

Detailed Assessment Matrix

Traffic light key:

++	Moderate to Major Beneficial – Significant Effect	Action is likely to have a direct, major, long term positive effect on the SEA receptor/ objectives.
+	Minor Beneficial	Action is likely to have some positive influence on the SEA receptor/ objectives
0	Neutral	Action is assessed as being neutral or having no influence/ effect on the SEA receptor/ objectives
–	Minor Adverse	Action is likely to have some minor negative impact on the SEA receptor/ objectives and could be addressed through mitigation
– –	Moderate to Major Adverse – Significant Effect	Action is likely to result in a major, long term, negative effect on the SEA receptor/ objective. Significant Effect.

Policy Approaches:

NAI – No Active Intervention

HTL – Hold the Line

MR – Managed Realignment

Scenario Area I – Montrose

Revised Management Units	Draft Preferred Scenario		
	0-20 yrs	20-50 yrs	50-100 yrs
MU 1/1 Montrose Bay (Milton Ness to Montrose Links)	NAI	NAI	NAI
MU 1/2 Montrose Golf Links	MR	MR	MR
MU 1/3 (a) Splash (The Faults)	HTL	HTL	MR
MU 1/3 (b) South Links Holiday Park	HTL	HTL	MR
MU 1/4 GlaxoSmithKline	HTL	HTL	HTL

Policy Scenario Area I: Montrose				
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/ Environmental Opportunities
Population and human health				
Small settlement at Kinnaber	<ul style="list-style-type: none"> Isolated residential properties 	To minimise coastal flooding and erosion risk and its impact on people, coastal land use and future development plans.	<p style="text-align: center;">--</p> <p>Short term: Potential flood risk to isolated properties alongside the River North Esk channel.</p> <p>Medium term: Increased flood risk to isolated properties alongside the River North Esk channel.</p> <p>Long term: Increased frequency of flood risk to isolated properties alongside the River North Esk channel.</p>	Some assets affected by flooding or erosion, could be relocated further inland. Consideration should be given to the realignment of the Golf Course due to continuing erosion.
Montrose town, residential and industry	<ul style="list-style-type: none"> 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 	<p>To minimise coastal flooding and erosion risk and its impact on people, coastal land use and future development plans.</p> <p>To minimise the impact of policies on marine operations and activities</p>	<p style="text-align: center;">+</p> <p>Short term: Continued protection of town and port from flooding</p> <p>Medium term: As above</p> <p>Long term: As above</p>	Undertake consultation with key stakeholders and private owners in developing an adaption plan to ensure an acceptable approach is developed.
GlaxoSmithKline	<ul style="list-style-type: none"> 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 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.	<p style="text-align: center;">+</p> <p>Short term: Continued protection of GlaxoSmithKline from flooding. The frontage is likely to remain stable as the recharged beach, dune planting and groyne system helps retain sediment in this location.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	

Policy Scenario Area 1: Montrose					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/ Environmental Opportunities	
Bathing and recreational beach	<ul style="list-style-type: none"> Montrose beach achieved Blue Flag status in 2004 	To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities	+	<p>Short term: The amenity value of the beach will be maintained, if the upper beach is recharged as part of the scheme.</p> <p>Medium term: As above</p> <p>Long term: Removal of defences and roll back of the beach would result in changes to the amenity beach at first. Natural readjustment of the shoreline is likely to release sediment into the system, which will feed the beach. Over time, roll-back of the dunes and dune management may increase the extent of exposed beach at high tide and there will be an overall retention of the amenity value of the beach.</p>	
Recreational facilities	<ul style="list-style-type: none"> Two 18-hole golf courses in north of unit 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 	To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities	-	<p>Short term: The set-back of some northern parts of the golf course will be required due to the continued erosion of the dunes. However, most other recreational assets including the Splash area will continue to be protected.</p> <p>Medium term: As above</p> <p>Long term: Risk to recreational facilities at Splash and the caravan park under a policy of MR.</p>	
South Links Holiday Park	<ul style="list-style-type: none"> Privately run caravan park catering for summer visitors. Formal access to the beach 	To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities	+	<p>Short term: Continued protection of the caravan park.</p> <p>Medium term: As above</p> <p>Long term: Parts of the park will need to be relocated due to the increased risk of erosion under a MR policy</p>	
Historic landfill site at Montrose	<ul style="list-style-type: none"> The historic landfill is located alongside the railway line south of the Tayock River. 	To minimise coastal flooding and erosion risk and its impact on people, coastal land use and future development plans.	+	<p>Short term: Continued flood and erosion protection to the historic landfill area</p> <p>Medium term: As above</p> <p>Long term: As above</p>	
Material Assets and Infrastructure					
Navigation route to Montrose Harbour	<ul style="list-style-type: none"> Need to maintain safe navigation and access to the harbour 	To minimise the impact of policies on marine operations and activities	+	<p>Short term: Continued protection of harbour infrastructure. Potential for beneficial use of River South Esk dredged material along the frontage as part of the scheme.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	No mitigation required

