Angus Council

Angus Shoreline Management Plan SMP2

Appendix E – Issues and Objectives Evaluation

Montrose, 2012

Contents Amendment Record

This report has been issued and amended as follows:

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1	0	For Consultation	March 2015	SB/CM	JY	JY
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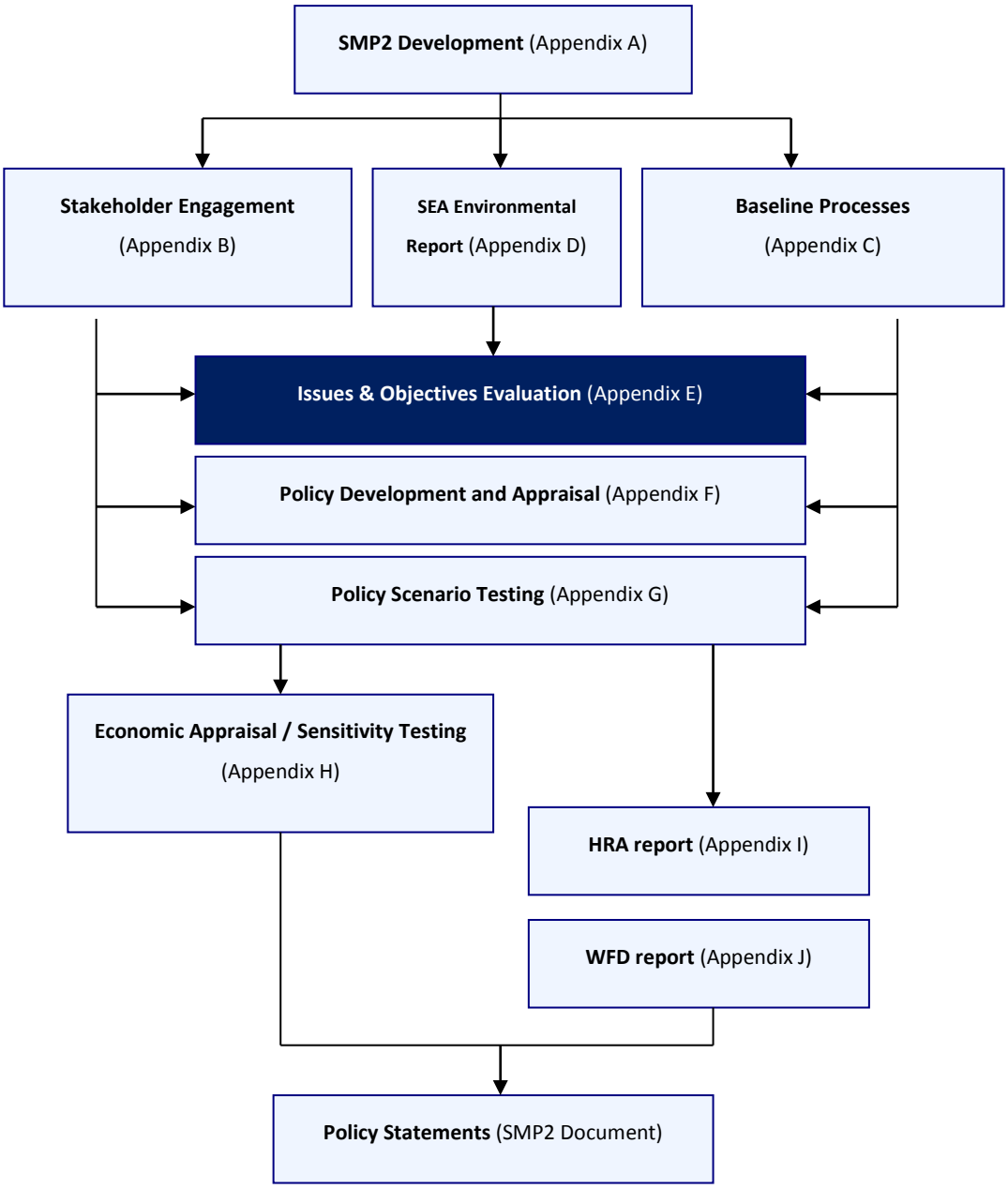
The Supporting Appendices

These appendices and the accompanying documents provide all of the information required to support the Shoreline Management Plan. This is to ensure that there is clarity in the decision-making process and that the rationale behind the policies being promoted is both transparent and auditable. The appendices are:

A: SMP2 Development	This reports the history of development of the SMP2, describing more fully the plan and policy decision-making process.
B: Stakeholder Engagement	All communications from the stakeholder process are provided here, together with information arising from the consultation process.
C: Baseline Process Understanding	Includes baseline process report, defence assessment, NAI and WPM assessments and summarises data used in assessments.
D: Strategic Environmental Assessment (SEA) Environmental Report	This report identifies and evaluates the baseline environmental features (human, natural, historical and landscape) and presents an overview of the environmental assessment process, showing how the requirements of the EU Council Directive 2001/42/EC (the Strategic Environmental Assessment Directive) are met.
E: Issues & Objectives Evaluation	**Provides information on the issues and objectives identified as part of the Plan development, including appraisal of their importance.**
F: Policy Development and Appraisal	Presents the consideration of generic policy options for each frontage, identifying possible acceptable policies, and their combination into 'scenarios' for testing. Also presents the appraisal of impacts upon shoreline evolution and the appraisal of objective achievement.
G: Policy Scenario Testing	Presents the policy assessment and appraisal of objective achievement towards definition of the Preferred Plan (as presented in the Shoreline Management Plan document).
H: Economic Appraisal and Sensitivity Testing	Presents the economic analysis undertaken in support of the Preferred Plan.
I: Habitats Regulations Assessment	Presents an assessment of the effect the plan will have on European sites.
J: Water Framework Directive Assessment	Presents the Water Framework Directive assessment of the potential hydromorphological changes and consequent ecological impact of the preferred SMP2 policies.
k: Metadatabase and Bibliographic database	All supporting information used to develop the SMP2 is referenced for future examination and retrieval.

Within each appendix cross-referencing highlights the documents where related appraisals are presented. The broad relationships between the appendices are illustrated below.



Contents

E1 Assessment of Issues and Objectives

E1.1 Introduction

In order to develop policies, there needs to be a clear understanding of the issues and objectives that will need to be addressed by future shoreline management. This report identifies the key issues and objectives for the coast between Milton Ness and Broughty Ferry and should be read in conjunction with the SEA Baseline Report - Theme Review (see **Appendix D**).

E1.1.1 Identification of features and issues

Features and related coastal erosion and flood risk issues were identified using the SEA Baseline Report (Theme Review - see **Appendix D**), a project site visit and additional information gathered as part of the Initial Consultation exercise with key stakeholders. The identification of key issues is therefore based on information made available to us at the time of writing this document. The tables also include a summary of key considerations for each region, which defines the key characteristics of an area and identifies potential areas of conflict, which will need to be considered when developing policies.

The inland boundary of the study area for this Shoreline Management Plan (SMP)2 is a slightly modified version of that used in the Angus SMP1, where the steering group identified a landward boundary taking into consideration land use, the natural environment, historical and archaeological features as well as considering the SMP objectives. In line with new sea level rise predictions (UKCP 09), flood risk extents have changed from those used in SMP1and consequently the inland SMP2 boundary has been updated to include those areas at potential risk of coastal flooding over the SMP2 100 year period.

The Angus coast has been sub-divided into 8 Coastal Process Units CPUs):

1. Milton Ness to Montrose Harbour
2. Montrose Basin
3. Scurdie Ness to Rickle Craig
4. Rickle Craig to Lang Craig
5. Lang Craig to Whiting Ness
6. Whiting Ness to West Haven
7. West Haven to Buddon Ness
8. Buddon Ness to Broughty Castle

E1.1.2 Definition of objectives

The setting of objectives helps to ensure both clarity and consistency across the SMP2 area, whilst the identification of why a feature is important and any potential issues associated with coastal erosion and flooding, helps us to understand how an objective may be achieved.

An objective defines a target or goal that the SMP2 aspires to in delivering the plan. However, it is important to understand that quite commonly there are conflicting objectives for a particular stretch of coast. Therefore it is likely that not all objectives will be or can be achieved at every location but

the aim of the SMP2 is to seek to provide a balanced plan, which considers people, nature, historic and socio-economic realities.

Using the Defra Shoreline Management Plan Guidance (2006[1]), Strategic Environmental Assessment (SEA) guidelines and through internal discussions, a list of objectives was developed and, using the issues identified, appropriate objectives were defined for each feature. Those objectives which relate to statutory requirements are shown in **shaded cells**.

The objectives defined in Table 1 cover broad 'high level' features that may influence policy decisions in coastal management and that can be used to adequately assess policy options. Some assets such as those associated with commercial dredging activities are unlikely to be affected by policy decisions in coastal management, and are therefore excluded from the Table 1 below.

E1.1.3 SMP2 Objectives

The major objective for the Angus coast, in common with all other parts of the coastline of the UK is to develop and implement sustainable coast defences in line with the governments Flood and Coastal Defence Policy, which is defined as:

"To reduce the risk to people and the developed and natural environment from flooding and coastal erosion by the provision of technically, environmentally and economically sound and sustainable defence measures"

With the primary focus on: "The protection of life and hence of urban areas."

Table 1 shows the generic SMP2 objectives that have been defined for the SMP2 Plan area. These have been redefined, building on the objectives identified in SMP1, and scoping out of SEA receptors not relevant to the SMP2. These objectives will provide a framework to develop and appraise sustainable policies in relation to risks from coastal flooding and erosion. The relevant SEA receptor to which the objectives relate, are shown in brackets.

[1] Defra, 2006. Shoreline Management Plan Guidance. Volume 1: Aims and Requirements. Volume 2: Procedures. Available from: http://www.defra.gov.uk/environ/fcd/guidance/SMP2 .htm

Table 1 SMP2 Management Objectives

Management Objective		Features covered by the objective (following scoping)
1.	To minimise coastal flooding and erosion risk and its impact on people, coastal land use and future development plans. *(Population and Human Health, Material Assets)*	Houses Vulnerable community facilities (e.g. surgeries, hospitals, aged persons homes, schools, churches, libraries, etc)
2.	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services. *(Material Assets)*	A, B and minor roads (where linkage is a key issue) East Coast railway lines and stations Pumping stations, sewage works and outfalls, Access for emergency services
3.	To support natural coastal processes and maintain and enhance the integrity of internationally designated nature conservation sites and the favourable condition of their interest features. *(Biodiversity, Flora and Fauna/, Water)*	Ramsar, SPA and SACs
4.	To maintain and enhance nationally designated conservation sites and their interest features. *(Biodiversity, Flora and Fauna)*	SSSI (biological and geological) and NNRs
5.	To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites. *(Biodiversity, Flora and Fauna)*	LNR SWT Nature Reserves RIGS GCRs
6.	To maintain and enhance features as a natural flood defence *(Water/Soil (Geology))*	Beaches Dune systems
7.	To support the achievement of good ecological and chemical status/potential under the EU WFD (W*ater)*	Surface and groundwater waterbodies
8.	To enhance the aesthetic and landscape quality of the coastline.	Key landscape features including wide sandy bays, estuaries and

Management Objective		Features covered by the objective (following scoping)
	(Landscape)	estuarine mudflats, sand dune systems and links, and maritime cliffs and rocks
9.	To minimise coastal flood and erosion risk to scheduled and other nationally, regionally or locally important archaeological and cultural heritage assets, sites and their setting. *(Cultural Heritage/Historic Environment)*	Scheduled Monuments Listed Buildings Non-designated archaeological sites of local importance
10.	To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities. *(Population/Human Health/Material Assets)*	Recreation and amenity facilities (visitor attractions, golf courses, caravan parks, bathing beaches, promenades, cycle routes, public footpaths, etc)
11.	To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management. *(Population/Material Assets/Biodiversity)*	
12.	To minimise coastal flood and erosion risk to industry, commercial and economic activities and Ministry of Defence land. *(Population/Material Assets)*	Businesses, factories, warehouses, areas identified for regeneration, military establishments and others key areas of employment MoD Exclusion Zones
13.	To minimise the impact of policies on marine operations and activities *(Material Assets/ Population)*	Ports and harbours, Access to the sea and navigation
14.	To minimise the impact of policies on fishing activity. *(Water/Biodiversity/Material Assets/Population)*	Commercial fishing grounds and shell fisheries
15.	To minimise coastal flood and erosion risk to agricultural land *(Soil/Population)*	Grades 1 – 3A Farmland

E1.1.4 Links to other plans and projects

The SMP2 represents the first 'tier' in the strategic coastal erosion and flood risk management process, providing the overall framework within which more detailed assessments of flood and erosion risk, such as strategy plans and coastal management schemes, can be carried out. These assessments cover smaller areas and so are generally better able to address local features of importance and local issues.

