	20-50 years	50-100 years	Social	Environmental	Economic
1.5	Hesketh Outmarsh East	Managed Realignment – Seek opportunities to build / improve secondary defences.	Hold the Line – Manage flood risk by maintaining new set back defences to an adequate standard.	Hold the Line – Manage flood risk by maintaining realigned defences to an adequate standard.	Manages flood risk to high grade agricultural land and extensive flood plain.	Managed Realignment of private front line defences could create large habitat creation opportunities and may reduce surge water levels in the upstream areas. Realigning the defences on the estuary bank would create a more sustainable alignment with the neighbouring frontages.	No economic justification for national expenditure on the front line defences. Proposed policy to hold the line at the already adopted rear defence is economically justified. This is a shorter and a more sustainable defence alignment.
1.6	Hesketh Outmarsh East to White Bridge, Rufford (River Douglas left bank)	Hold the Line – Manage flood risk by maintaining existing defences to an adequate standard.	Hold the Line – Manage flood risk by maintaining existing defences to an adequate standard. Seek opportunities to build set-back defences / retreat to high land where practicable.	Managed Realignment – Seek opportunities to build set-back defences / retreat to high land where practicable.	Hold the Line at the existing defences will continue to reduce flood risk to several main roads, settlements and canals.	Hold the Line at the existing defence alignment will maintain the current stability of the estuary.	Policy is economically viable, and there are locations where shorter & cheaper defence alignments could be considered when defences need upgrading in future.
1.7	White Bridge, Rufford, to Old Railway Embankment, Much Hoole Marsh House (River Douglas right bank)	Hold the Line – Manage flood risk by maintaining existing defences to an adequate standard.	Hold the Line – Manage flood risk by maintaining existing defences to an adequate standard. Seek opportunities to build set-back defences / retreat to high land where practicable.	Managed Realignment – Seek opportunities to build set-back defences / retreat to high land where practicable.	Defences will continue to reduce flood risk to several main roads, settlements and canals.	Hold the Line at the existing defence alignment will maintain the current stability of the estuary channels in the downstream reaches.	Policy is economically viable, but there are locations where shorter & cheaper defence alignments could be considered when defences need upgrading in future.
1.8	Old Railway Embankment, Much Hoole Marsh House to Hutton Marsh (Pilots Cottage)	Hold the Line – Manage flood risk by maintaining existing defences to an adequate standard.	Hold the Line – Manage flood risk by maintaining existing defences to an adequate standard. Seek opportunities to build set-back defences or retreat to high land where practicable.	Managed Realignment – Seek opportunities to build set-back defences or retreat to high land where practicable.	Managed Realignment in the long term may reduce surge water levels in the upstream areas.	By retreating to higher ground where possible, a more natural sustainable coastline is created with space to allow the extent of wetland habitat to increase. Managed realignment was selected as some control of flooding is required inland to manage flood risk at the landfill site.	Policy is robustly economically viable. Maintaining the existing defences until the end of their residual lives then retreating to higher ground where possible, provides the most cost effective scenario and eventually creates a more sustainable natural coastline. Existing alignment may not be economically justified.
1.9	Hutton Marsh	Managed Realignment – Seek opportunities to return Hutton Marsh to intertidal status and implement in this epoch if practicable.	Hold the Line – Manage flood risk by maintaining defences on the presently adopted alignment to rear of Hutton Marsh. Seek opportunities to build set-back defences or retreat to high land where practicable.	Managed Realignment – Build set-back defences or retreat to high land where practicable. Where realigned to high ground, no further intervention would be required.	Manages flood risk to agricultural land and properties in the flood risk area.	Sea defences on the estuary side of Hutton Marsh have been privately upgraded within the SPA, resulting in Hutton Marsh being removed from the intertidal zone, even though it is designated intertidal SPA. This part of the SPA is in unfavourable condition and managed realignment will bring this area back under tidal influence.	Policy is robustly economically viable and linked to Policy Unit 1.8.