Policy Scenario Area I: Montrose					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)		Mitigation Measures/ Environmental Opportunities
Minor access roads and car parks	<ul style="list-style-type: none"> 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	+	<p>Short term: Continued protection to the Splash car park and minor access roads.</p> <p>Medium term: As above</p> <p>Long term: Erosion risk to Trail Road and the Splash car park under a MR policy. However, accommodation space available to relocate these further landward.</p>	
Sewage outfall: St Cyrus (untreated) Montrose Water Treatment Works	<ul style="list-style-type: none"> 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). 			<p>Short term: Continued protection of treatment works.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	
Historic Environment					
Little Kinnaber and Fisherhills Fort and Barrows Scheduled Monuments (SMs)	<ul style="list-style-type: none"> Crop mark sites identified by aerial photography 	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.	0	<p>Short term: No adverse impacts in the short term</p> <p>Medium term: No adverse impacts in the medium term</p> <p>Long term: No adverse impacts in the long term</p>	No mitigation required
Kinnaber House	<ul style="list-style-type: none"> Listed building 		0	<p>Short term: No adverse impacts in the short term</p> <p>Medium term: No adverse impacts in the medium term</p> <p>Long term: No adverse impacts in the long term</p>	
Montrose Airfield and associated buildings	<ul style="list-style-type: none"> Listed building 		0	<p>Short term: No adverse impacts in the short term</p> <p>Medium term: No adverse impacts in the medium term</p> <p>Long term: No adverse impacts in the long term</p>	
Flora, fauna and biodiversity					
St Cyrus and Kinnaber Links Site of Special Scientific Interest (SSSI)	<ul style="list-style-type: none"> Notified for its coastal cliffs and dunes, vascular plants and lichens, breeding birds and insects 	<p>To maintain and enhance nationally designated conservation sites and their interest features.</p> <p>To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites</p>	-	<p>Short term: 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.</p> <p>Medium term: 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.</p>	Sea level rise may increase risk of flooding. This should be monitored alongside SNH's site condition monitoring. Secondary compensation habit may be required to retain freshwater/terrestrial

Policy Scenario Area I: Montrose					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/ Environmental Opportunities	
				habitats and species.	
St Cyrus National Nature Reserve (NNR) and Local Nature Reserve (LNR)	<ul style="list-style-type: none"> 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 		<p>Long term: 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.</p> <p>Short term: 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.</p> <p>Medium term: 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.</p> <p>Long term: 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.</p>		
St Cyrus Scottish Wildlife Trust Nature Reserve	<ul style="list-style-type: none"> Landscape and conservation value 	To avoid adverse impacts on, conserve and enhance the designated interest of locally conservation sites.	+	<p>Short term: Integrity of local conservation interest features maintained.</p> <p>Medium term: Integrity of local conservation interest features maintained.</p> <p>Long term: Integrity of local conservation interest features maintained.</p>	
Fisheries					
Salmon / trout fishing	<ul style="list-style-type: none"> 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	0	<p>Short term: No adverse impacts in the short term</p> <p>Medium term: No adverse impacts in the medium term unless there are significant change in water quality</p> <p>Long term: No adverse impacts in the long term unless there are significant changes in water quality</p>	No mitigation required
Geology and Soils					
Mixture of grade 2 and 3 agricultural land at Charleton and Kinnaber	<ul style="list-style-type: none"> 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	-	<p>Short term: Potential flood risk to small sections of rough grazing land adjacent to the River North Esk channel.</p> <p>Medium term: Increased flood risk to small sections of rough grazing land adjacent to the River North Esk channel.</p> <p>Long term: Increased frequency of flood risk to small sections of rough grazing land adjacent to the River North Esk channel.</p>	Undertake consultation with key stakeholders and landowner in developing an adaption plan.