Planning

The SMP2 process aims to achieve an integrated approach to coastal management. The SMP2 's relationship with the land use (spatial) planning process is particularly important with links to both regional spatial strategies and local development frameworks (see Appendix D).

E1.2 CPU 1 Milton Ness to Montrose Harbour

Key Considerations

This stretch of coastline is characterised by mainly unprotected environmentally designated beach and dune systems to the north and the town of Montrose to the south. The natural northern section contrasts with the anthropogenically influenced frontage to the south where Montrose Golf Course, the Splash recreation area and the Glaxo industrial site are located. The River North Esk flows into the sea approximately midway along the frontage while the River South Esk channel and Port entrance borders the frontage to the south. Historically, sediment dredged from the River South Esk channel, on behalf of Montrose Port, has effectively been removed from the system by being disposed of outside of Montrose Bay. This CPU has strong links to recreation and tourism but is segregated from the natural and heritages sites at St Cyrus, which prevent conflict. A key driver along this frontage will be the continued protection of the Glaxo site, and assets at Montrose while maintaining the recreation beach and golf course. There are potential conflicts relating to erosion of the golf course and impacts of disposing port dredging outside of the system.

Strategic flood and coastal risk management measures proposed by the SMP must not constrain the achievement of good ecological and chemical status/potential for all waterbodies in the SMP area. Opportunities to deliver mitigation identified in the River Basin Management Plan's Programme of Measures should be sought, where possible, during development of the SMP.

CPU 1 Milton Ness to Montrose Harbour						
SEA Receptor	Location/ feature	Key issues and benefits	Objectives that apply	No Active Intervention Scenario		
				Short Term (2012-2032)	Medium Term (2032-2082)	Long Term (2082-2112)
Population and human health	Small settlement at Kinnaber	• Isolated residential properties	To minimise coastal flooding and erosion risk and its impact on people, coastal land use and future development plans.	Potential flood risk to isolated properties alongside the River North Esk channel.	Increased flood risk to isolated properties alongside the River North Esk channel.	Increased frequency of flood risk to isolated properties alongside the Riven North Esk channel.
	Montrose town, residential and industry	• Montrose Port provides import and export services for various agricultural and oil related businesses located within the area. • Approximately 40% of the annual port traffic is oil related	To minimise coastal flooding and erosion risk and its impact on people, coastal land use and future development plans. To minimise the impact of policies on marine operations and activities	Defences remain in the short term providing flood protection to Montrose town.	Failure and subsequent breach of defences would result in a high risk of large scale flooding of the low-lying areas of Montrose town, including Montrose Port, residential assets and industry.	There will be an increased risk of more frequent flooding to Montrose town and Port.
	GlaxoSmithKline	• Bounded to the south by the River South Esk, to the east by Montrose beach and to the north by a caravan park. • Comprises over 160 buildings with an estimated replacement value in the region of £250 Million. • The site employs approximately 720 staff, and is therefore, the major local employer in Montrose.	To minimise coastal flood and erosion risk to industry, commercial and economic activities and Ministry of Defence land.	The beach is expected to continue to afford erosion protection to the Glaxo site.	The beach is expected to continue to afford erosion protection to the Glaxo site. However, parts of the Glaxo site will be at risk of flooding from the west.	The beach is expected to continue to afford erosion protection to the Glaxo site, however if the beach erodes significantly the site will be at risk of erosion. There will be an increased risk of more frequent flooding to western parts of the Glaxo site.
	Bathing and recreational beach	• Montrose beach achieved Blue Flag status in 2004	To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities	Amenity value of the beach will reduce as the reflective nature of the defences at Splash, and coastal squeeze against these defences will result in narrowing of Montrose Beach.	Erosion of dunes following the failure of defences at Splash will release stored sediment to Montrose Beach. Access to the beach will however, be compromised.	Potentially no safe access to Montrose Beach due to failure of defences and erosion of dunes.
	Recreational facilities	• Two 18-hole golf courses in north of unit	To minimise coastal flooding and erosion risk to key recreation and	Continued loss of parts of the golf course on the eroding dunes.	Continued loss of parts of the golf course on the eroding dunes.	Continued loss of parts of the golf course on the eroding dunes.

CPU 1 Milton Ness to Montrose Harbour						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
		• Existing beach pavilion area refurbished in 1998 • Splash area with existing facilities upgraded to provide children's play area, paddling pool, refurbished café, small amusement arcade and additional car parking. • Amusements, pitch & putt at East links • Windsurfing at Montrose bay • Coastal walks along shoreline and Charleton and Kinnaber links	tourism assets and activities	Defences will continue to protect the Splash recreational area. Minimal flood risk to coastal walks.	Following defence failure, recreational facilities at Splash will be at risk of erosion. Flood risk to coastal walks will increase.	Splash recreational facilities will be lost. There will be an increased risk of more frequent flooding to coastal walks.
	Caravan Park	• Council run a caravan park catering for summer visitors. • Formal access to the beach		Defences will remain providing protection to the caravan park.	Following defence failure, erosion and flood risk to the caravan park.	There will be an increased risk of more frequent flooding to, and erosion of the caravan park.
Material Assets and Infrastructure	Navigation route to Montrose Harbour	• Need to maintain safe navigation and access to the harbour	To minimise the impact of policies on marine operations and activities	Assuming dredging does not take place, safe navigation and access to Montrose Harbour will be compromised.	As short term.	As short term.
	Minor access roads and car parks	• Provides access to settlements and some other locations along the coastline	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	Defences remain in the short term providing erosion protection to the Splash car park. Potential flood risk to minor access roads alongside the River North Esk channel and the access road to the car park at Nether Warburton.	Following defence failure, the car park at Splash and access road will be lost. Increased flood risk to minor access roads alongside the River North Esk channel and the access road to the car park at Nether Warburton.	Splash car park and access road will be lost. Increased frequency of flood risk to minor access roads alongside the Riven North Esk channel and the access road to the car park at Nether Warburton.
	Sewage outfall: St Cyrus (untreated) Montrose Water Treatment Works	• Primary sewage treatment located within the site of the old Montrose airfield. • All raw sewage for the Montrose area is now treated at this plant and effluent discharged into the South Esk. • Within the unit there are three sewage outfalls and one industrial outfall at GlaxoSmithKline. • Of the three outfalls, two of these are Combined Storm Overflows (CSOs).		Assets will continue to be protected by defences in the short term.	Assets will be at increased flood risk as defences fail.	Increased frequency of flood risk to infrastructure assets.
Historic Environment	Little Kinnaber and	• Crop mark sites identified by aerial	To minimise coastal flood and erosion	No adverse impacts in the short term	No adverse impacts in the medium	No adverse impacts in the long term

CPU 1 Milton Ness to Montrose Harbour						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
	Fisherhills Fort and Barrows Scheduled Monuments (SMs)	photography	risk to scheduled and other nationally, regionally or locally important archaeological and cultural heritage assets, sites and their setting.		term	
	Kinnaber House	• Listed building		No adverse impacts in the short term	No adverse impacts in the medium term	No adverse impacts in the long term
	Montrose Airfield and associated buildings	• Listed building		No adverse impacts in the short term	No adverse impacts in the medium term	No adverse impacts in the long term
Flora, fauna and biodiversity	St Cyrus and Kinnaber Links Site of Special Scientific Interest (SSSI)	• Notified for its coastal cliffs and dunes, vascular plants and lichens, breeding birds and insects	To maintain and enhance nationally designated conservation sites and their interest features. To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites	Flora and fauna in intertidal habitats (e.g. sand dunes) are likely to be maintained. However, potential flood risk to freshwater/terrestrial habitats and species.	Flora and fauna in intertidal habitats (e.g. sand dunes) are likely to be maintained. However, potential flood risk to freshwater/terrestrial habitats and species. Potential for a change in birds using the area, as a result of habitat change.	Flora and fauna in intertidal habitats (e.g. sand dunes) are likely to be maintained. However, potential flood risk to freshwater/terrestrial habitats and species. Potential for a change in birds using the area, as a result of habitat change.
	St Cyrus National Nature Reserve (NNR) and Local Nature Reserve (LNR)	• Important Flora and Fauna (including assemblages of breeding birds, moths, small blue butterfly and vascular plant assemblage) present in inland cliffs, sand dunes and grasslands. • Important for bird watching		Flora and fauna in intertidal habitats (e.g. sand dunes) are likely to be maintained. However, potential flood risk to freshwater/terrestrial habitats and species.	Flora and fauna in intertidal habitats (e.g. sand dunes) are likely to be maintained. However, potential flood risk to freshwater/terrestrial habitats and species. Potential for a change in birds using the area, as a result of habitat change.	Flora and fauna in intertidal habitats (e.g. sand dunes) are likely to be maintained. However, potential flood risk to freshwater/terrestrial habitats and species. Potential for a change in birds using the area, as a result of habitat change.
	St Cyrus Scottish Wildlife Trust Nature Reserve	• Landscape and conservation value	To avoid adverse impacts on, conserve and enhance the designated interest of locally conservation sites.	Integrity of local conservation interest features maintained.	Integrity of local conservation interest features maintained.	Integrity of local conservation interest features maintained.
Fisheries	Salmon / trout fishing	• Both the South and North Esk Rivers are very important salmon fishing rivers. • Situated at the mouth of the River North Esk are a number of fishing bothies and salmon netting stations. • Upstream of their outlets both rivers are popular with anglers.	To minimise the impact of policies on fishing activity	No adverse impacts in the short term	No adverse impacts in the medium term unless there are significant changes in water quality	No adverse impacts in the long term unless there are significant changes in water quality
Geology and Soils	Mixture of grade 2 and 3 agricultural land at Charleton and Kinnaber	• Low lying and low-grade • Used for rough pasture • Small plantations of coniferous and deciduous trees.	To minimise coastal flood and erosion risk to agricultural land	Potential flood risk to small sections of rough grazing land adjacent to the River North Esk channel.	Increased flood risk to small sections of rough grazing land adjacent to the River North Esk channel.	Increased frequency of flood risk to small sections of rough grazing land adjacent to the River North Esk channel.
Water	Beach	• Bay dune and spit complex covering 479 ha, extending 6km south from the River North Esk to	To maintain and enhance features as a natural flood defence	No adverse impacts as the beach and spit system is able to evolve naturally in the north.	No adverse impacts as the beach and spit system is able to evolve naturally in the north.	No adverse impacts as the beach and spit system is able to evolve naturally and eroded sediment will help to maintain the beach as a