Location (Policy Unit)		Policy and Approach (from 2010)			Justification		
		0-20 years	20-50 years	50-100 years	Social	Environmental	Economic
I.10	Hutton Marsh to Penwortham Golf Course	Hold the Line – Manage flood risk by maintaining existing defences to an adequate standard. Undertake studies to investigate Managed Realignment opportunities and implement where practicable.	Managed Realignment – By building / improving secondary defences or retreating to higher land, where practicable.	Hold the Line – At new alignment to manage flood risk. Where realigned to high ground, no further intervention would be required.	Managed Realignment in the medium term may reduce surge water levels in the upstream areas.	Realign to higher ground or limited set back defences provides most cost effective scenario and creates sustainable natural coastline and provides space for potential replacement / new habitat in long term.	Policy is economically viable. Limited justification for defending agricultural land. Retreating to higher land minimises the length of defence required therefore providing the most cost effective defence solution.
I.11	Penwortham Golf Course to Penwortham Bridge	Hold the Line – Manage flood risk by maintaining existing defences to an adequate standard.	Hold the Line – Manage flood risk by maintaining existing defences to an adequate standard.	Hold the Line – Manage flood risk by maintaining existing defences to an adequate standard.	Manage flood risk to main roads, sports grounds and large area of allotments.	Manages risk to Lower Penwortham. Realignment of defences could potentially impact adversely on downstream morphology.	The economic viability of the policy may depend on the amenity value of the large area of allotments and avoidance of traffic disruption. (See note 1 below).
I.12	Penwortham Bridge to Freckleton Marsh (West end of sewage works)	Hold the Line – Manage flood risk by maintaining existing defences to an adequate standard. Investigate small Managed Realignment / habitat creation opportunity at Lea Marsh and implement if practicable.	Hold the Line – Manage flood risk by maintaining existing defences to an adequate standard.	Hold the Line – Manage flood risk by maintaining existing defences to an adequate standard.	Manages risk to Preston.	Hold the Line manages risk to the landfill sites preventing future pollution and contamination issues. Potential small Managed Realignment / habitat creation opportunity at Lea Marsh.	The economic viability of the policy may depend on the cost of defending or relocating contaminated land to avoid pollution in combination with the high value of the assets at risk. (See note 1 below).
I.13	Freckleton Marsh (West end of sewage works) to Naze Point	Hold the Line – Manage flood risk by maintaining existing defences to an adequate standard	Hold the Line – Manage flood risk by maintaining existing defences to an adequate standard. Undertake studies to investigate Managed Realignment opportunities in the long term and implement where practicable.	Managed Realignment – Seek opportunities to build set-back defences where practicable.	Manages risk to sewage works and agricultural land in the flood zone.	An area of potential replacement habitat could be created in the future if deemed feasible following investigation into coastal processes and implications at estuary mouth.	Economic viability of this policy may be improved by the value of potential habitat creation to mitigate potential losses elsewhere. (See note 1 below).
I.14	Naze Point to Warton Bank	No Active Intervention – No new defences will be constructed in the future.	No Active Intervention – No new defences will be constructed in the future.	No Active Intervention – No new defences will be constructed in the future.	Insufficient assets at risk to justify expenditure on shoreline defences.	No Active Intervention provides a naturally functioning and sustainable frontage without putting assets at risk.	Limited assets at risk, shoreline defences unlikely to be economically justified.
I.15	Warton Bank to Lytham Dock	Hold the Line – Manage flood risk by maintaining the existing defences to an adequate standard where present.	Hold the Line – Manage flood risk by maintaining the existing defences to an adequate standard where present.	Hold the Line – Manage flood risk by maintaining the existing defences to an adequate standard where present.	Manages risk to properties and main road	Holding the line may lead to coastal squeeze in long term epoch	Policy is robustly economically justified due to the high value of assets at risk
I.16	Lytham Dock to Land Registry	Hold the Line – Manage flood risk by maintaining the existing defences to an adequate standard where present.	Hold the Line – Manage flood risk by maintaining the existing defences to an adequate standard where present.	Hold the Line – Manage flood risk by maintaining the existing defences to an adequate standard where present.	Manages risk to communities and amenities in Lytham.	Manages risk of pollution from historical landfill.	Hold the Line is robustly economically viable due to the high value of the assets at risk.

Location (Policy Unit)		Policy and Approach (from 2010)			Justification		
		0-20 years	20-50 years	50-100 years	Social	Environmental	Economic
I.17	Lytham Land Registry to Fairhaven Lake	Hold the Line – Manage flood risk by maintaining the existing defences to an adequate standard where present.	Hold the Line – Manage flood risk by maintaining the existing defences to an adequate standard where present.	Hold the Line – Manage flood risk by maintaining the existing defences to an adequate standard where present.	Managed risk to communities and amenities in Lytham. Promenade will be maintained as an amenity feature.	Habitat creation elsewhere in SMP2 may be required to offset potential coastal squeeze in long term epoch	Hold the Line is robustly economically viable due to the high value of the assets at risk.
I.18	Fairhaven Lake	Hold the Line – Manage flood risk by maintaining the existing defences to an adequate standard where present.	Hold the Line – Manage flood risk by maintaining the existing defences to an adequate standard where present.	Hold the Line – Manage flood risk by maintaining the existing defences to an adequate standard where present.	Fairhaven Lake will be maintained as a public amenity on the seafront	Habitat creation elsewhere in SMP2 may be required to offset potential coastal squeeze in long term epoch	Economic viability of this policy may depend on the regional importance of Fairhaven Lake. (See Note I below).
I.19	Fairhaven Lake to Miniature Golf Course	Hold the Line – Manage flood risk by maintaining the dunes as a natural defence through dune management. Undertake study to consider flood risks due to breach of dunes during storms.	Hold the Line – Manage flood risk by maintaining the dunes as a natural defence through dune management.	Hold the Line – Manage flood risk by maintaining the dunes as a natural defence through dune management.	Visual character of the seafront will be maintained by managing the existing dune systems.	Dune management practices will maintain the natural dune system as both a habitat and means of defence	Dune management should provide most cost effective means of defence. Economic viability of this policy may require further assessment of tourism and social benefits at strategy level. (See Note I below).
I.20	Miniature Golf Course to St Anne's Pier	Hold the Line – Manage flood risk by maintaining the existing defences to an adequate standard where present. Undertake study to consider flood risks due to breach of dunes during storms.	Hold the Line – Manage flood risk by maintaining the existing defences to an adequate standard where present.	Hold the Line – Manage flood risk by maintaining the existing defences to an adequate standard where present.	Tidal flood risk behind dunes in event of breach may be greater than mapped.	Habitat creation elsewhere in SMP2 may be required to offset potential intertidal habitat losses due to coastal squeeze in long term epoch	Economic viability of this policy may require further assessment of tourism and social benefits at strategy level. (See Note I below).
I.21	St Annes's Pier to St Annes' Northern Boundary	Hold the Line – Manage flood risk by maintaining the existing hard defences to an adequate standard where present, or by dune management elsewhere.	Hold the Line – Manage flood risk by maintaining the existing hard defences to an adequate standard where present, or by dune management elsewhere.	Hold the Line – Manage flood risk by maintaining the existing hard defences to an adequate standard where present, or by dune management elsewhere.	Visual character of the seafront will be maintained by managing the existing dune systems.	Dune management practices will maintain the natural dune system as both a habitat and means of defence.	Hold the Line is economically viable. Dune management provides most cost effective means of defence.