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Water					
Beach	<ul style="list-style-type: none"> Bay dune and spit complex covering 479 ha, extending 6km south from the River North Esk to Montrose. Consists of foredune, spit, sand-covered shingle, conifer plantations, acidic dune grassland, patches of heath and amenity grassland. 	To maintain and enhance features as a natural flood defence and identify new areas for coastal habitat creation as natural flood defences	+	<p>Short term: No adverse impacts as the beach and spit system is able to evolve naturally in the north. To the south, some upper beach restoration will help maintain the beach.</p> <p>Medium term: As above</p> <p>Long term: Removal of defences and roll back of the beach would result in changes to the beach at first. Natural readjustment of the shoreline is likely to release sediment into the system, which will feed the beach. Over time, roll-back of the dunes and dune management may increase the extent of exposed beach at high tide enhancing the beach as a natural defence.</p>	No mitigation required
Dune system	<ul style="list-style-type: none"> Dunes run most of the length of CPU I. 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 and identify new areas for coastal habitat creation as natural flood defences	+	<p>Short term: No adverse impacts as the dune system is able to evolve naturally in the north. Some dune management will be undertaken under a managed realignment policy along the golf course frontage to maintain the integrity of the dunes as a natural flood defence. To the south, defences will remain and prevent dunes acting as a form of defence.</p> <p>Medium term: As above</p> <p>Long term: Dune management will be undertaken under MR in the south to restore / maintain the integrity of the dunes as a natural defence.</p>	
Waterbodies include (but are not limited to) the following: <ul style="list-style-type: none"> 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) 	<ul style="list-style-type: none"> All estuaries, coastal waters and where relevant rivers, lakes 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 under the EU WFD	+	<p>Short term: The dune and cliff systems to the north and the dune systems in the mid-reach will function near naturally, with dunes rolling backwards where topography allows this. To the south, beach restoration and stabilisation will maintain this inter-tidal feature, without significant coastal "squeeze" or detriment to the coastal water body's status.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	

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Landscape				
<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 character of the coastline.	<div style="background-color: #0070C0; color: white; text-align: center; padding: 10px; font-weight: bold; font-size: 24px;">0</div> <p>Short term: Allowing natural processes will maintain the landscape character to the north. Maintaining the defences in the south is unlikely to change the character of the landscape but will maintain the unnatural alignment of the coast.</p> <p>Medium term: Allowing natural processes will maintain the landscape character to the north. As more substantial defences are required in the south, the upgrading of defences has the potential to change the character of the landscape and defence works would need to be designed in a sympathetic manner to the local environment.</p> <p>Long term: As above</p>	No mitigation required

Scenario Area 2 – Montrose Basin

Revised Management Units	Draft Preferred Scenario		
	0-20 yrs	20-50 yrs	50-100 yrs
MU 2/1 (a) Montrose Port (north bank – Glaxo to A92 bridge)	HTL	HTL	HTL
MU 2/1 (b) Montrose Port (south bank –A92 bridge to Ferryden)	HTL	HTL	HTL
MU 2/2 (a) Montrose West (A92 Bridge to the end of railway defences)	HTL	HTL	HTL
MU 2/2 (b) Montrose West (Railway defences to Tayock River)	HTL	HTL	HTL
MU 2/3 (a) Tayock (Tayock village)	HTL	HTL	HTL
MU 2/3 (b) Tayock (Tayock Cemetery)	HTL	HTL	HTL
MU 2/4 (a) West Montrose Basin (west of Tayock)	HTL	HTL	HTL
MU 2/4 (b) West Montrose Basin (Bridge of Dun)	MR	MR	MR
MU 2/4 (c) West Montrose Basin (Old Montrose)	HTL	HTL	HTL
MU 2/5 Old Montrose to Railway Bridge	NAI	NAI	NAI
MU 2/6 Rossie Island to A92	HTL	HTL	HTL
MU 2/7 Ferryden	HTL	HTL	HTL
MU 2/8 Ferryden to Scurdie Ness	NAI	NAI	NAI