CPU 1 Milton Ness to Montrose Harbour						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
		Montrose. • Consists of foredune, spit, sand-covered shingle, conifer plantations, acidic dune grassland, patches of heath and amenity grassland.		To the south, defences will remain and consequently the beach may narrow in front of defences, reducing its function as a natural defence line.	Following defence failure more sediment will be released into the beach system which may enhance the beach as a natural defence line.	natural defence line as sea levels rise.
	Dune system	• Dunes run most of the length of CPU 1. • St Cyrus and Kinnaber Links is one of the richest coastal habitats in the North East of Scotland. • The northern extent of Montrose Bay and Kinnaber Links supports a lichen rich dune heathland, foreshore and Saltmarsh	To maintain and enhance features as a natural flood defence	No adverse impacts as the dune system is able to evolve naturally in the north. To the south, defences will remain and prevent dunes acting as a form of defence.	No adverse impacts as the dune system is able to evolve naturally in the north. Following defence failure dunes will erode back relatively quickly to a more natural alignment. Over time the dune system will form a more natural defence.	No adverse impacts as the beach and spit system is able to evolve naturally.
	Waterbodies include (but are not limited to the following): • Couts Rock to Scurdie Ness Coastal Water Body (ID 200084) • River North Esk (Confluence with Cruick Water to Estuary) River Water Body (ID 5700) • Montrose bedrock and localised sand and gravel aquifers Ground Water Body (ID 150267)	All rivers, lakes, estuaries, coastal waters and groundwater within the study area must achieve a standard of 'good status' by 2015 under the terms of the EU Water Framework Directive (WFD); whereby 'status' is a measure of ecological, chemical, hydrological and morphological quality in surface waters.	To support the achievement of good ecological and chemical status/potential under the EU WFD	Natural processes of coastal waterbody will not be constrained. Potential for saline intrusion to affect groundwater and river waterbodies.	Natural processes of coastal waterbody will not be constrained. Potential for saline intrusion to affect groundwater and river waterbodies.	Natural processes of coastal waterbody will not be constrained. Potential for saline intrusion to affect groundwater and river waterbodies.
Landscape	• Contrast between St Cyrus beach, the high St Cyrus cliffs and the River North Esk • Dune systems • Montrose town, Golf Links and the Glaxo site	Local landscape characteristics contribute to the scenic attractiveness of the area. The Glaxo site is conspicuous in the southern part of this site.	To enhance the aesthetic and landscape quality of the coastline.	Allowing natural processes will maintain the landscape quality to the north.	Allowing natural processes will maintain the landscape quality to the north. Failing defences and rapid erosion following defence failure may negatively impact on the landscape.	Allowing natural processes will maintain the landscape quality to the north. Potentially negative impacts on landscape associated with defence failure in the south, however the frontage will start to evolve to a more natural landscape over time.

E1.3 CPU 2 Montrose Basin

Key Considerations

CPU 2 is dominated by the relatively undeveloped natural estuarine system known as Montrose Basin. Montrose Basin itself is characterised by mudflats, sands and channels. Montrose town, railway and road infrastructure dominate the eastern side of the Basin. Agricultural land, local infrastructure, a wildlife reserve and small communities are found around the remaining shores. Habitats within the Basin are highly designated for their environmental importance. A key consideration will be to maintain the Basin as a naturally functioning system while protecting the important assets at Montrose. Potential conflicts relate to anthropogenic pressures on the Basin and conserving important environmentally designated habitats.

Strategic flood and coastal risk management measures proposed by the SMP must not constrain the achievement of good ecological and chemical status/potential for all waterbodies in the SMP area. Opportunities to deliver mitigation identified in the River Basin Management Plan's Programme of Measures should be sought, where possible, during development of the SMP.

CPU 2 Montrose Basin						
SEA Receptor	Location/ feature	Key issues and benefits	Objectives that apply	No Active Intervention Scenario		
				Short Term (2012-2032)	Medium Term (2032-2082)	Long Term (2082-2112)
Population and Human Health	Residential development	• Town of Montrose has a population of 11,742 that has the potential to be affected by changes in SMP policy	To minimise coastal flooding and erosion risk and its impact on people, coastal land use and future development plans.	Defences remain providing flood protection to Montrose	As defences fail, potential flood risk to low lying areas in the south of Montrose and on Rossie Island	Increased flood risk to low lying areas in the south of Montrose and on Rossie Island
	Recreational activities	• The majority of small boating activity takes place on the west shore at the Montrose Sailing Club. • Net fishing still within the season and bait-digging amounting to about 4 tonnes per season. • Coastal walks throughout the basin • Birdwatching at the Scottish Wildlife visitor centre also attracts a range of visitors.	To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities	Minimal impact to recreational activities	As defences fail, potential flood risk to coastal walks and the wildlife visitor centre.	Increased flood risk to coastal walks and the wildlife visitor centre.
Material Assets and Infrastructure	(Montrose Port) Harbour Quay for national and international shipping imports / exports	• Montrose Port provides import and export services for various agricultural and oil related businesses located within the area. • Approximately 40% of the annual port traffic is oil related	To minimise coastal flooding and erosion risk and its impact on people, coastal land use and future development plans. To minimise the impact of policies on marine operations and activities	Defences remain providing flood protection to Montrose Port	As defences fail, potential flood risk to low lying areas in the south of Montrose and on Rossie Island	Increased flood risk to low lying areas in the south of Montrose and on Rossie Island
	Main East Coast Railway	• Main East Coast Railway situated adjacent to the foreshore, generally runs parallel to the coast in the SMP area	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	Defences remain providing flood protection to East Coast Railway	As defences fail, potential flood risk to the railway	Increased flood risk to the railway
	A92 & access to properties along Esk Road (A935)	• The A92 is a major transport corridor connecting the study area to other parts of the country. • Local roads provide access to settlements and some other locations along the coastline.	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	Defences remain providing flood protection to the A92 and A935.	As defences fail, potential flood risk to the A92 and A935.	Increased flood risk to theA92 and the A935.
	Sewage outfall, pumping station and	• Three outfalls all of which are	To minimise coastal flood and erosion risk to critical infrastructure and maintain	Assets will continue to be protected by defences in the short	Assets will be at increased flood risk as defences fail.	Increased frequency of flood risk to infrastructure assets.

CPU 2 Montrose Basin						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
	pipe line	combined storm outfalls	critical services	term.		
Historic Environment	Montrose Town Conservation Area (Outstanding)	• An area of special architectural and historic interest. Need to ensure that proposals do not affect the preservation or enhancement of the established character and appearance.	To minimise coastal flood and erosion risk to scheduled and other nationally, regionally or locally important archaeological and cultural heritage assets, sites and their setting.	Conservation Area will continue to be protected by defences in the short term.	Conservation Area will be at increased flood risk as defences fail.	Increased frequency of flood risk to the Conservation Area
	Dronners Dyke, cropmark sites at various locations around the basin, Roman camp at Dun, Bridge of Dun, including a number of locally important sites	• These sites are a mixture of physical features and crop mark sites. • Features to the south of the Basin are particularly vulnerable to erosion and flooding.	To minimise coastal flood and erosion risk to scheduled and other nationally, regionally or locally important archaeological and cultural heritage assets, sites and their setting.	No adverse effects as assets are located on higher land.	No adverse effects as assets are located on higher land.	No adverse effects as assets are located on higher land.
Flora, Fauna and Biodiversity	Montrose Basin Ramsar site and SPA	• Supports over 20,000 waterfowl including many internationally important species, and aggregations of non-breeding birds.	To support natural coastal processes and maintain and enhance the integrity of internationally designated nature conservation sites and the favourable condition of their interest features	Natural coastal processes will not be constrained. Integrity of international conservation interest features maintained.	Natural coastal processes will not be constrained. Integrity of international conservation interest features maintained.	Natural coastal processes will not be constrained. Integrity of international conservation interest features maintained.
	Montrose Basin SSSI	• Designated for inter-tidal mudflats saltmarsh, marsh, saline lagoons, vascular plants, breeding wildfowl and wintering waders, stratigraphy	To maintain and enhance nationally designated conservation sites and their interest features	Integrity of national conservation interest features maintained.	With climate change, increased frequency of saltmarsh being inundated due to rising sea levels and storm surges, however, failure of defences would allow the creation of new intertidal areas and as long as vertical accretion keeps pace with sea level rise, the saltmarsh will translate landward.	With climate change, increased frequency of saltmarsh being inundated due to rising sea levels and storm surges, however, failure of defences would allow the creation of new intertidal areas and as long as vertical accretion keeps pace with sea level rise, the saltmarsh will translate landward.
	Montrose Basin LNR	• Designated for reed swamps, plant communities, wildfowl and waders and invertebrates	To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites	Integrity of local conservation interest features maintained.	Integrity of local conservation interest features maintained.	Integrity of local conservation interest features maintained.
	Scottish Wildlife Trust Nature Reserve	• Designated for nature conservation value • Wildfowling is the only recreational use of the reserve, which is managed with approximately 250 people per season receiving permits to shoot.	To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites	Integrity of local conservation interest features maintained. Wildfowling is unlikely to be affected.	Integrity of local conservation interest features maintained. Wildfowling is unlikely to be affected.	Integrity of local conservation interest features maintained. Wildfowling is unlikely to be affected.
	Geological Conservation Review (GCR)	• The unit provides one of the best exposures in Eastern Scotland of the deposits (a sandy layer) of the main post-glacial transgression and the only exposure of the deposits from a	To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites	Natural coastal processes are key to maintaining the integrity of the geological site through the exposure of geological features.	Natural coastal processes are key to maintaining the integrity of the geological site through the exposure of geological features.	Natural coastal processes are key to maintaining the integrity of the geological site through the exposure of geological features. There may be potential however, for increased erosion of exposures with sea level

CPU 2 Montrose Basin						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
		tsunami, which hit the eastern and northern coasts of Scotland approximately 7000 years ago. • Coastal defences may have a potentially detrimental effect by altering the balance of these processes, both within the immediate vicinity of the defence and further afield. Balancing collecting pressure, public access and scientific study is another challenge for management.				rise and increased storminess.
	Regionally Important Geological / Geomorphologic Site (RIGS)		To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites	Natural coastal processes are key to maintaining the integrity of the geological site through the exposure of geological features.	Natural coastal processes are key to maintaining the integrity of the geological site through the exposure of geological features.	Natural coastal processes are key to maintaining the integrity of the geological site through the exposure of geological features.
Fisheries	Salmon and Sea Trout fishery, sailing, angling, bait-digging	• The Basin has traditionally been important for salmon and sea trout fishing, both having been fished commercially since 1836 but in recent years the numbers caught have declined.	To minimise the impact of policies on fishing activity	No adverse impacts in the short term	No adverse impacts in the medium term	No adverse impacts in the long term
Geology and soils	Mainly grade 3 agricultural land, with small areas of grade 2	• The agricultural land around the basin is low lying with the majority being grade 3 used mainly for grazing, with a number of grade 2 stretches located in the south east corner of the basin utilised for arable farming. • Due to the low-lying nature of the area, fields close to the shore have a tendency to flood during wet periods.	To minimise coastal flood and erosion risk to agricultural land	Potential flood risk to agricultural land to the west of the Basin.	Increased flood risk to agricultural land to the west of the Basin.	Increased frequency of flood risk to agricultural land to the west of the Basin.
Water	Water bodies include (but are not limited to the following): • Couts Rock to Scurdie Ness Coastal Water Body (ID 200084) • Montrose Basin Transitional Water Body (ID 200079) Montrose bedrock and localised sand and gravel aquifers Ground Water Body (ID 150267)	All rivers, lakes, estuaries, coastal waters and groundwater within the study area must achieve a standard of 'good status' by 2015 under the terms of the EU Water Framework Directive (WFD); whereby 'status' is a measure of ecological, chemical, hydrological and morphological quality in surface waters.	To support the achievement of good ecological and chemical status/potential under the EU WFD	Natural processes of coastal and transitional water bodies will not be constrained. Potential for limited saline intrusion to groundwater and surface water bodies.	Natural processes of coastal and transitional water bodies will not be constrained. Potential for limited saline intrusion to groundwater and surface water bodies.	Natural processes of coastal and transitional water bodies will not be constrained. Potential for limited saline intrusion to groundwater and surface water bodies.
Landscape	• Relatively undeveloped natural estuarine ecosystem	• Mudflats dominate the landscape within Montrose Basin.	To enhance the aesthetic and landscape quality of the coastline	Allowing natural processes will maintain the landscape quality of the Basin.	Allowing natural processes will maintain the landscape quality of the Basin.	Allowing natural processes will maintain the landscape quality of the Basin.