Key assumptions made during development

Changes to the low water channels have a major control on the estuary processes and defence management in the estuary. It has been assumed that the position of these channels will continue to influence patterns of accretion and erosion in the future. Predicted changes in rainfall patterns with future climate change may increase river flows which may in turn affect river channel meandering and siltation rates.

The supply of sediment to the estuary will continue and will allow the estuary to accrete vertically in line with sea level rise. This assumption is consistent with the past history of the estuary which has shown accretion. In the long term there is uncertainty over the balance between sediment supply and sea level rise. It has been assumed that supply will continue to allow vertical accretion within the estuary although the horizontal expansion of marsh habitats may have decreased or even cease. If sediment supply were not to keep pace with sea level rise in the long term then roll back of the estuary could occur, which would be expected to lead to coastal squeeze in locations where the high water mark abuts the defences.

Contamination risks are uncertain; therefore future studies will be required to address these uncertainties.

Management of defences in the outer estuary will be closely linked with the management of the adjacent open coast frontages due to shared flood risk issues and sediment supply.

The long term flood risk management policy for this estuary, as with others in the North West may change if proposals for tidal power barrages are progressed.

The key uncertainty concerns the detailed alignment of future set-back defences and the implications of this managed realignment on coastal processes in the Ribble Estuary. Potential areas of realignment along the estuary will need to be carefully considered after exploring the influence on changes to tidal propagation.

Economic justification needs to be examined in more detail at strategy level and opportunities for co-funding need to be investigated.

The SMP policies will be subject to review if sea level rise predictions are changed.

Note I: Policy delivery in the noted frontages may be compromised by funding prioritisation due to the low Benefit Cost Ratio and therefore opportunities for co-funding need to be investigated.

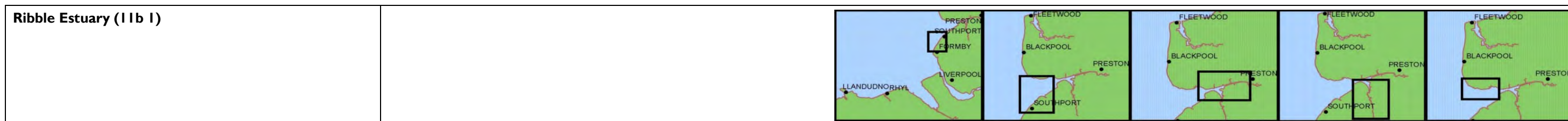
Ribble Estuary (I1b I)



Predicted Implications of the Policies being Adopted in this Location:

Time period from 2010	Property and population	Land use, infrastructure and material assets	Amenity and recreational use	Historic environment	Landscape character and visual amenity	Earth heritage, soi, and geology	Water	Biodiversity, flora and fauna
0-20 years	<ul style="list-style-type: none"> + Manages risk to residential and commercial properties. 	<ul style="list-style-type: none"> + Manages risk to infrastructure and material assets from flooding. - Potential loss of agricultural land (including Grade I) in some areas under managed realignment, depending on realignment extents + Manages risk to agricultural land elsewhere 	<ul style="list-style-type: none"> + Manages risk to recreational and tourist assets (e.g. in Preston, Lytham St Anne's and Southport) 	<ul style="list-style-type: none"> + Manages flood and erosion risk to heritage features and conservation areas from flooding and erosion. 	<ul style="list-style-type: none"> ● No designated landscapes within the scenario area. 	<ul style="list-style-type: none"> ● No significant impacts 	<ul style="list-style-type: none"> ● No known impacts on chemical and biological water quality. + Manages risk to landfill sites and thus no release of contaminants into the estuary. 	<ul style="list-style-type: none"> + Manages risk to lowland neutral grassland within designated conservation sites + Potential creation of new intertidal habitats in managed realignment areas adjacent to designated conservation sites. - Potential loss of grassland habitat in realigned areas
20-50 years	As Above	As Above	<ul style="list-style-type: none"> ● Potential loss of sections of the Ribble Way under managed realignment i.e. some parts defended; losses in other areas (may be negative or positive impact). 	As Above	As Above	<ul style="list-style-type: none"> ● Potential impacts on geological interest features of the Lytham Coastal Changes SSSI, however, the site is currently in favourable condition. Impact uncertain. 	As Above	As above,;
50-100 years	<ul style="list-style-type: none"> - Potential loss of isolated properties in areas of managed realignment 	<p>As Above plus</p> <ul style="list-style-type: none"> - Potential loss of local access roads in areas of where managed realignment; dependent on extent - Potential impacts on drainage systems between Crossens Pumping Station and Hesketh Out Marsh West with associated effects on Crossens Marshes 	As Above	As Above	As Above	As Above	As Above	<p>As above, plus:</p> <ul style="list-style-type: none"> ● Potential for loss of intertidal habitat within present site boundaries of Sefton Coast SAC & SSSI and Ribble & Alt Estuaries SPA & Ramsar and Ribble Estuary SSSI, but overall habitat gains through managed realignment.