Policy Scenario Area 2: Montrose Basin				
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities
Population and Human Health				
Residential development	<ul style="list-style-type: none"> 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.	++	Short term: Continued flood protection to Montrose Town. Medium term: As above Long term: As above
Recreational activities	<ul style="list-style-type: none"> 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	-	Short term: Minimal impact on recreational activities Medium term: Minimal impacts on most recreational activities, although there will be an increasing flood risk to some coastal walks and the wildlife visitor centre. Long term: As above
Sleepyhillock Cemetery	<ul style="list-style-type: none"> Cemetery on northern edge of Montrose Basin 	To minimise coastal flooding and erosion risk and its impact on people, coastal land use and future development plans.	+	Short term: Continued erosion protection to the cemetery. Medium term: As above Long term: As above
Material Assets and Infrastructure				
(Montrose Port) Harbour Quay for national and international shipping imports / exports	<ul style="list-style-type: none"> 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	+	Short term: Continued flood protection to Montrose Port. Medium term: As above Long term: As above
Main East Coast Railway	<ul style="list-style-type: none"> 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	+	Short term: Continued flood protection to the East Coast Railway. Medium term: As above Long term: As above
A92 & access to properties along Esk Road (A935)	<ul style="list-style-type: none"> 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	+	Short term: Continued flood protection to Esk Road and the A92. Medium term: Continued flood protection to Esk Road and the majority of the A92 with the exception of a short length on the southern side of Montrose Basin Long term: As above
Sewage outfall, pumping station	<ul style="list-style-type: none"> Three outfalls all of which are combined storm outfalls 	To minimise coastal flood and erosion risk to	+	Short term: Assets will continue to be protected by defences.

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Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities	
and pipe line		critical infrastructure and maintain critical services		Medium term: As above Long term: As above	
Historic Environment					
Montrose Town Conservation Area (Outstanding)	<ul style="list-style-type: none"> 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.	+	Short term: Continued flood protection to the Conservation Area. Medium term: As above Long term: As above	No mitigation is required
Dronners Dyke, cropmark sites at various locations around the basin, Roman camp at Dun, Bridge of Dun, including a number of locally important sites	<ul style="list-style-type: none"> 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.	+	Short term: Continued flood protection to heritage features and crop mark sites. Medium term: As above Long term: As above	
Flora, Fauna and Biodiversity					
Montrose Basin Ramsar site and SPA	<ul style="list-style-type: none"> Supports over 20,000 waterfowl including many internationally important species, and aggregations of non-breeding birds. 	<p>To support natural coastal processes</p> <p>To maintain and enhance the integrity of internationally designated nature conservation sites and the favourable condition of their interest features</p>	--	Short term: Potential for coastal squeeze impacts on intertidal habitats (which support designated birds). However, habitats are anticipated to remain stable overall due to the potential coastal squeeze and gradual silting up of the basin, and because the existing defences are not considered to be adversely affecting the designated sites currently. Potential for intertidal habitat creation in the west of the basin (outside the designated site) on agricultural land has the potential to support the integrity of the designated sites. However, although works would not directly affect the designated area, there is potential to impact on them if the site selected for managed realignment supports qualifying species. The designated freshwater assets will be maintained. Medium term: As above Long term: As above Potential significant effect – HRA required	With areas of managed realignment there is potential for intertidal habitat creation in the west of the basin (outside the designated site) to offset coastal squeeze and provide future accommodation space under rising sea levels. Potential impacts on qualifying species by the proposed works will be avoided through detailed scheme level assessment and mitigation (e.g. avoiding sensitive habitat, timings of to avoid fish and bird disturbance), in agreement with SNH. Ongoing monitoring of erosion / accretion within Montrose Basin to inform future SMP reviews.
Montrose Basin SSSI	<ul style="list-style-type: none"> Designated for inter-tidal mudflats saltmarsh, marsh, saline lagoons, vascular plants, breeding wildfowl and wintering waders, stratigraphy 	<p>To support natural coastal processes</p> <p>To maintain and enhance nationally designated conservation sites and their interest features</p>	--	Short term: Potential for coastal squeeze impacts on intertidal habitats (which support designated birds). However, habitats are anticipated to remain stable overall due to the potential coastal squeeze and gradual silting up of the basin, and that the existing defences are not considered to be adversely affecting the designated sites currently. Potential for intertidal habitat creation in the west of the basin (outside the designated site) on agricultural land, which may support the integrity of the designated sites. However, although works would not directly affect the designated area, there is potential to impact on them if the managed realignment site supports qualifying species.	