CPU 2 Montrose Basin						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
	• Mudflats, sands, mussel beds, channels and areas of algae create a varied landscape • Montrose town with its tall spire, the Harbour and the main East Coast Railway bind the Basin along its eastern side. • The north shore of the Basin is agricultural land, mostly used for arable farming.			Failing defences and slow erosion following defence failure may impact on the landscape of the Basin.	Failure of defences at Montrose and Ferryden may have an adverse impact in the landscape in these areas.	Failure of defences at Montrose and Ferryden may have an adverse impact in the landscape in these areas.

E1.4 CPU 3 Scurdie Ness to Rickle Craig

Key Considerations

The environmentally designated volcanic coastal cliffs dominate this coastal frontage. The cliffed headland is fronted by isolated shingle / sand beaches and fringed by an intertidal rock platform. The designated Boddin Lime Kiln remains are located to the south of the frontage. The headland is of geological value and therefore a key consideration will be the conservation of this asset. A potential conflict relates to conservation of the heritage features at Boddin Point and maintaining a naturally evolving system to maintain environmental designations.

Strategic flood and coastal risk management measures proposed by the SMP must not constrain the achievement of good ecological and chemical status/potential for all waterbodies in the SMP area. Opportunities to deliver mitigation identified in the River Basin Management Plan's Programme of Measures should be sought, where possible, during development of the SMP.

CPU 3 Scurdie Ness to Rickle Craig						
SEA Receptor	Location/ feature	Key issues and benefits	Objective that apply	No Active Intervention Scenario		
				Short Term (2012-2032)	Medium Term (2032-2082)	Long Term (2082-2112)
Population and Human Health	Recreational activities	• Precious gem collecting • Birdwatching • Sea angling	To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management	No adverse impacts	No adverse impacts	No adverse impacts
Material Assets and Infrastructure	East coast Rail line	• Situated adjacent to the foreshore.	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	Minimal erosion risk to the railway, but potential risk of cliff falls.	Minimal erosion risk to the railway, but potential risk of cliff falls.	Minimal erosion risk to the railway, but potential risk of cliff falls.
	Minor farm access roads	• Local roads provide access to settlements and some other locations along the coastline.	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	Minimal erosion risk to farm access routes, but potential risk of cliff falls.	Minimal erosion risk to farm access routes, but potential risk of cliff falls.	Minimal erosion risk to farm access routes, but potential risk of cliff falls.
	Small harbours	• Usan (small and natural) harbour	To minimise the impact of policies on marine operations and activities	No adverse impacts on small harbour activities.	No adverse impacts on small harbour activities.	No adverse impacts on small harbour activities.
Historic Environment	Scurdie Ness West beacon, Montrose Leading Lights, Scurdie Ness Lighthouse	• B listed structure.	To minimise coastal flood and erosion risk to scheduled and other nationally, regionally or locally important archaeological and cultural heritage assets, sites and their setting.	Minimal erosion predicted, therefore minimal impacts on these structures.	Minimal erosion predicted, therefore minimal impacts on these structures.	Minimal erosion predicted, however, there may be potential impact on these structures from cliff falls.
	Boddin Point Lime Kilns	• Grade B listed building and Site of Local Importance	To minimise coastal flood and erosion risk to scheduled and other nationally, regionally or locally important archaeological and cultural heritage assets, sites and their setting.	Continued erosion risk to Lime Kilns, loss of parts of historic asset.	Increased erosion risk to Lime Kilns and loss of parts of historic asset.	Potential loss of lime kilns.
	Fishtown of Usan, Old Ice house and lookout Tower	• Grade C listed harbour and Sites of Local Importance		No adverse impacts.	No adverse impacts.	No adverse impacts.
	Usan Village, Salt House, Chapel of St Skate and usan Harbour	• Grade B/C listed buildings and Sites of Local Importance		No adverse impacts.	No adverse impacts.	No adverse impacts.

CPU 3 Scurdie Ness to Rickle Craig						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objective that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
Flora, fauna and biodiversity	Rickle Craig to Scurdie Ness SSSI	• Saltmarsh, coastal grassland, snails, geology	To avoid adverse impacts on, conserve and enhance the designated interest of locally conservation sites.	Integrity of local conservation interest features maintained.	Integrity of local conservation interest features maintained.	Integrity of local conservation interest features maintained.
	Scurdie Ness GCR sites Usan Harbour GCR site The area around Scurdie Ness	• Provides the best section through Old Red Sandstone lavas and associated sedimentary rocks of the Montrose Volcanic Formation in Scotland. • Area around Scurdie Ness is a GCR site in its own right for its mineralogy – due to the presence of these agates (some of which are gem quality) within the lavas.	To avoid adverse impacts on, conserve and enhance the designated interest of locally conservation sites.	Integrity of local conservation interest features maintained.	Integrity of local conservation interest features maintained.	Integrity of local conservation interest features maintained.
Geology and Soils	Mainly grade 3 agricultural land with grade 2 situated inland	• Agriculture is the predominant land use within the unit. • The agricultural land situated between Scurdie Ness and Boddin Point is of good agricultural quality with the majority being grade 3, and a small area of grade 2 located around the Usan area. • The area is sparsely populated containing a number of farmhouses, cottages and the small settlement of Usan.	To minimise coastal flood and erosion risk to agricultural land	Minimal loss of agricultural land to erosion.	Minimal loss of agricultural land to erosion.	Minimal loss of agricultural land to erosion.
Water	Water bodies include (but are not limited to the following): • Scurdie Ness to Deil s Head Coastal Water Body (ID 200078) Montrose bedrock and localised sand and gravel aquifers Ground Water Body (ID 150267)	All rivers, lakes, estuaries, coastal waters and groundwater within the study area must achieve a standard of 'good status' by 2015 under the terms of the EU Water Framework Directive (WFD); whereby 'status' is a measure of ecological, chemical, hydrological and morphological quality in surface waters.	To support the achievement of good ecological and chemical status/potential under the EU WFD	Natural processes of coastal water body will not be constrained. No anticipated impact on groundwater and surface water bodies.	Natural processes of coastal water body will not be constrained. No anticipated impact on groundwater and surface water bodies.	Natural processes of coastal water body will not be constrained. No anticipated impact on groundwater and surface water bodies.
Landscape	• Cliffed headland and rock platform • Isolated shingle / sand beaches • Small old fishing village of Usan	• Scurdie Ness to Boddin Point is one of two significant lengths of rocky shore within the SMP area. • Predominantly wave-cut rock platform and cliffs with a beach at Fishtown of Usan.	To enhance the aesthetic and landscape quality of the coastline	Allowing natural processes to continue will maintain the landscape quality.	Allowing natural processes to continue will maintain the landscape quality.	Allowing natural processes to continue will maintain the landscape quality overall. However, as sea levels rise the rock platform may become submerged and pocket beaches may narrow.

CPU 3 Scurdie Ness to Rickle Craig						
SEA Receptor	Location/ feature	Key issues and benefits	Objective that apply	No Active Intervention Scenario		
				Short Term (2012-2032)	Medium Term (2032-2082)	Long Term (2082-2112)
		• Usan, 5km south of Montrose, is a small beach area (70m x 20m wide) of coarse sand and shingle				

E1.5 Issues and Objectives – CPU 4 Rickle Craig to Lang Craig

Key Considerations

CPU 4 is characterised by a wide sweeping bay, flanked at either end by cliffed headlands. Lunan Bay, consists of extensive natural dune systems and a wide sandy beach, intersected by the Lunan Water outlet. A community of holiday homes at Corbie Knowe is nestled at the southern end of the bay which is one of the most popular recreational bathing beaches in the Angus area. A key driver along this section of coast will be to continue to let the bay evolve naturally while maintaining the recreational and tourism potential of the area. Potential conflicts therefore arise between the natural system and recreational pressures.

Strategic flood and coastal risk management measures proposed by the SMP must not constrain the achievement of good ecological and chemical status/potential for all waterbodies in the SMP area. Opportunities to deliver mitigation identified in the River Basin Management Plan's Programme of Measures should be sought, where possible, during development of the SMP.

CPU 4 Rickle Criag to Land Craig						
SEA Receptor	Location/ feature	Key issues and benefits	Objectives that apply	No Active Intervention Scenario		
				Short Term (2012-2032)	Medium Term (2032-2082)	Long Term (2082-2112)
Population and Human Health	Some residential property and B&B behind dunes at lunan	• Several farm houses and cottages located along the unit	To minimise coastal flooding and erosion risk and its impact on people, coastal land use and future development plans	Properties set back from flood risk area, no adverse impacts.	Properties set back from flood risk area, no adverse impacts	Properties set back from flood risk area, no adverse impacts
	Holiday cottages / chalets at Corbie Knowe	• Small community of holiday homes located in the southern corner at both Corbie Knowe and Ethie Haven	To minimise coastal flooding and erosion risk and its impact on people, coastal land use and future development plans	Erosion risk to holiday homes as defences fail.	Increased risk and potential loss of some holiday homes.	Loss of holiday homes to erosion.
	Recreational activities	• Lunan Bay is one of the most popular recreational bathing waters within the Angus area, offering a sheltered bay location with fine sand and shallow waters. Due to its popularity, human erosion of the dunes continues to be a serious problem. An attempt to address this problem has been through the construction of formal access to the beach by boardwalks running from the car park to various locations on the beach. • Other activities include horse riding on the beach and water sports (Windsurfing, surfing, sand sailing, sea kayaking.	To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management	The Bay and dunes are likely to remain stable, minimal impact on recreational activities.	The Bay and dunes are likely to remain stable, minimal impact on recreational activities.	The Bay and dunes are likely to remain stable, minimal impact on recreational activities. However, if dunes erode and deteriorate due to human activities and wave erosion, there may be an impact on recreational activities.
	Designated bathing beach	• North Lunan Bay beach	To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management	Natural processes will continue, therefore no adverse impacts.	Natural processes will continue, therefore no adverse impacts.	Natural processes will continue, therefore no adverse impacts.
Material Assets and Infrastructure	Minor access road and car park at Lunan	• Local roads provide access to settlements and some other locations along the coastline	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	No adverse impacts.	No adverse impacts.	No adverse impacts.

CPU 4 Rickle Craig to Land Craig						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
Historic Environment	Black jack, Red Castle, Newbarns and Corbie Knowe	• Scheduled monuments e.g. Corbie Knowe - a small artificial mound perched high above the beach • A-listed building e.g. Redcastle - founded by William the Lion as a hunting seat in the 12th Century. • Sites of local importance e.g. World War II anti-tank blocks at Lunan Water, which are very vulnerable to erosion	To minimise coastal flood and erosion risk to scheduled and other nationally, regionally or locally important archaeological and cultural heritage assets, sites and their settings	Heritage properties on higher ground, no adverse impacts. Continued erosion of anti-tank blocks at Lunan Water.	Heritage properties on higher ground, no adverse impacts. Continued erosion / loss of anti-tank blocks at Lunan Water.	Heritage properties on higher ground, no adverse impacts. Continued erosion / loss of anti-tank blocks at Lunan Water.
Flora, fauna and biodiversity	Northern 1km of Whiting Ness to Ethie Haven SSSI covering the intertidal rock platform at Ethie Haven to the mouth of Keilor Burn	• Coastal grassland, cliffs (rock-ledge plant communities), Bryophyte, Invertebrates and breeding birds (the largest breeding seabird colony in Tayside) • Various invertebrates including Lepidoptera. • Old Red Sandstone igneous Non-marine Devonian stratigraphy	To maintain and enhance nationally designated conservation sites and their interest features	Integrity of conservation interest features maintained.	Integrity of conservation interest features maintained.	Integrity of conservation interest features maintained.
Fisheries	Fishing	• The bay is very popular for salmon fishing with netting stations placed to the north and south of the Lunan Water	To minimise the impact of policies on fishing activity	No adverse impacts	No adverse impacts	No adverse impacts
Geology and Soils	Mainly grade 3 agricultural land	• Agriculture is of good quality and the predominant land use within the unit of Lunan Bay • Approximately a 25-75% split between grade 2 and 3 land. • Majority of the grade 3 located adjacent to the coast • Grade 2 land situated landward and at the northern and southern extremes of the bay	To minimise coastal flood and erosion risk to agricultural land	The beach / dune system will continue to provide a natural form of defence to the backing agricultural land.	The beach / dune system will continue to provide a natural form of defence to the backing agricultural land.	The beach / dune system should continue to provide a natural form of defence to the backing agricultural land, however, increased erosion risk to agricultural land if dunes erode.
Water	Water bodies include (but are not limited to the following): • Scurdie Ness to Deil s Head Coastal Water Body (ID 200078) • Montrose bedrock and localised sand and gravel aquifers Ground	All rivers, lakes, estuaries, coastal waters and groundwater within the study area must achieve a standard of 'good status' by 2015 under the terms of the EU Water Framework Directive (WFD); whereby 'status' is a measure of ecological, chemical, hydrological and morphological quality in surface waters.	To support the achievement of good ecological and chemical status/potential under the EU WFD	Natural processes of coastal water body will not be constrained. No anticipated impact on groundwater and surface water bodies.	Natural processes of coastal water body will not be constrained. No anticipated impact on groundwater and surface water bodies.	Natural processes of coastal water body will not be constrained. No anticipated impact on groundwater and surface water bodies.