Impact colour key	+ Positive	● Neutral	- Negative
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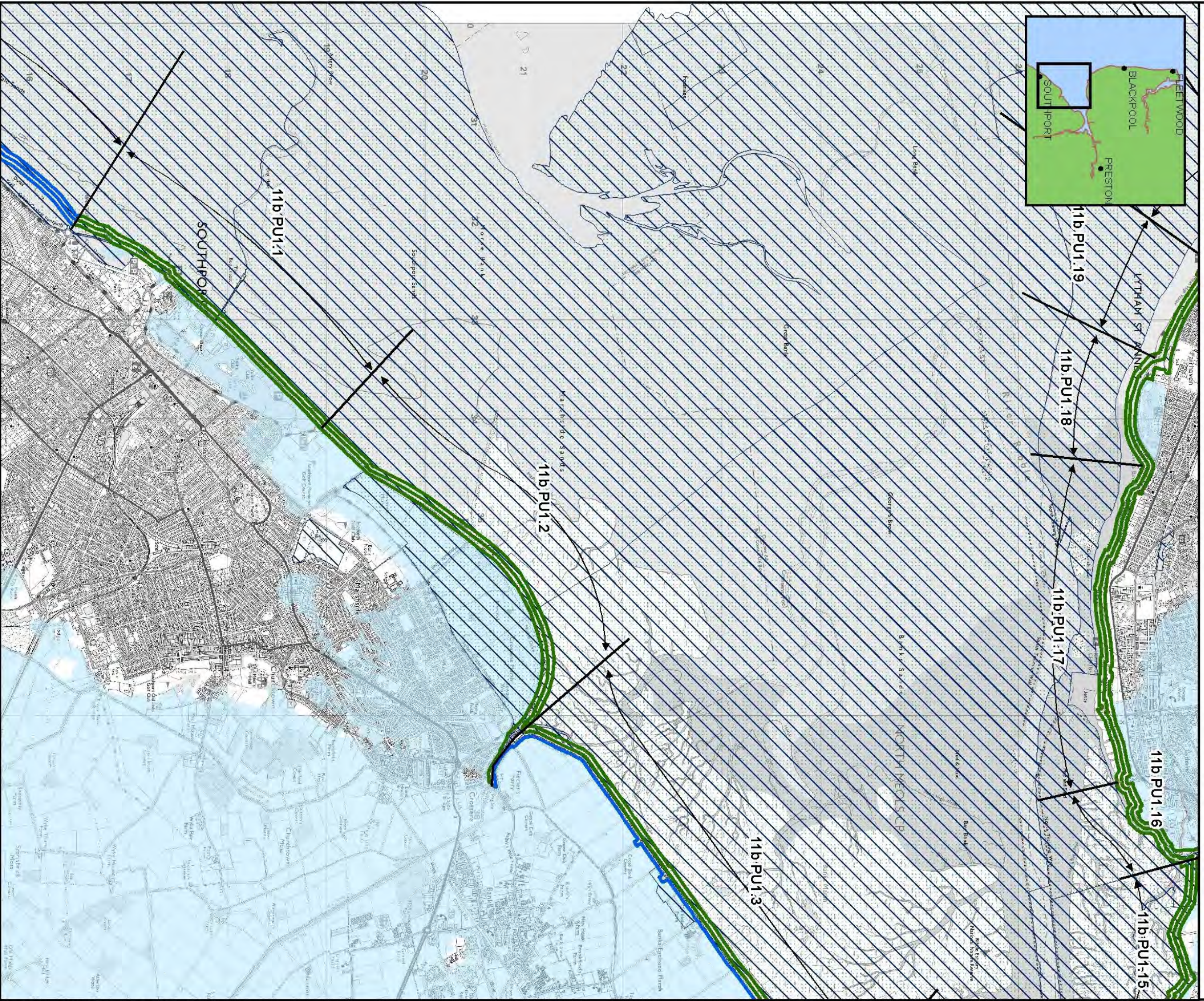
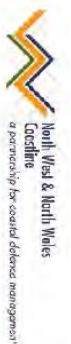
ACTION PLAN						
Action	Action Ref	Action Description (to be approved)	Potential source for funding (subject to approval)	Lead authority and key partners	To start by (subject to funding)	Outcome
1. Studies for scenario area	1.1	Undertake estuary wide studies to investigate various Managed Realignment opportunities in medium to long term and develop plans to implement where practicable to create a more sustainable defence alignment. Include coastal processes and habitats study; stakeholder consultation, more detailed economic appraisal; consideration of options for adapting paths and rights of way to coastal change. Assess needs for intervention to manage land drainage in areas where saltmarsh accretion causes problems at outfalls.	EA	EA, SC, NE	2013 - 2018	Extent of managed realignment area confirmed, habitat gains by type and preferred technical approach to realignment assessed. Outputs from study linked to RHCP.
2. Studies for Policy Units:						
PU 1.1	2.1	Develop a Beach management plan for Southport Frontage to maintain amenity value of the beach in the most cost effective and sustainable manner.	EA	SC, NE	2013-2016	Sustainable Management.
PU 1.2	2.2	Assess tidal flood risks for Marshside & Crossens marsh, including revised Sea Level Rise estimates and consider coastal adaptation requirements.	EA	SC, RSPB, EA	2013-2016	Sustainable Management.
PU 1.3	2.3	Consider undertaking studies to assess the flood risk to Banks and potential for reinstating old sea wall as a secondary line of defence, together with medium to longer term options for managed realignment.	EA	EA	2015	Management of flood risk.
PU 1.5	2.4	Seek opportunities to build / improve secondary defences at Hesketh Outmarsh East to North East corner of Hesketh Outmarsh to achieve a more sustainable defence alignment and facilitate habitat creation.	EA, LO	EA	2011 – 2014	Extent of managed realignment area confirmed, habitat gains by type and preferred technical approach to realignment assessed.
PU 1.6, 1.7 & 1.8	2.5	Investigate managed realignment opportunities for the medium and long term. Consider the hazard that the landfill sites poses to people and the environment from leaching or the release of contaminated materials if defences realigned. Where necessary, consider protection in situ or excavation and removal of material.	EA	EA	2025	Extent of managed realignment confirmed and identify landfill content and assessed risk of SMP2 policy implementation upon WFD objectives.
PU 1.9	2.6	Consult with landowners and Preston and District Wildfowling Association over future management of Hutton Marsh and practicality of managed realignment to improve the condition of the internationally designates site in the short term, taking account of the conservation objectives of the site.	EA, PDWA	EA, NE	2011	Stakeholder agreement on any works necessary for management of the Natura 2000 sites. Habitat gains or mitigation needs recognised in RHCP.
PU 1.12	2.7	Investigate environmental opportunities for habitat improvement / creation at Lea Marsh	EA	EA	2013 – 2016	Options identified for potential habitat improvements.
PU 1.13	2.8	Undertake studies to investigate Managed Realignment opportunities in the medium to long term. Investigate the hazard that the landfill site poses to people and the environment from leaching or the release of contaminated materials. Where necessary, consider protection in situ or excavation and removal of material.	EA	EA	2015 - 2018	Extent of managed realignment confirmed and identify landfill content and assessed risk of SMP2 policy implementation upon WFD objectives.
PU 1.14 to 1.21	2.9	Joint Blackpool and Fylde Shoreline Strategy for coastal flood and erosion risk management on Blackpool & Fylde coastline (Naze Point to Anchorsholme)	EA	BC, FBC, EA, NE	2012	Strategy Appraisal Report and programme of works approved by EA.
PU 1.18	2.10	Depending on strategy review, undertake project appraisal for Fairhaven Lake Coast Protection Scheme followed by detailed design & construction.	EA	FBC, EA	2015	Project Appraisal Report approved by EA.
PU 1.21.	2.11	Undertake study to update the impact assessment of the commercial sand extraction from Salters Bank / inter tidal flats to inform next licence renewal. The study should consider long term impacts on coastal defences and designated habitats in relation to increasing risks due to sea level rise.	FBC	FBC, BC, EA	2011 – 2014	Risks to flood and erosion and impacts on Natura 2000 sites updated and stakeholders advised.
PU 1.19 to PU 1.21	2.12	Revise flood maps to take account of potential for breach of the dunes.	EA	EA	2011 – 2014	Flood maps updated
PU 1.19 to PU 1.21	2.13	Develop Dune Management Action Plan to define actions necessary to maintain conservation features of dunes whilst providing natural coastal defence, including management of flood risks from cuttings and / or access routes through the dunes.	EA	FBC, BC, EA, NE	2011	Completed and now adopted by FBC.