Policy Scenario Area 2: Montrose Basin				
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities
			<p>Medium term: As above</p> <p>Long term: As above</p>	
Montrose Basin LNR	<ul style="list-style-type: none"> Designated for reed swamps, plant communities, wildfowl and waders and invertebrates 	<p>To support natural coastal processes</p> <p>To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites</p>	<p>-</p> <p>Short term: Potential for coastal squeeze impacts on intertidal habitats (which support designated birds). However, habitats are anticipated to remain stable overall due to the potential coastal squeeze and gradual silting up of the basin, and that the existing defences are not considered to be adversely affecting the designated sites currently.</p> <p>Potential for intertidal habitat creation in the west of the basin (outside the designated site) on agricultural land, which may support the integrity of the designated sites. However, although works would not directly affect the designated area, there is potential to impact on them if the managed realignment site supports qualifying species.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	
Scottish Wildlife Trust Nature Reserve	<ul style="list-style-type: none"> 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. 	<p>To support natural coastal processes</p> <p>To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites</p>	<p>-</p> <p>Short term: Potential for coastal squeeze impacts on intertidal habitats (which support designated birds). However, habitats are anticipated to remain stable overall due to the potential coastal squeeze and gradual silting up of the basin, and that the existing defences are not considered to be adversely affecting the designated sites currently.</p> <p>Potential for intertidal habitat creation in the west of the basin (outside the designated site) on agricultural land, which may support the integrity of the designated sites. However, although works would not directly affect the designated area, there is potential to impact on them if the managed realignment site supports qualifying species.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	
Scurdie Ness Geological Conservation Review (GCR)	<ul style="list-style-type: none"> 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 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. 	<p>To support natural coastal processes</p> <p>To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites</p>	<p>0</p> <p>Short term: Natural coastal processes are key to maintaining the integrity of the geological site through the exposure of geological features.</p> <p>Medium term: Natural coastal processes are key to maintaining the integrity of the geological site through the exposure of geological features.</p> <p>Long term: 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 rise and increased storminess.</p>	
Regionally Important Geological / Geomorphologic Site (RIGS)		To avoid adverse impacts on, conserve and enhance the designated interest of local	<p>0</p> <p>Short term: The integrity of the site will be maintained as natural</p>	

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Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities
at Maryton		conservation sites	erosion continues. Medium term: As above. Long term: As above	
Fisheries				
Salmon and Sea Trout fishery, sailing, angling, bait-digging	<ul style="list-style-type: none"> 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	0 Short term: No adverse impacts in the short term Medium term: No adverse impacts in the medium term unless there are significant changes in water quality Long term: No adverse impacts in the long term unless there are significant changes in water quality	No mitigation required
Geology and soils				
Mainly grade 3 agricultural land, with small areas of grade 2	<ul style="list-style-type: none"> 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	- Short term: Flooding of some agricultural land in a realigned area to the west of the Basin with associated loss of productivity. Protection of agricultural land elsewhere. Medium term: As above Long term: As above	No mitigation has been identified for losses of agricultural land. Undertake consultation with key stakeholders and landowner to discuss options. Consider cumulative impacts from loss of agricultural land from nearby developments.
Water				
Water bodies include (but are not limited to) the following: <ul style="list-style-type: none"> Montrose Basin Transitional Water Body (ID 200079) River South Esk River Water Body (ID 5799) Montrose bedrock and localised sand and gravel aquifers Ground Water Body (ID 150267) 	<ul style="list-style-type: none"> All estuaries, coastal waters and where relevant rivers, lakes 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 under the EU WFD	- Short term: Maintaining the defence line along the northern shores of Montrose Basin will result in gradual loss of mudflats over a significant percentage of the water body's perimeter, with potential deleterious effects on water body status for example by impacting benthic invertebrates. However, the majority of the shore along the west and south will continue to evolve naturally. Medium term: As above Long term: As above	With areas of managed realignment there is potential for intertidal habitat creation in the west of the basin to offset coastal squeeze and provide accommodation space under rising sea levels.
Landscape				
Relatively undeveloped natural estuarine ecosystem Mudflats, sands, mussel beds, channels and areas of algae	<ul style="list-style-type: none"> Mudflats dominate the landscape within Montrose Basin. 	To enhance the aesthetic value and landscape character of the coastline	- Short term: Maintaining the defences in the eastern part of the basin may change the character of the landscape through the gradual loss of mudflats. Allowing natural processes elsewhere is likely to be beneficial to the existing landscape character, though there is likely to be a visible	With areas of managed realignment there is potential for intertidal habitat creation in the

Policy Scenario Area 2: Montrose Basin				
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities
<p>create a varied landscape</p> <p>Montrose town with its tall spire, the Harbour and the main East Coast Railway bind the Basin along its eastern side.</p> <p>The north shore of the Basin is agricultural land, mostly used for arable farming.</p>			<p>change in land use in the west of the basin, as agricultural land is allowed to flood and set-back embankments are constructed.</p> <p>Medium term: As more substantial defences are required in the eastern part of the basin, the upgrading of defences has the potential to change the character of the landscape and defence works would need to be designed in a sympathetic manner to the local environment.</p> <p>Allowing natural processes elsewhere is likely to be beneficial to the existing landscape character.</p> <p>Long term: As above</p>	<p>western parts of the basin in an area of agricultural land to offset coastal squeeze and provide accommodation space under rising sea levels.</p>