CPU 4 Rickle Criag to Land Craig						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
	Water Body (ID 150267) Arbroath bedrock and localised sand and gravel aquifers Ground Water Body (ID 150265)					
	Beach & dune system	• The wide intertidal sand beach at Lunan Bay gently slopes into the sea and is backed by a dune ridge and raised beach (8m OD), up to 300m wide in parts. • The dune ridge is at its highest (12m) and widest (100m) in the northern part of the bay • Approximately 250m from High Water Mark, fossil cliffs are present at the landward edge of a raised beach. • The raised beach widens to about 300m and curves to within 50m of the HWM approximately 1.5km south of Lunan water	To maintain and enhance features as a natural flood defence	Continuation of natural processes, a return to a more natural system at Corbie Knowe once defences fail, enhancing the beach and dune system as a natural defence.	Continuation of natural processes, beach and dune system will continue as a natural defence.	Continuation of natural processes, beach and dune system will continue as a natural defence.
Landscape	• A wide sweeping bay flanked at either end by cliff headlands. • The wide intertidal sand beach gently slopes into the sea and is backed by a dune ridge and raised beach. • The Lunan Water breaks the dune system midway along the bay. • Holiday homes at Corbie Knowe.	The wide intertidal beach of Lunan Bay is an important landscape feature in this CPU.	To enhance the aesthetic and landscape quality of the coastline.	Allowing natural processes will maintain the landscape quality.	Allowing natural processes will maintain the landscape quality.	Allowing natural processes will maintain the landscape quality.

E1.6 CPU 5 Lang Craig to Whiting Ness

Key Considerations

The environmentally designated Old Red Sandstone coastal cliffs dominate this coastal frontage. The predominantly undeveloped natural shoreline is characterised by sea stacks, blow holes, caves and arches, contributing to an outstanding and unique landscape. The cliffs are of geological value and therefore a key consideration will be the conservation of these assets. The village of Auchmithie and its derelict harbour are designated as a conservation area for heritage importance. A coastal path extends along the Seaton cliffs and therefore potential conflict exists between tourism / recreation pressures and the designated habitats.

Strategic flood and coastal risk management measures proposed by the SMP must not constrain the achievement of good ecological and chemical status/potential for all waterbodies in the SMP area. Opportunities to deliver mitigation identified in the River Basin Management Plan's Programme of Measures should be sought, where possible, during development of the SMP.

CPU 5 Land Craig to Whiting Ness						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
Population and Human Health	Small residential development at Ethie Haven and Auchmithie	• Further farm and private dwellings located along the unit.	To minimise coastal flooding and erosion risk and its impact on people, coastal land use and future development plans	No adverse impacts.	No adverse impacts.	No adverse impacts.
	Recreational activities	• The cliff area attracts many visitors, both locals and tourists. The cliff walk is widely used because it is located close to Arbroath and it offers access to the coast, with views, archaeological interests, bird watching etc. • Birdwatching from beach of cliffs • Sea angling from cliffs	To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management	Potential erosion risk to cliff top paths as a result of periodic cliff falls.	Potential erosion risk to cliff top paths as a result of periodic cliff falls.	Potential erosion risk to cliff top paths as a result of periodic cliff falls.
	Recreational beach at Auchmithie	• Shingle beach at Auchmithie		No adverse impacts	No adverse impacts	Potential for narrowing of the beach as sea levels rise.
Material Assets and Infrastructure	Minor access roads	• Local roads provide access to settlements and some other locations along the coastline.	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	No adverse impacts to most as located away from the cliff edge. Potential erosion risk to access roads to Auchmithie and Ethie Haven, in the form of cliff falls.	No adverse impacts to most as located away from the cliff edge. Potential erosion risk to access roads to Auchmithie and Ethie Haven, in the form of cliff falls.	No adverse impacts to most as located away from the cliff edge. Potential erosion risk to access roads to Auchmithie and Ethie Haven, in the form of cliff falls.
	Septic tank outfall (Auchmithie)	TBC	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	TBC		
Historic Environment	Auchmithie Conservation Area	• An area of special historic or architectural interest that it is desirable to preserve	To minimise coastal flood and erosion risk to scheduled and other nationally, regionally or locally important archaeological and cultural heritage assets, sites and their setting.	No adverse impacts on the Conservation Area	No adverse impacts on the Conservation Area	No adverse impacts on the Conservation Area

CPU 5 Land Craig to Whiting Ness						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
	St Murdoch's Chapel, Ethie, Red Head, Prail Castle, West Mains of Ethie, Lud Castle, Maiden Castle, Forbidden Cave, Deils Heid, Needles E'e, Gaylet Pot	• CPU5 contains seven sites that have been recognised to be of national importance and scheduled accordingly as SMs Scheduled Monuments • B-Listed building : St Murdochs Chapel	To minimise coastal flood and erosion risk to scheduled and other nationally, regionally or locally important archaeological and cultural heritage assets, sites and their settings	Potential erosion risk to those historic assets near the cliff edge, in the form of cliff falls.	Potential erosion risk to those historic assets near the cliff edge, in the form of cliff falls.	Potential erosion risk to those historic assets near the cliff edge, in the form of cliff falls.
Flora, Fauna and Biodiversity	Whiting Ness to Ethie Haven SSSI	• Coastal grassland, cliffs (rock-ledge plant communities), Bryophyte, Invertebrates and breeding birds (the largest breeding seabird colony in Tayside) • Various invertebrates including Lepidoptera. • Old Red Sandstone igneous Non-marine Devonian stratigraphy	To maintain and enhance nationally designated conservation sites and their interest features	Integrity of national conservation interest features maintained.	Integrity of national conservation interest features maintained.	Integrity of national conservation interest features maintained.
	GCR Sites • Whiting Ness GCR • Black Rock to East Comb GCR	• Important for studying stratigraphy and the palaeogeographic evolution and volcanic environments of the Midland Valley • The Black Rock to EastComb GCR site has important research potential for studies on Lower Devonian volcanic environments	To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites	Integrity of local conservation interest features maintained.	Integrity of local conservation interest features maintained.	Integrity of local conservation interest features maintained.
	RIGS	• The area from Whiting Ness to Carlingheugh Bay, which has excellent educational potential	To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites	Integrity of local conservation interest features maintained.	Integrity of local conservation interest features maintained.	Integrity of local conservation interest features maintained.
	Seaton Cliffs SWT Nature Reserve	• Geodiversity value	To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites	Integrity of local conservation interest features maintained.	Integrity of local conservation interest features maintained.	Integrity of local conservation interest features maintained.
Soils and Geology	Mainly grade 3 agricultural land with small pockets of grade 2 land	• Predominant land use between Lang Craig and Whiting Ness is agricultural • The agricultural land within the unit is of good quality, with approximately a 25-75% split between grade 2 and 3 land • The majority of the grade 3 is located adjacent to the coast in the central section of the unit. • The grade 2 land, like Lunan Bay is situated at the northern and	To minimise coastal flood and erosion risk to agricultural land	Minimal loss of agricultural land to erosion.	Minimal loss of agricultural land to erosion.	Minimal loss of agricultural land to erosion.

CPU 5 Land Craig to Whiting Ness						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
		southern ends of the unit (Lang Craig and Whiting Ness				
Water	Water bodies include (but are not limited to the following): • Scurdie Ness to Deil s Head Coastal Water Body (ID 200078) • The Deil s Head to Carnoustie Coastal Water Body (ID 200078) • Arbroath bedrock and localised sand and gravel aquifers Ground Water Body (ID 150265)	All rivers, lakes, estuaries, coastal waters and groundwater within the study area must achieve a standard of 'good status' by 2015 under the terms of the EU Water Framework Directive (WFD); whereby 'status' is a measure of ecological, chemical, hydrological and morphological quality in surface waters.	To support the achievement of good ecological and chemical status/potential under the EU WFD	Natural processes of coastal water bodies will not be constrained. No anticipated impact on groundwater and surface water bodies.	Natural processes of coastal water bodies will not be constrained. No anticipated impact on groundwater and surface water bodies.	Natural processes of coastal water bodies will not be constrained. No anticipated impact on groundwater and surface water bodies.
Landscape	• Old Red Sandstone cliffs and rocky shore • Sea stacks, blowholes, caves, wave cut platforms and arches, all contribute to the outstanding and unique landscape • Auchmithie village and derelict Harbour	The stretch of sea cliffs and rocky shore is an important landscape feature in this CPU.	To enhance the aesthetic and landscape quality of the coastline.	Allowing natural processes to continue will maintain the landscape quality.	Allowing natural processes to continue will maintain the landscape quality.	Allowing natural processes to continue will maintain the landscape quality.

E1.7 CPU 6 Whiting Ness to West Haven

Key Considerations

This section of coast is characterised by the town of Arbroath to the north and a more natural open coastline, with dunes, sand / shingle beaches and a rock platform to the south of the frontage. Environmental designations relate to the natural areas to the south, however there is potential conflict here relating to conserving these habitats while maintaining and protecting sewage, water and rail infrastructure located on / near to the shore. A key driver along the north of the frontage will be the continued protection of Arbroath town and harbour and it's associated residential, commercial, recreation and heritage assets into the future.

Strategic flood and coastal risk management measures proposed by the SMP must not constrain the achievement of good ecological and chemical status/potential for all waterbodies in the SMP area. Opportunities to deliver mitigation identified in the River Basin Management Plan's Programme of Measures should be sought, where possible, during development of the SMP.

CPU 6 Whiting Ness to West Haven						
SEA Receptor	Location/ feature	Key issues and benefits	Objectives that apply	No Active Intervention Scenario		
				Short Term (2012-2032)	Medium Term (2032-2082)	Long Term (2082-2112)
Population and Human Health	Residential settlements	• The residential areas include the large town of Arbroath in the north of the unit and the small coastal settlement of East Haven located to the south. There are also a few sparsely populated farm dwellings. • Arbroath is the largest town within Angus and supports a large proportion of the residential, recreational and commercial interests within the unit and along the Angus Coast.	To minimise coastal flooding and erosion risk and its impact on people, coastal land use and future development plans	Defences remain, risk of overtopping in the vicinity of the inner harbour and at Seagate, therefore potential flood risk to some residential properties in these areas.	Harbour defences remain, risk of overtopping in the vicinity of the inner harbour and at Seagate, therefore potential flood risk to some residential properties in these areas.	Harbour defences remain in some form, increased risk of overtopping / flooding in the vicinity of the inner harbour and at Seagate.
	Small industry, harbour facilities	• Arbroath was once the largest fishing harbour for the town although the fishing fleet has declined over recent years. There are still a small number of fishing vessels registered to the harbour, who land their catch at ports further north. • Arbroath Harbour operates a commercial slipway utilised by a wide range of vessels for refitting etc	To minimise the impact of policies on marine operations and activities	Defences remain, risk of overtopping in the vicinity of the harbour, therefore potential flood risk to some commercial assets in these areas.	Harbour defences remain, risk of overtopping in the vicinity of the harbour, therefore potential flood risk to some commercial assets in these areas.	Harbour defences remain in some form, increased risk of overtopping in the vicinity of the harbour, therefore potential flood risk to some commercial assets in these areas.
	Designated bathing waters and beach	• "Excellent" rated EC Designated Bathing Water results at Arbroath West Links. • Recreational beach at West Links	To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management	Continued lowering of the beach in front of defences.	Erosion of raised beach following the failure of defences at West Links will release stored sediment to the beach. Access to the beach may however, be compromised.	Potentially no safe access to West Links Beach due to failure of defences and erosion of the raised beach.