Action	Action Ref	Action Description (to be approved)	Potential source for funding (subject to approval)	Lead authority and key partners	To start by (subject to funding)	Outcome
3. Strategy	3.1	Develop estuary flood risk management strategy taking into account the estuary wide and policy unit studies above to provide more detailed proposals on approaches to the delivery of policy across the estuary and a programme of actions to deliver it. The estuary strategy needs to link to the open coast strategy being developed between Anchorsholme and Naze Point.	EA	EA, SC, WLBC, FBC	2015 – 2018	Strategy approved by EA..
4. Scheme Work	4.1	To be defined by strategy.	EA	EA, SC, FBC	ongoing	Actions identified in Long Term Plan.
5. Monitoring (Data Collection)	5.1	Undertake estuary, coastal defence and dune asset monitoring in conjunction with Cell 11 Regional Monitoring Strategy to inform strategy and future SMP reviews.	EA	SC, EA	ongoing	Data provided to CERMS provides improved evidence base for future decision making
	5.2	Environmental monitoring of designated conservation sites to provide baseline data for future Habitat Regulations Assessments (see Action 12.1).	NE	NE	ongoing	
6. Asset Management	6.1	Maintenance of defences and beach and dune management including management of public access.	EA, LO	EA, SC, LO WLBC, FBC	ongoing	Maintenance undertaken to required standards.
7. Communication	7.1	Undertake consultation with key stakeholders and general public during strategy development.	EA	EA, SC, WLBC, FBC	ongoing	Public participation.
	7.2	Monitoring and management of Action Plans to ensure SMP policies are put into practice.	n/a	NWNWCG	ongoing	NWNWCG reports on progress.
8. Interface with Planning and Land Management	8.1	Advise local Planning Authority about SMP policies and flood and erosion risks so they can be accounted for in the next revisions of land use plans in order to help manage residual risks from flooding and erosion.	n/a	SC / FBC / WLBC, EA	ongoing	Coastal flood risks considered in land use plans.
	8.2	Advise local Planning Authority about SMP policies and flood and erosion risks so they can take due account in planning decisions and aim to reduce the need to manage flood risk in future.	n/a	SC / FBC / WLBC, EA	ongoing	Coastal flood risks considered in planning decisions.
9. Emergency Response	9.1	Development, monitoring and review of emergency response plans to prepare for over design standard events.	n/a	SC / FBC / WLBC, EA	ongoing	Coastal flood risks considered in emergency plans.
10. Adaptation/Resilience	10.1	Investigations for recommended for managed realignment see items 1.1, 2.3, 2.5. & 11.1.				
	10.2	Monitor proposals for tidal power embayment's and barrages and build into next review of Shoreline Management Plan.	n/a	EA	2015	Integrated approach to shoreline management.
11. Flood Forecasting and Warning	11.1	Continue to improve flood risk maps and inundation risk modelling to improve flood warning service and raise awareness of flood risk, particularly in areas where there are dunes and promenades and areas benefiting from these defences are not currently shown.	EA	EA	ongoing	Improved flood warnings and risk mapping, raising awareness of coastal risks.
12. Habitat Creation and environmental mitigation	12.1	Monitor progress with dune management in PU 1.20 & 1.21, and habitat creation in areas of Managed Realignment.	n/a	NE, EA, FBC	ongoing	Improved evidence base for decision making.
	12.2	Investigate and quantify habitat losses and creation potential to feed into the RHCP and subsequently identify and secure intertidal habitat through the RHCP, if necessary to compensate for any habitat losses in the long-term.	EA	EA, FBC	ongoing	Meet legal requirements.