Scenario Area 3 – Scurdie Ness to Rickle Craig

Revised Management Units	Draft Preferred Scenario		
	0-20 yrs	20-50 yrs	50-100 yrs
MU 3/1 Scurdie Ness to Rickle Craig	NAI	NAI	NAI

Policy Scenario Area 3: Scurdie Ness to Rickle Craig				
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities
Population and Human Health				
Recreational activities	<ul style="list-style-type: none"> Precious gem collecting Birdwatching Sea angling 	<p>To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities</p> <p>To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management</p>	<p>0</p> <p>Short term: No adverse impacts</p> <p>Medium term: No adverse impacts</p> <p>Long term: No adverse impacts</p>	No mitigation required

Policy Scenario Area 3: Scurdie Ness to Rickle Craig					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities	
Material Assets and Infrastructure					
East coast Rail line	<ul style="list-style-type: none"> Situated adjacent to the foreshore. 	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	-	<p>Short term: Minimal erosion risk to the railway, but potential risk of cliff falls.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	Risk to the railway and potential cliff falls to be to be monitored at this location. Opportunities to re-reroute the railway line further inland on a more sustainable alignment should be investigated.
Minor farm access roads	<ul style="list-style-type: none"> 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	-	<p>Short term: Minimal erosion risk to farm access routes, but potential risk of cliff falls.</p> <p>Medium term: Minimal erosion risk to farm access routes, but potential risk of cliff falls.</p> <p>Long term: Minimal erosion risk to farm access routes, but potential risk of cliff falls.</p>	
Small harbours	<ul style="list-style-type: none"> Usan (small and natural) harbour 	To minimise the impact of policies on marine operations and activities	0	<p>Short term: No adverse impacts on small harbour activities.</p> <p>Medium term: No adverse impacts on small harbour activities.</p> <p>Long term: No adverse impacts on small harbour activities.</p>	
Historic Environment					
Scurdie Ness West beacon, Montrose Leading Lights, Scurdie Ness Lighthouse	<ul style="list-style-type: none"> 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.	0	<p>Short term: Minimal erosion predicted, therefore minimal impacts on these structures.</p> <p>Medium term: Minimal erosion predicted, therefore minimal impacts on these structures.</p> <p>Long term: Minimal erosion predicted; however, there may be potential impact on these structures from cliff falls.</p>	The likely impacts of the preferred SMP policy option on the Boddin Lime Kilns will be investigated further at a more local level with Historic Scotland. Where the avoidance of the features from erosion is not possible, mitigation likely be in the form of excavation and recording
Boddin Point Lime Kilns	<ul style="list-style-type: none"> 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.	--	<p>Short term: Continued erosion risk to Lime Kilns, loss of parts of historic asset.</p> <p>Medium term: Increased erosion risk to Lime Kilns and loss of parts of historic asset.</p> <p>Long term: Potential loss of lime kilns.</p>	
Fishtown of Usan, Old Ice house and lookout Tower	<ul style="list-style-type: none"> Grade C listed harbour and Sites of Local Importance 		0	<p>Short term: No adverse impacts.</p> <p>Medium term: No adverse impacts.</p> <p>Long term: No adverse impacts.</p>	
Usan Village, Salt House, Chapel of St Skate and usan Harbour	<ul style="list-style-type: none"> Grade B/C listed buildings and Sites of Local Importance 		0	<p>Short term: No adverse impacts.</p>	