CPU 6 Whiting Ness to West Haven						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
	Recreational assets	• Victoria Park (East Links) public park and football pitch • Pleasure boats, water sports and sea angling • Arbroath FC football ground • Coastal Walk (Arbroath – West Haven) • New promenade with access to recreation beach at the west links area of Arbroath • Arbroath Golf courses (Elliot)	To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management	Defences will provide protection to recreational assets in the short term, however there is potential for increased frequency of overtopping in the short term. No risk to Arbroath Golf Course.	Following defence failure, loss of parts of Victoria Park, the promenade and risk to the football ground through erosion. No risk to Arbroath Golf Course. Coastal paths may need to be relocated further inland.	Ongoing loss of parts of Victoria Park and increased risk of erosion of the football ground. No risk to Arbroath Golf Course. Coastal paths may need to be relocated further inland.
Material Assets and Infrastructure	Access to Arbroath Harbour	• The majority of the traffic in the harbour is made up of vessels operating angling/day trips and private recreational vessels • The harbour has increasingly become popular with visiting yachts.	To minimise the impact of policies on marine operations and activities	Defences remain, risk of overtopping in the vicinity of the harbour, therefore potential flood risk to the access road.	Harbour defences remain, risk of overtopping in the vicinity of the harbour, therefore potential flood risk to the access road.	Harbour defences remain in some form, increased risk of overtopping in the vicinity of the harbour, therefore potential flood risk to the access road.
	Sewage outfall (CSO)	• Victoria Park, Arbroath • Queens Drive, Arbroath • West Links, Arbroath	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	Defences remain, providing protection to outfalls and associated services.	Following defence failure, assets will be at increased risk of flooding / erosion.	Increased frequency of flood / erosion risk to assets.
	A92 & minor access roads	• The A92 is a major transport corridor connecting the study area to other parts of the country. • Local roads provide access to settlements and some other locations along the coastline.	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	No adverse impacts.	Risk of localised flooding at Elliot Roundabout.	Risk of localised flooding at Elliot Roundabout and to the A92 near to the harbour.
	Main East Coast Railway	• Runs roughly parallel to coastline along CPU to the south of Arbroath.	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	Potential for localised flooding of railway line near Elliot. Potential disruption to services.	Increased extent of railway at risk of flooding. Potential disruption to services.	Extent of railway at risk of flooding near Elliot increases. Potential disruption to services.
	Sewage pumping station, long sea outfall and pipe line	• Dowrie	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	Defences remain, no impacts	Defences remain, no impacts	Erosion risk to outfall following defence failure.
Historic Environment	St Ninians Well, Arbroath Harbour, Old Arbroath Harbour, Signal Tower Museum	• SM: Site of Hospital of St John the Baptist • Two B-Listed buildings • Discovery of a Bronze Age cist at the cliffs of Whiting Ness • Area is particularly important as it	To minimise coastal flood and erosion risk to scheduled and other nationally, regionally or locally important archaeological and cultural heritage assets, sites and their settings.	Defences remain, risk of overtopping in the vicinity of the harbour, therefore potential flood risk to historic assets in this area.	Harbour defences remain, risk of overtopping in the vicinity of the harbour, therefore potential flood risk to historic assets in this area.	Harbour defences remain in some form, increased risk of overtopping in the vicinity of the harbour, therefore potential flood risk to historic assets in this area.

CPU 6 Whiting Ness to West Haven						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
		contains many burial grounds				
	Arbroath Town Conservation Area	• An area of special architectural and historic interest. Need to ensure that proposals do not affect the preservation or enhancement of the established character and appearance.	To minimise coastal flood and erosion risk to scheduled and other nationally, regionally or locally important archaeological and cultural heritage assets, sites and their setting.	Defences remain, risk of overtopping in the vicinity of the harbour, therefore potential flood risk to the Conservation Area.	Harbour defences remain, risk of overtopping in the vicinity of the harbour, therefore potential flood risk to the Conservation Area.	Harbour defences remain in some form, increased risk of overtopping in the vicinity of the harbour, therefore potential flood risk to the Conservation Area.
	Oldest recorded fishing village in Scotland	• Old Harbour was built at Arbroath in 1394 to the east of the present harbour and in front of the Old Shorehead. • The existing Arbroath harbour was built in 1840; a tidal harbour, which is still in use today.	To minimise coastal flood and erosion risk to scheduled and other nationally, regionally or locally important archaeological and cultural heritage assets, sites and their setting. To minimise the impact of policies on marine operations and activities.	Defences remain, risk of overtopping in the vicinity of the harbour, therefore potential flood risk to the Old Harbour.	Harbour defences remain, risk of overtopping in the vicinity of the harbour, therefore potential flood risk to the Old Harbour.	Harbour defences remain in some form, increased risk of overtopping in the vicinity of the harbour, therefore potential flood risk to the Old Harbour.
Flora, fauna and biodiversity	Elliot Links SSSI	• Stable sand dune system • Abandoned river meanders, which support important open dune and fen plant communities and invertebrates.	To maintain and enhance nationally designated conservation sites and their interest features	Integrity of national conservation interest features maintained. Potential flood risk to freshwater habitats and species not currently flooded.	Integrity of national conservation interest features maintained. Increased flood risk to freshwater habitats and species not currently flooded.	Integrity of national conservation interest features maintained. Increased flood risk to freshwater habitats and species not currently flooded.
	East Haven SSSI	• Greater Yellow Rattle • Sand dune habitats	To maintain and enhance nationally designated conservation sites and their interest features	Integrity of national conservation interest features maintained.	Integrity of national conservation interest features maintained.	Integrity of national conservation interest features maintained.
Fisheries	Commercial Fishing and Sea angling	• Small number of fishing vessels registered to the harbour, landing their catch at ports further north. • The only commercial fishing taking place is for shellfish such as prawns, crab, and lobster	To minimise the impact of policies on fishing activity	Defences remain, risk of overtopping in the vicinity of the harbour, therefore potential flood risk to the access road and knock on effects to commercial fishing.	Harbour defences remain, risk of overtopping in the vicinity of the harbour, therefore potential flood risk to the access road and knock on effects to commercial fishing.	Harbour defences remain in some form, increased risk of overtopping in the vicinity of the harbour, therefore potential flood risk to the access road and knock on effects to commercial fishing.
Soils and Geology	Agricultural land	• The agricultural land within the unit is of a major contrast. • The land located adjacent to the shore is low-lying Class 4 land, mainly used for rough grazing purposes. • The land situated directly behind on the raised beach is Class 1 supporting a high yield of varying crops.	To minimise coastal flood and erosion risk to agricultural land.	The rock platform and beach will continue to provide protection to the Class 1 agricultural land on the raised beach. Localised areas of flooding of Class 4 land directly behind the shore.	The rock platform and beach will continue to provide protection to the Class 1 agricultural land on the raised beach. Localised areas of flooding of Class 4 land directly behind the shore.	The rock platform and beach will continue to provide protection to the Class 1 agricultural land on the raised beach. Localised areas of flooding of Class 4 land directly behind the shore.
Water	Shingle / sand beaches	• An extensive marine abrasion platform backed by several storm beaches consisting of boulders and shingle runs along almost the entire	To maintain and enhance features as a natural flood defence	Where defences remain, beaches may narrow in front of defences, reducing their function of a natural defence.	Erosion of raised beaches and frontal dune erosion will help maintain the defence function of beaches.	As sea levels rise, erosion of raised beaches will release sediment into the system, helping to maintain the defence function of the beaches.

CPU 6 Whiting Ness to West Haven						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
		length of CPU 6. • Acts as a breakwater for waves before they reach the sandy shore. • Beach material is often lost in winter due to severe weather conditions, which also cause the beach to drop dramatically		West of Arbroath, the beach at the dune toe will continue to provide natural protection to this stable frontage.		
	Low frontal dune system from Elliot to Corse Hill	• Elliot Links SSSI, south of Arbroath, is 150m wide at its northern and southern points, narrowing to 70m wide midway. The seaward edge of the links is generally a narrow strip of moderately vegetated dune ridge. Inland of the dune ridge is a stable dune area with several abandoned river meanders. • Elliot has a stable sand dune system with abandoned river meanders that supports open dune and fen plant communities, which are uncommon in Angus.		A continuation of natural processes will mean no adverse effects on the stable dune system.	A continuation of natural processes will mean no adverse effects on the stable dune system.	Potential erosion of the frontal dune system as sea levels rise, however the integrity of the dunes as a whole is likely to continue.
	Rock platform with sand beach and frontal dunes from Corse Hill to West Haven	• An extensive marine abrasion platform fringed by a narrow strip of sand, runs along the northern extent.		The fringing rock platforms will continue to provide protection to the shore.	The fringing rock platforms will continue to provide protection to the shore, however, with sea levels rise the influence of the platform may reduce as it becomes submerged	Permanent submergence of fringing rock platforms is possible as sea levels rise, reducing their natural defence function.
	Water bodies include (but are not limited to the following): • The Deil s Head to Carnoustie Coastal Water Body (ID 200078) • Brothock Valley Sand and Gravel Ground Water Body (ID 150272) Carnoustie bedrock and localised sand and gravel aquifers Ground Water Body (ID 150257)	All rivers, lakes, estuaries, coastal waters and groundwater within the study area must achieve a standard of 'good status' by 2015 under the terms of the EU Water Framework Directive (WFD); whereby 'status' is a measure of ecological, chemical, hydrological and morphological quality in surface waters.	To support the achievement of good ecological and chemical status/potential under the EU WFD	Natural processes of coastal water body will not be constrained. No anticipated impact on groundwater and surface water bodies.	Natural processes of coastal water body will not be constrained. No anticipated impact on groundwater and surface water bodies.	Natural processes of coastal water body will not be constrained. No anticipated impact on groundwater and surface water bodies.

CPU 6 Whiting Ness to West Haven						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
Landscape	• Arbroath Harbour and Victoria Park • West Links and Elliot dune systems • Easthaven village	These features are important features contributing to the local landscape character.	To enhance the aesthetic and landscape quality of the coastline	Allowing natural processes will maintain the landscape quality to the south.	Allowing natural processes will maintain the landscape quality to the south. Failing defences and rapid erosion following defence failure may impact on the landscape at Arbroath.	Allowing natural processes will maintain the landscape quality to the south, however, potential impacts on landscape quality at Easthaven if erosion becomes an issue in the long term. Potential impacts on landscape associated with defence failure at Arbroath, however the frontage will start to evolve to a more natural landscape over time.

E1.8 CPU 7 West Haven to Buddon Ness

Key Considerations

CPU 7 is important for tourism and recreation, due to the Carnoustie Golf Course and associated facilities as well as beach front recreation areas. This frontage is also characterised by the residential properties and railway infrastructure along the coastal strip of Carnoustie. Environmental designations along this frontage are associated with the links areas and the Tay Estuary. A key driver along this frontage will be the continued protection of Carnoustie and its golf course while maintaining a recreation beach. Potential conflicts therefore relate to protecting the tourist and residential potential of the area while conserving designated habitats.