NB. Activities from SMP will be carried forward into medium term plans and carried out on a priority basis, subject to funding and approval n/a = activity is part of authorities general duties, not funded through flood and erosion risk management routes.
EA = Environment Agency; FBC = Fylde Borough Council; LO – land owners; NE = Natural England; NWNWCG = North West and North Wales Coastal Group; PDWA = Preston and District Wildfowlers Association; RHCP = Regional Habitat creation Programme; SC = Sefton Council, WLBC = West Lancashire Borough Council

North West England and North Wales Shoreline Management Plan 2

Sub-Cell 11b: Area: 1 Map: 1



Legend

- National Nature Conservation Designations
- International Nature Conservation Designations
- Scheduled Monuments
- Coastal flood risk area under extreme events, Environment Agency Flood Map 2008

Shoreline Management Policies

- Hold the Line (HTL)
- Managed Realignment (MR)
- No Active Intervention (NAI)
- Policy Unit Boundary
- Policy Unit Extent

Shoreline Management Policies

- Hold the Line (HTL)
- Managed Realignment (MR)
- No Active Intervention (NAI)

Policy Unit Boundary

Policy Unit Extent

From 2010

- 0 - 20 years
- 20 - 50 years
- 50 - 100 years

Note that the policy lines on the map show the preferred shoreline management policy for each period and do not represent either the shoreline or defence location

Malcrow

Scale: 1:35,000

0 0.25 0.5 1 Kilometres

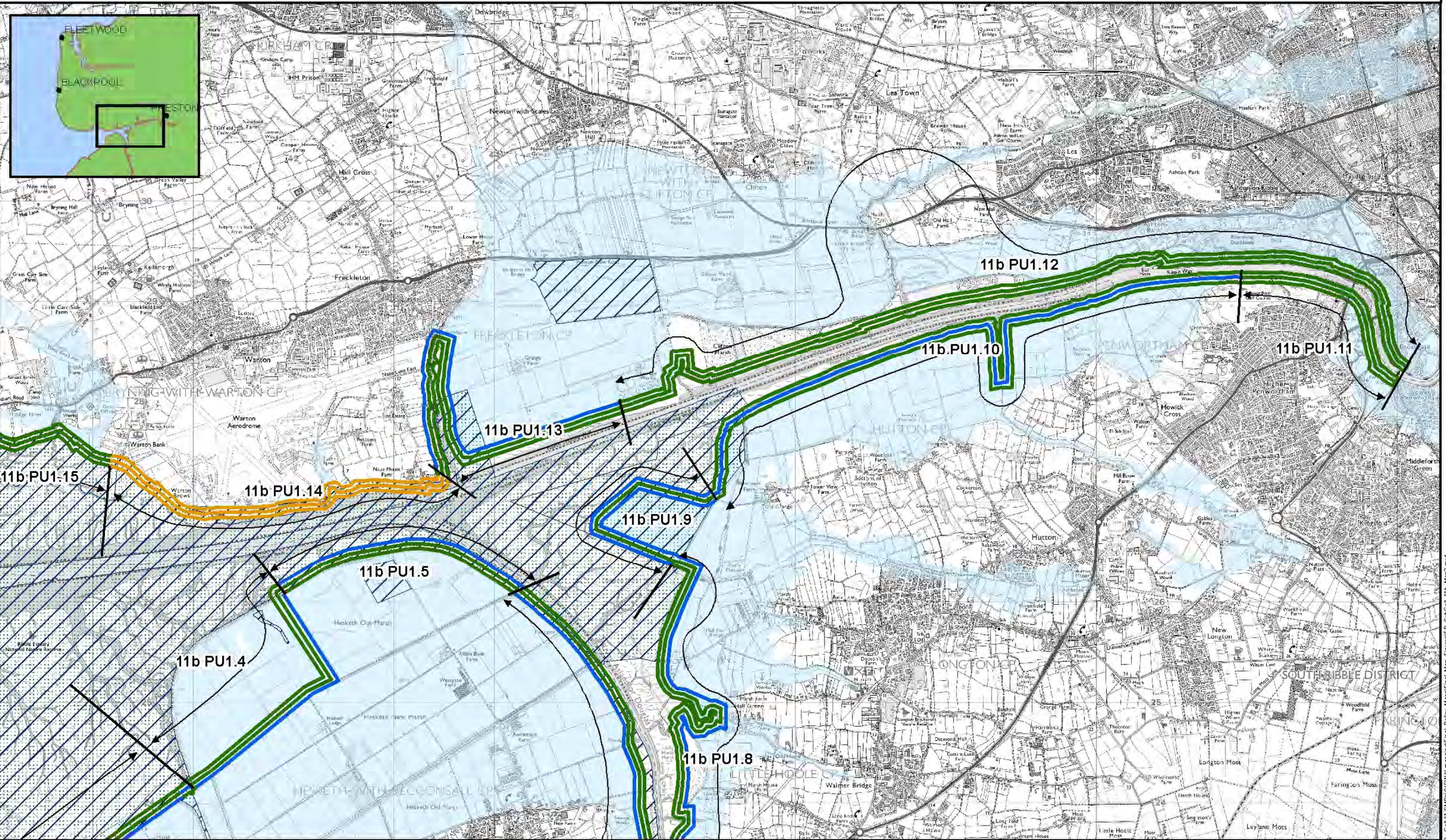
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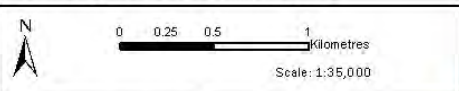
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North West England and North Wales Shoreline Management Plan 2

Sub-Cell 11b: Area: 1 Map: 2



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- Legend**
- National Nature Conservation Designations
 - International Nature Conservation Designations
 - Scheduled Monuments

- Coastal flood risk area under extreme events, Environment Agency Flood Map, 2008
- Policy Unit Boundary
- Policy Unit Extent

- Shoreline Management Policies**
- Hold the Line (HTL)
 - Managed Realignment (MR)
 - No Active Intervention (NAI)

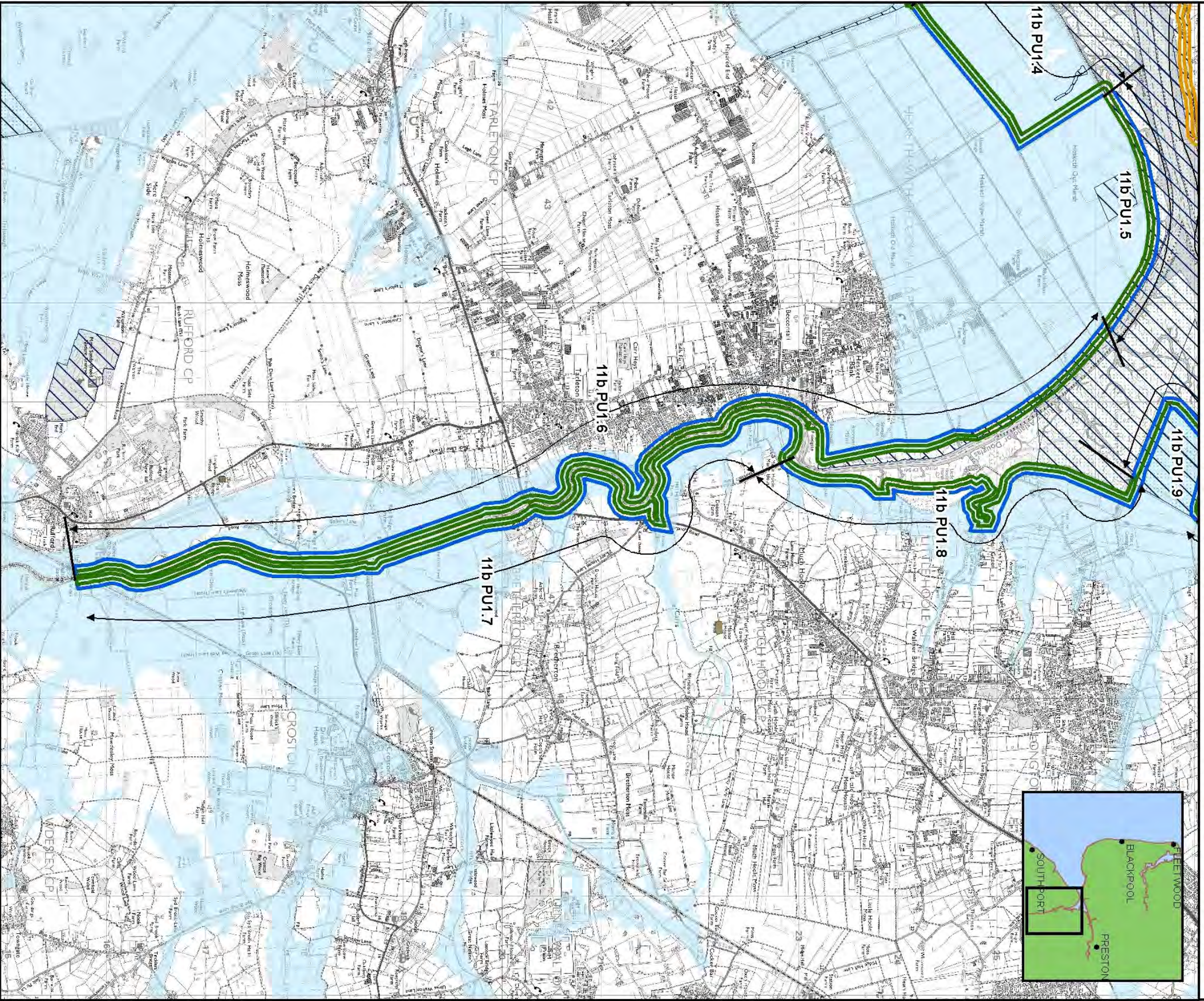
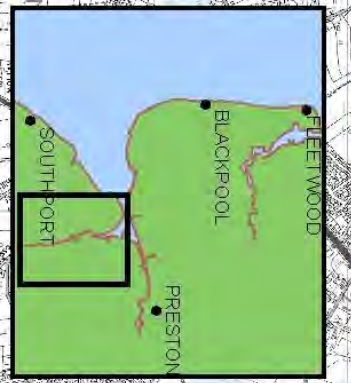
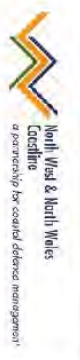


Note that the policy lines on the map show the preferred shoreline management policy for each period and do not represent either the shoreline or defence location.