Strategic flood and coastal risk management measures proposed by the SMP must not constrain the achievement of good ecological and chemical status/potential for all waterbodies in the SMP area. Opportunities to deliver mitigation identified in the River Basin Management Plan's Programme of Measures should be sought, where possible, during development of the SMP.

CPU 7 West Haven to Buddon Ness						
SEA Receptor	Location/ feature	Key issues and benefits	Objectives that apply	No Active Intervention Scenario		
				Short Term (2012-2032)	Medium Term (2032-2082)	Long Term (2082-2112)
Population and Human health	Residential	• The land use at Westhaven is residential.	To minimise coastal flooding and erosion risk and its impact on people, coastal land use and future development plans	Defences remain in the short term providing flood protection to Carnoustie and Westhaven.	Defences remain in the medium term providing flood protection to Carnoustie and Westhaven.	There will be risk of flooding to parts of Carnoustie and erosion risk will increase to Westhaven in the long term as defences fail.
	Recreational assets	• The frontage at Carnoustie is mainly recreational with golf courses and a high amenity beach with a number of leisure facilities • A coastal footpath extends from the MoD boundary along the beach frontage to West Haven • The main area backing the beach frontage has been upgraded over the years and includes a leisure centre, all-weather outdoor playing surfaces, children's play area, sailing club, paddling pool, car park facilities and seafront walk • Carnoustie Bay is well used for boating activities by the local sailing club also popular with a number of other water sports enthusiasts as it provides a reasonably sheltered environment for surfing, wind surfing, para-surfing and canoeing.	To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management	Defences remain in the short term, no adverse impact.	As defences deteriorate, recreational land will be at risk of overtopping. Following defence failure along Barry Sands East, potential for rapid erosion of the links area, back to a more natural alignment. Potential for loss of / increased flood risk to sections of the golf course.	Potential for rapid erosion of the backing links following defence failure, back to a more natural embayment position. Loss of recreational facilities and increased flood risk to the golf course.
	Designated bathing beach	• The beach at Carnoustie has been identified as a designated bathing beach for purposes of EC Bathing Waters Directive • Children's play area, paddling poor and car park facilities	To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management	The fronting beach may narrow and lower due to the reflective nature of the defences and coastal squeeze against the defences over time.	The intertidal beach will continue to narrow and lower seaward of the remaining structures as sea levels rise.	Potential for rapid erosion of the backing links following defence failure, providing new sediment to the beaches and enhancing the beach. Loss of access to the beach, car parks and other facilities.
	Carnoustie	• The Championship Medal Course	To minimise coastal flooding and erosion	Defences remain in the short term,	Following defence failure along	Potential for rapid erosion of the

CPU 7 West Haven to Buddon Ness						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
	Championship Golf Links	attracts national and international visitors with an increased interest following the return of the British Open in 1999 • A luxury hotel was constructed adjacent to the course in 1999 providing accommodation and conference facilities.	risk to key recreation and tourism assets and activities To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management	no adverse impact.	Barry Sands East, potential for rapid erosion of the links area, back to a more natural alignment. Defences will remain along the Carnoustie frontage, preventing erosion, but potential for increased flood risk to sections of the golf course in this this section. Flood risk to the hotel adjacent to the golf course.	backing links following defence failure, back to a more natural embayment position. Loss of / increased flood risk to parts of the golf course. Increased flood risk to the hotel adjacent to the golf course.
Material Assets and Infrastructure	Main East Coast Railway	• Runs through Carnoustie in the northern section of this unit	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	Defences remain in the short term, no adverse impact.	Defences remain in the medium term, no adverse impact.	Flood and erosion risk to the railway line, Carnoustie Station and car park facilities.
	Pumping station, sewage outfall and pipeline	• Ballaster Park, West Haven CSO (Combined storm outfall)?? – confirmation of asset sought from consultees	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	TBC		
	MoD Training Camp	• To the south end of the unit is the extensive military training range and camp at Barry Buddon including firing ranges • The Camp and training ground occupy the entire Barry Buddon peninsula and is owned by the Ministry of Defence (MoD). • There are 6 dry training areas used for a variety of exercises from battle simulation to orienteering. • Beach landings take place, mainly between the two lighthouses. • a grass airstrip has been made for the planes to pick up troops.	To minimise coastal flood and erosion risk to industry, commercial and economic activities and Ministry of Defence land.	Defences remain in the short term, no adverse impact.	Following defence failure along Barry Sands East, potential for rapid erosion of the MoD training camp links area, back to a more natural alignment. Potential for loss of / increased flood risk to sections of MoD land.	Increased flood risk to and erosion of MoD land.
	Barry Sands East – MoD Exclusion area	• No access is allowed onto approximately 70 hectares because the area contains the remains of live ammunition	To minimise coastal flood and erosion risk to industry, commercial and economic activities and Ministry of Defence land.	Defences remain in the short term, no adverse impact.	Following defence failure along Barry Sands East, potential for rapid erosion of the MoD training camp links including the MoD exclusion area, back to a more natural alignment. Potential for loss of / increased flood risk to sections of MoD exclusion area.	Increased flood risk to and erosion of MoD exclusion area.
Historic Environment	Buddon Ness Barry military links	• A large area of army camps, small arms ranges, assault courses and an airfield. Many of the camp buildings have now been replaced	To minimise coastal flood and erosion risk to scheduled and other nationally, regionally or locally important archaeological and cultural heritage	Defences remain in the short term, no adverse impact.	Following defence failure along Barry Sands East, potential for rapid erosion of the MoD training camp links including the heritage assets,	Increased flood risk to and potential erosion of heritage assets on the coastal fringes of Buddon Ness.

CPU 7 West Haven to Buddon Ness						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
		with modern buildings	assets, sites and their settings		back to a more natural alignment. Potential for increased flood risk to heritage assets in the area.	
Flora, fauna and biodiversity	Part of Firth of Tay and Eden Estuary SPA	• Supports internationally important numbers of non-breeding waterfowl and aggregations of non-breeding bird	To support natural coastal processes and maintain and enhance the integrity of internationally designated nature conservation sites and the favourable condition of their interest features	Natural coastal processes will not be constrained. Integrity of international conservation interest features maintained.	Natural coastal processes will not be constrained. Integrity of international conservation interest features maintained.	Natural coastal processes will not be constrained. Integrity of international conservation interest features maintained.
	Part of Firth of Tay and Eden Estuary Special Area of Conservation (SAC)	• Coastal dune heathland • Shifting dunes • Dune grassland • Humid dune slacks • Shifting dunes with marram	To support natural coastal processes and maintain and enhance the integrity of internationally designated nature conservation sites and the favourable condition of their interest features	Natural coastal processes will not be constrained. Integrity of international conservation interest features maintained.	Natural coastal processes will not be constrained. Integrity of international conservation interest features maintained.	Natural coastal processes will not be constrained. Integrity of international conservation interest features maintained.
	Barry Links Site of Special Scientific Interest (SSSI)	• SSSI for its dune habitats and landforms, vascular plants, bryophytes, invertebrates and breeding birds	To maintain and enhance nationally designated conservation sites and their interest features	Integrity of national conservation interest features maintained. Potential flood risk to freshwater habitats and species.	Integrity of national conservation interest features maintained. Increased flood risk to freshwater habitats and species.	Integrity of national conservation interest features maintained. Increased flood risk to freshwater habitats and species.
	Barry Links GCR	• Designated for Coastal geomorphology e.g. suite of parabolic dunes, elongated 'hairpin' landforms with an exceptionally consistent shape; these are among the best-preserved dunes of this type in Britain.	To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites	Integrity of local conservation interest features maintained.	Integrity of local conservation interest features maintained.	Integrity of local conservation interest features maintained.
Water	Beach and dunes	• Barry Sands East to Buddon Ness is a wide (330m), gently sloping (1o) continuous beach backed by a large rip-rap coastal defence. A dynamic area with parabolic dunes is to the south of the defence, and submerged and inter-tidal sandbanks, the most notable being Gaa Sands, are present near the shore • On areas without coastal protection at Barry, the sand naturally undergoes cycles of erosion and accretion. During summer embryonic dunes accrete on the upper beaches, but during the winters erosion occurs, the beach level drops and sand is lost to the	To maintain and enhance features as a natural flood defence	The fronting beach may narrow and lower due to the reflective nature of the defences and coastal squeeze against the defences over time. The dune system will remain stable and intertidal rock platform will continue to provide natural protection to this stable frontage.	The dunes will remain relatively stable, however, the frontal dune system will be susceptible to storm damage and erosion will occur, albeit at a low rate where defences have failed. The intertidal beach will continue to narrow and lower seaward of the remaining structures as sea levels rise. The intertidal rock platform is expected to continue to provide natural protection to the frontage, however, this influence will reduce with sea level rise.	Potential for rapid erosion of the backing links following defence failure, back to a more natural embayment position, providing new sediment to the beaches and enhancing the beach as a natural from of defence. The rock platform fronting the beach may become submerged as sea levels rise. The natural protection afforded by the rock platform to the beach will therefore diminish over time.

CPU 7 West Haven to Buddon Ness						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
		sea or blown inland.				
	Water bodies include (but are not limited to the following): • Carnoustie to Fife Ness Coastal Water Body (ID 200069) Carnoustie bedrock and localised sand and gravel aquifers Ground Water Body (ID 150257)	All rivers, lakes, estuaries, coastal waters and groundwater within the study area must achieve a standard of 'good status' by 2015 under the terms of the EU Water Framework Directive (WFD); whereby 'status' is a measure of ecological, chemical, hydrological and morphological quality in surface waters.	To support the achievement of good ecological and chemical status/potential under the EU WFD	Natural processes of coastal water body will not be constrained. Potential for saline intrusion to groundwater and surface water bodies.	Natural processes of coastal water body will not be constrained. Potential for increased saline intrusion to groundwater and surface water bodies.	Natural processes of coastal water body will not be constrained. Potential for increased saline intrusion to groundwater and surface water bodies.
Landscape	• Carnoustie beach, shore platform and backing dunes • Golf Course and infrastructure • Dune systems at Buddon Ness	Carnoustie Beach is an important feature in the landscape of this CPU	To enhance the aesthetic and landscape quality of the coastline.	Defences remain so no adverse impacts.	Failing defences and rapid erosion following defence failure at Barry Sands East may impact on the landscape	Potential impacts on landscape associated with defence failure at Carnoustie, however the Barry Sands East frontage will start to evolve to a more natural landscape over time.

E1.9 CPU 8 Buddon Ness to Broughty Castle

Key Considerations

This estuarine frontage is characterised by Buddon Ness's extensive natural sand dune system, beaches and resident MoD training facility which dominate the CPU to the east. To the west the frontage is characterised by recreational and tourist assets, infrastructure, heritage features and residential and commercial buildings relating to the towns of Monifieth and Broughty Ferry. There are potential conflicts on Buddon Ness between the MoD use of Buddon Ness as a training facility and the conservation of it's environmentally designated habitats. A key driver along this frontage will be the continued protection of Monifieth and Broughty Ferry while maintaining the recreation beach and local tourism attractions.

Strategic flood and coastal risk management measures proposed by the SMP must not constrain the achievement of good ecological and chemical status/potential for all waterbodies in the SMP area. Opportunities to deliver mitigation identified in the Rive Basin Management Plan's Programme of Measures should be sought, where possible, during development of the SMP.