Boxes showing cumulative erosion estimates represent the expected minimum and maximum erosion distance from the shoreline position in 2010. They are only shown where there is a NAI policy and coastal erosion is the main risk

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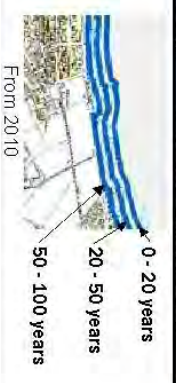


Legend

- National Nature Conservation Designations
- International Nature Conservation Designations
- Scheduled Monuments
- Coastal flood risk area under extreme events, Environment Agency Flood Map 2008

Shoreline Management Policies

- Hold the Line (HTL)
- Managed Realignment (MR)
- No Active Intervention (NAI)
- Policy Unit Boundary
- Policy Unit Extent



Note that the policy lines on the map show the preferred shoreline management policy for each period and do not represent either the shoreline or defence location

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Scale: 1:35,000

0 0.25 0.5 1 Kilometres

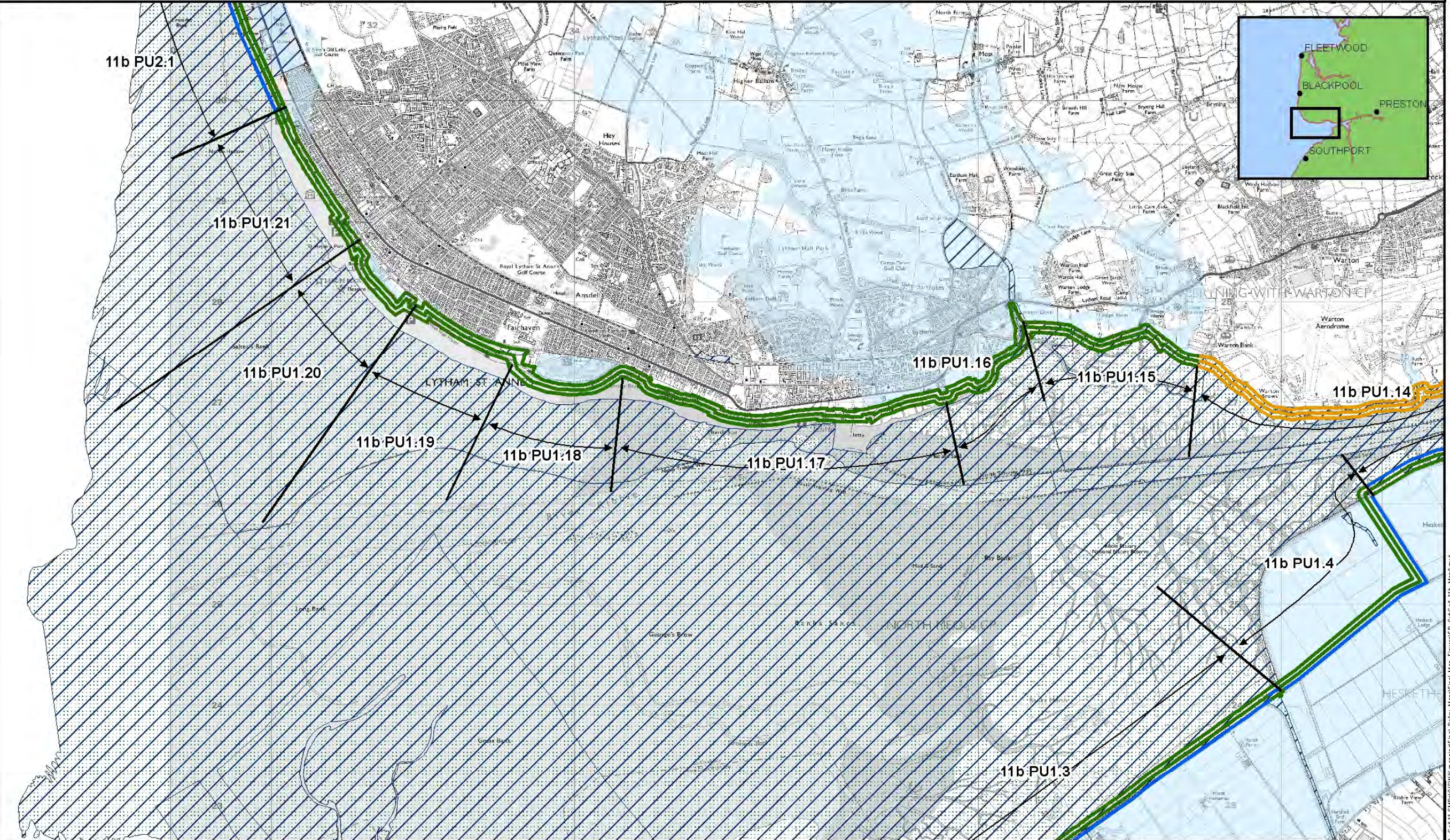
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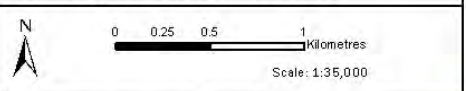
Boxes showing cumulative erosion estimates represent the expected minimum and maximum erosion distance from the shoreline position in 2010. They are only shown where there is a NAI policy and coastal erosion is the main risk

North West England and North Wales Shoreline Management Plan 2

Sub-Cell 11b: Area: 1 Map: 4



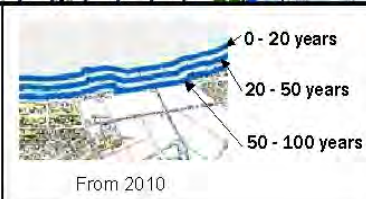
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- Legend**
- National Nature Conservation Designations
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- Coastal flood risk area under extreme events, Environment Agency Flood Map, 2008
- Policy Unit Boundary
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- Shoreline Management Policies**
- Hold the Line (HTL)
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 - No Active Intervention (NAI)



Note that the policy lines on the map show the preferred shoreline management policy for each period and do not represent either the shoreline or defence location



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