CPU 8 Buddon Ness to Broughty Castle						
SEA Receptor	Location/ feature	Key issues and benefits	Objectives that apply	No Active Intervention Scenario		
				Short Term (2012-2032)	Medium Term (2032-2082)	Long Term (2082-2112)
Population and human health	Designated bathing beach	• EC Designated Bathing Water Results (SEPA) designated Monifieth and Broughty Ferry as excellent classification in 2011. • Broughty Ferry beach achieved Blue Flag status in 2004; an Internationally recognised symbol of a well managed beach where water quality meets the maximum legal EU standards and sound environmental management of the beach is promoted.	To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management	Where defences remain, beaches may narrow in front of defences, reducing amenity value, however, accretion in front of some defences at Monifieth playing fields and at Broughty Ferry is expected to continue.	Where defences remain, beaches may narrow in front of defences, reducing their amenity value, accretion in front of some defences at Monifieth playing fields and at Broughty Ferry is expected to continue. Potential loss of beach access points.	Where infrastructure or defences restrict movement beaches will narrow and dune erosion will increase, reducing amenity value. Potential loss of beach access points.
	Informal recreational assets	• Coastal walks at Shoreline Monifieth and broughty Ferry • Broughty is popular for its water sports including several motorised activities • Coastal foot/cycle access runs from the edge of the Riverview playing fields to the start of Tayview Caravan Park and from the western edge of Tayview Caravan Park to Broughty Ferry castle and beyond	To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management	No adverse impacts where defences remain. Flood and erosion risk to informal recreation assets where defences have failed in the short term around Dighty Water.	Flood and erosion risk to recreation assets following defence failure.	Increased flood and erosion risk to recreation assets following defence failure.
	Monifieth Seafront Recreation Area (putting green, tennis courts, football pitches)	• Includes a skate park, play areas for toddlers and teenagers, putting, lookout tower, path network, improved toilet facilities, increased parking and traffic calming.	To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management	Defences remain in the short term providing flood / erosion protection to the recreation area.	Defences remain and dunes will continue to front the football pitches providing flood / erosion protection. Failure of defences at the Monifieth recreation area will result in erosion / flood risk to the site.	Increased flood / erosion risk to recreation areas at Monifieth.

CPU 8 Buddon Ness to Broughty Castle						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
	Broughty Ferry Castle, putting green, pavilion	• Broughty Ferry links offer several leisure facilities including tennis courts and putting,	To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management	Defences remain, providing protection to the castle.	Defences remain, providing protection to the castle.	Flood risk to the castle if defences fail.
	Caravan parks	• Monifieth Bay is home to two camping and caravan sites, Riverview and Tayview Caravan Parks. • Both sites are busy throughout the holiday seasons providing facilities for year round static caravans as well as touring caravans.	To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management	Defences remain in the short term providing flood / erosion protection to the Caravan Parks	Riverside Caravan Park defences remain providing flood / erosion protection. Failure of defences at Tayview Caravan Park will result in erosion / flood risk to the site.	Increased flood / erosion risk to both caravan parks.
Material Assets and Infrastructure	MoD Training Camp	• The Camp and training ground occupy the entire Barry Buddon peninsula and is owned by the Ministry of Defence (MoD). • There are 6 dry training areas used for a variety of exercises from battle simulation to orienteering. • Beach landings take place, mainly between the two lighthouses • A grass airstrip has been made for the planes to pick up troops.	To minimise coastal flood and erosion risk to industry, commercial and economic activities and Ministry of Defence land.	Naturally evolving dune system, fluctuating erosion and accretion along Buddon Ness, no adverse impacts.	Naturally evolving dune system, fluctuating erosion and accretion along Buddon Ness, no adverse impacts.	Naturally evolving dune system, fluctuating erosion and accretion along Buddon Ness, no adverse impacts.
	Access to Port of Dundee	• Access to port to be maintained	To minimise the impact of policies on marine operations and activities	No adverse impacts	No adverse impacts	No adverse impacts
	Water main, sewage outfalls and pipelines	• Marine Avenue, Monifieth (Combined storm outfall) • Grange Road, Monifieth (Combined storm outfall) • Dighty Burn, Monifieth (Short Sea) • South Balmossie, Monifieth (Long Sea) • Broughty Castle, Broughty Ferry (Short Sea) • British Gas national pipeline	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	TBC		
	Minor access roads and facilities associated	• Local tracks on Buddon Ness to training facilities	To minimise coastal flood and erosion risk to critical infrastructure and maintain	No adverse impacts	No adverse impacts	No adverse impacts

CPU 8 Buddon Ness to Broughty Castle						
SEA Receptor	**Location/ feature**	**Key issues and benefits**	**Objectives that apply**	**No Active Intervention Scenario**		
				Short Term (2012-2032)	**Medium Term (2032-2082)**	**Long Term (2082-2112)**
	with Camp		critical services			
	Minor roads	• Local roads provide access to settlements and some other locations along the coastline.	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	Potential flood risk to minor roads.	Potential flood risk to minor roads increases with sea level rise.	Potential flood risk to minor roads continues to increase with increased sea level rise.
	Main East Coast Railway	• The main East Coast Railway Line runs very close to the coast along part of the unit.	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	Potential erosion risk to the railway west of Dighty Water following defence failure.	Increased erosion risk to the railway following defence failure east of Dighty Water.	Increased erosion and flood risk to the East Coast Mainline
Historic Environment	Buddon Ness: Old High Lighthouse, Low Lighthouse and ice house	• The high lighthouse is a tall circular tower built by the Stevensons in the mid 18th Century. The low lighthouse was built by the Stevensons in the 19th Century and is a circular building like the high lighthouse • Sites of local importance	To minimise coastal flood and erosion risk to scheduled and other nationally, regionally or locally important archaeological and cultural heritage assets, sites and their settings	Potential flood risk to Low Lighthouse	Increased flood risk to Low Lighthouse	Increased frequency of flood risk to Low Lighthouse
	Barry Military Links: Barry Camp and Buddon Camp	• The camp is recognised for its military importance within the 20th Century. • Sites of local importance	To minimise coastal flood and erosion risk to scheduled and other nationally, regionally or locally important archaeological and cultural heritage assets, sites and their settings	Potential flood risk to areas of the camp.	Potential flood risk to areas of the camp.	Potential flood risk to areas of the camp.
	Broughty Ferry Conservation area	• An area of special architectural and historic interest. Need to ensure that proposals do not affect the preservation or enhancement of the established character and appearance.	To minimise coastal flood and erosion risk to scheduled and other nationally, regionally or locally important archaeological and cultural heritage assets, sites and their setting.	No adverse impacts.	Potential for deterioration of established character and appearance as seawall deteriorates.	Deterioration of established character and appearance following failure of seawall.
	Broughty Castle	• Broughty Castle was built in 1496 and allowed to fall into decay after 1603. The castle was reconstructed and extended following purchase by the government in 1855. It has now been completely restored and operates as a museum • Scheduled Monument • A-Listed Building	To minimise coastal flood and erosion risk to scheduled and other nationally, regionally or locally important archaeological and cultural heritage assets, sites and their setting.	Defences remain, providing protection to the castle.	Defences remain, providing protection to the castle.	Flood risk to the castle if defences fail.
Flora, fauna and biodiversity	Part of Firth of Tay and Eden Estuary cSAC		To support natural coastal processes and maintain and enhance the integrity of internationally designated nature conservation sites and the favourable condition of their interest features	Natural coastal processes will not be constrained. Integrity of international conservation interest features maintained.	Natural coastal processes will not be constrained. Integrity of international conservation interest features maintained.	Natural coastal processes will not be constrained. Integrity of international conservation interest features maintained.
	Part of Firth of Tay and	• Supports internationally important	To support natural coastal processes and	Natural coastal processes will not be	Natural coastal processes will not be	Natural coastal processes will not be

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	Eden Estuary SPA and Ramsar site	numbers of non-breeding waterfowl and aggregations of non-breeding birds	maintain and enhance the integrity of internationally designated nature conservation sites and the favourable condition of their interest features	constrained. Integrity of international conservation interest features maintained.	constrained. Integrity of international conservation interest features maintained.	constrained. Integrity of international conservation interest features maintained.
	West part of Barry Buddon SSSI	• Barry Links is an SSSI for its dune habitats and landforms, vascular plants, bryophytes, invertebrates and breeding birds.	To maintain and enhance nationally designated conservation sites and their interest features	Integrity of national conservation interest features maintained. Potential flood risk to freshwater habitats and species.	Integrity of national conservation interest features maintained. Increased flood risk to freshwater habitats and species.	Integrity of national conservation interest features maintained. Increased flood risk to freshwater habitats and species.
	Monifieth Bay SSSI	• Inter-tidal habitat and feeding area for internationally important numbers of wintering waders and ducks.	To maintain and enhance nationally designated conservation sites and their interest features	Integrity of national conservation interest features maintained.	Integrity of national conservation interest features maintained.	Integrity of national conservation interest features maintained.
	GCR at Barry Buddon	• Designated for Coastal geomorphology e.g. suite of parabolic dunes, elongated 'hairpin' landforms with an exceptionally consistent shape; these are among the best-preserved dunes of this type in Britain.	To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites	Integrity of local conservation interest features maintained.	Integrity of local conservation interest features maintained.	Integrity of local conservation interest features maintained.
Water	Sand beach and dunes	• Open coast and Ness system is one of the largest sites on the East coast (1641.4 ha) extending for almost 23km. Forming a narrow belt of open dune coast for much of this distance, the site is almost 4km wide where a very large foreland system (Barry Buddon) has developed at the mouth of the River Tay. • Monifieth Bay inter-tidal area stretches along the coast for almost 6km. It is preceded by narrow (200m) inter-tidal sand flat at Buddon Ness, which gains width towards Monifieth reaching a greatest width of 1km from the HWMOST.	To maintain and enhance features as a natural flood defence	Where defences remain, beaches may narrow in front of defences, reducing their function of a natural defence, however, accretion in front of defences at Monifieth playing fields and at Broughty Ferry is expected to continue. Beaches and dune system at Buddon Ness will continue to provide natural protection to this stable frontage.	Where defences remain, beaches may narrow in front of defences, reducing their function of a natural defence, accretion in front of defences at Monifieth playing fields and at Broughty Ferry is expected to continue. Beaches and dune system at Buddon Ness will continue to provide natural protection to this stable frontage.	Where infrastructure or defences restrict movement beaches will narrow and dune erosion will increase. Following failure of the defences east of Dighty water the beach will continue to narrow and lower as sea levels rise due to coastal squeeze against the railway line. Beaches and dune system at Buddon Ness will continue to provide natural protection to this stable frontage.
	Water bodies include (but are not limited to the following): • Carnoustie to Fife Ness Coastal Water Body (ID 200069)	All rivers, lakes, estuaries, coastal waters and groundwater within the study area must achieve a standard of 'good status' by 2015 under the terms of the EU Water Framework Directive (WFD); whereby 'status' is a measure of ecological, chemical, hydrological	To support the achievement of good ecological and chemical status/potential under the EU WFD	Natural processes of coastal and transitional water bodies will not be constrained. Potential for saline intrusion to groundwater and surface water bodies.	Natural processes of coastal and transitional water bodies will not be constrained. Potential for increased saline intrusion to groundwater and surface water bodies.	Natural processes of coastal and transitional water bodies will not be constrained. Potential for increased saline intrusion to groundwater and surface water bodies.

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	• Lower Tay Estuary Transitional Water Body (ID 200438) • Carnoustie bedrock and localised sand and gravel aquifers Ground Water Body (ID 150257) • Dundee bedrock and localised sand and gravel aquifers Ground Water Body (ID 150256)	and morphological quality in surface waters.				
Landscape	• Barry sands west, a continuation of the beach at Buddon Ness • Monifieth Bay • Monifieth recreation ground and caravan parks • The Dighty Water splits Monifieth Beach from the beach that runs west to Broughty Ferry. • Links area at Broughty Ferry • Broughty Ferry town and Castle fronted by a wide sandy beach	Barry Sands and Monifieth Bay are important elements contributing to the landscape character of this CPU.	To enhance the aesthetic and landscape quality of the coastline	Allowing natural processes will maintain the landscape quality at Buddon Ness. Failing defences may impact on the landscape at Monifieth.	Allowing natural processes will maintain the landscape quality at Buddon Ness. Failure of defences may impact on the landscape at Monifieth and Broughty Ferry.	Allowing natural processes will maintain the landscape quality of Buddon Ness. Potential impacts on landscape associated with defence failure, however the frontage will start to evolve to a more natural landscape over time.