Policy Scenario Area 3: Scurdie Ness to Rickle Craig					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)		Mitigation Measures/Environmental Opportunities
				Medium term: No adverse impacts. Long term: No adverse impacts.	
Flora, fauna and biodiversity					
Rickle Craig to Scurdie Ness SSSI	<ul style="list-style-type: none"> Saltmarsh, coastal grassland, snails, geology 	<p>To support natural coastal processes</p> <p>To maintain and enhance nationally designated conservation sites and their interest features.</p>	++	Short term: Natural processes are allowed to continue, which is likely to be beneficial to the nationally designated site. Potential for loss of existing saltmarsh due to ongoing erosion under storm conditions but this will not be a result of SMP policy. Medium term: As above Long term: As above	No mitigation required
Scurdie Ness GCR site Usan Harbour GCR site The area around Scurdie Ness	<ul style="list-style-type: none"> 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. 	<p>To support natural coastal processes</p> <p>To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites</p>	+	Short term: Integrity of local conservation interest features maintained. Medium term: Integrity of local conservation interest features maintained. Long term: Integrity of local conservation interest features maintained.	No mitigation required
Geology and Soils					
Mainly grade 3 agricultural land with grade 2 situated inland	<ul style="list-style-type: none"> 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	0	Short term: Minimal loss of agricultural land to erosion. Medium term: Minimal loss of agricultural land to erosion. Long term: Minimal loss of agricultural land to erosion.	No mitigation required
Water					
Water bodies include (but are not limited) to the following): <ul style="list-style-type: none"> Scurdie Ness to Deils Head Coastal Water Body (ID 200078) Montrose bedrock and localised sand and gravel aquifers Ground Water Body (ID 150267) 	<ul style="list-style-type: none"> All estuaries, coastal waters and where relevant rivers, lakes 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 under the EU WFD	0	Short term: Natural processes of coastal water body (and any other water body) will not be constrained. Medium term: As above Long term: As above	No mitigation required
Landscape					
Cliffed headland and rock platform	<ul style="list-style-type: none"> Scurdie Ness to Boddin Point is one of two significant lengths of rocky shore within the SMP area. 	To enhance the aesthetic and landscape character of the coastline	+	Short term: Allowing natural processes to continue will maintain the landscape character.	No mitigation required

Policy Scenario Area 3: Scurdie Ness to Rickle Craig					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)		Mitigation Measures/Environmental Opportunities
Isolated shingle / sand beaches Small old fishing village of Usan	<ul style="list-style-type: none"> • Predominantly wave-cut rock platform and cliffs with a beach at Fishtown of Usan. • Usan, 5km south of Montrose, is a small beach area (70m x 20m wide) of coarse sand and shingle 			<p>Medium term: Allowing natural processes to continue will maintain the landscape character.</p> <p>Long term: Allowing natural processes to continue will maintain the landscape character overall. As sea levels rise, the rock platform may become submerged and pocket beaches may narrow, resulting in a change in landscape character.</p>	

Scenario Area 4 – Lunan Bay

Revised Management Units	Draft Preferred Scenario		
	0-20 yrs	20-50 yrs	50-100 yrs
MU 4/1 Lunan Bay	NAI	NAI	NAI
MU 4/2 Corbie Knowe	NAI	NAI	NAI

Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/ Environmental Opportunities	
Population and Human Health					
Some residential property and B&B behind dunes at Lunan	<ul style="list-style-type: none"> 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	0	<p>Short term/Medium term/Long term: Properties set back from flood risk area, no adverse impacts</p>	Some assets affected by flooding or erosion, could be relocated further inland.
Holiday chalets at Corbie Knowe	<ul style="list-style-type: none"> Small community of holiday homes located in the southern corner at Corbie Knowe 	To minimise coastal flooding and erosion risk and its impact on people, coastal land use and future development plans	--	<p>Short term: Existing defences will be maintained by property owners until they reach the end of their effective life, providing short term protection to properties. However, defences are unlikely to prevent damage to frontal property under storm events from the north-east.</p> <p>Medium term: Increased erosion risk to holiday homes following defence failure</p> <p>Long term: Loss of holiday homes to erosion.</p>	
Recreational activities	<ul style="list-style-type: none"> 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). 	<p>To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities</p> <p>To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management</p>	—	<p>Short term/Medium term: The Bay and dunes are likely to remain stable, minimal impact on recreational activities.</p> <p>Long term: 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 adverse impact on recreational activities.</p>	
Designated bathing beach	<ul style="list-style-type: none"> North Lunan Bay beach 	To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management	0	Short term/Medium term/Long term Natural processes will continue, therefore no adverse impacts.	
Material Assets and Infrastructure					
Minor access road and car park	<ul style="list-style-type: none"> Local roads provide access to settlements and some other locations along the coastline 	To minimise coastal flood and erosion risk to	0	Short term/Medium term/Long term No adverse impacts.	No mitigation required

Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/ Environmental Opportunities	
at Lunan		critical infrastructure and maintain critical services			
Historic Environment					
Black jack, Red Castle, Newbarns and Corbie Knowe	<ul style="list-style-type: none"> 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	0	Short term/Medium term/Long term: Heritage properties on higher ground, no adverse impacts. Continued erosion of anti-tank blocks at Lunan Water. However no impact beyond existing.	Where avoidance of the features from flooding or erosion is not possible mitigation may take the form of excavation and recording.
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	<ul style="list-style-type: none"> 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 support natural coastal processes To maintain and enhance nationally designated conservation sites and their interest features.	++	Short term/Medium term/Long term: Integrity of conservation interest features maintained.	No mitigation required
Fisheries					
Fishing	<ul style="list-style-type: none"> 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	0	Short term/Medium term/Long term: No adverse impacts	No mitigation required
Geology and Soils					
Mainly grade 3 agricultural land	<ul style="list-style-type: none"> 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	+	Short/Medium term: The beach / dune system will continue to provide a natural form of defence to the backing agricultural land. Long term: 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.	No mitigation required in short to medium term. No mitigation has been identified for losses of agricultural land in the long-term.
Water					
Water bodies include (but are not limited to) the following): <ul style="list-style-type: none"> Scurdie Ness to Deil s Head Coastal Water Body (ID 200078) Lunan Water River Water Body (5900) Montrose bedrock and 	<ul style="list-style-type: none"> All estuaries, coastal waters and where relevant rivers, lakes 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 under the EU WFD	+	Short term/Medium term/Long term: Natural processes of coastal water body (and any other water body) will not be constrained.	No mitigation required

Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/ Environmental Opportunities
localised sand and gravel aquifers Ground Water Body (ID 150267) <ul style="list-style-type: none"> Arbroath bedrock and localised sand and gravel aquifers Ground Water Body (ID 150265) 				
Beach & dune system	<ul style="list-style-type: none"> 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 and identify new areas for coastal habitat creation as natural flood defences	<p style="text-align: center;">+</p> <p>Short term: Continuation of natural processes along the majority of the Bay with maintenance of the beach and dune system as a natural defence. Potential for lowering of the beach in the far south in front of defences.</p> <p>Medium term: Continuation of natural processes, and return to a more natural system at Corbie Knowe once defences fail, enhancing the beach and dune system as a natural defence.</p> <p>Long term: Continuation of natural processes; increasing erosion of the frontal edge of the dunes as sea levels rise.</p>	
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.	<ul style="list-style-type: none"> The wide intertidal beach of Lunan Bay is an important landscape feature in this CPU. 	To enhance the aesthetic value and landscape character of the coastline.	<p style="text-align: center;">+</p> <p>Short term/Medium term/Long term: Allowing natural processes will maintain the landscape character.</p>	No mitigation required

Scenario Area 5 – Lang Craig to Whiting Ness

Revised Management Units	Draft Preferred Scenario		
	0-20 yrs	20-50 yrs	50-100 yrs
MU 5/1 Lang Craig to Whiting Ness	NAI	NAI	NAI

Policy Scenario Area 5: Lang Craig to Whiting Ness					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)		Mitigation Measures/ Environmental Opportunities
Population and Human Health					
Small residential development at Ethie Haven and Auchmithie	<ul style="list-style-type: none"> 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	0	Short term: No adverse impacts. Medium term: No adverse impacts. Long term: No adverse impacts.	Ongoing monitoring of the risk posed by isolated cliff falls should be undertaken.
Recreational activities	<ul style="list-style-type: none"> 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	-	Short term: Potential erosion risk to cliff top paths as a result of periodic cliff falls. Medium term: Potential erosion risk to cliff top paths as a result of periodic cliff falls Long term: Potential erosion risk to cliff top paths as a result of periodic cliff falls.	Localised maintenance/relocation of the footpath may need to be considered should sections of the path become at risk from isolated cliff falls
Recreational beach at Auchmithie	<ul style="list-style-type: none"> Shingle beach at Auchmithie 		0	Short term: No adverse impacts. Medium term: No adverse impacts. Long term: Potential for narrowing of the beach as sea levels rise.	
Material Assets and Infrastructure					
Minor access roads	<ul style="list-style-type: none"> 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	-	Short term: No adverse impacts to most roads as located away from the cliff edge. Potential erosion risk to access roads to Auchmithie and Ethie Haven, in the form of cliff falls. Medium term: No adverse impacts to most roads as located away from the cliff edge. Potential erosion risk to access roads to Auchmithie and Ethie Haven, in the form of cliff falls. Long term: No adverse impacts to most roads as located away from the	Ongoing monitoring of the risk posed by isolated cliff falls should be undertaken. Consideration may need to be given to relocating access roads further in land.

Policy Scenario Area 5: Lang Craig to Whiting Ness					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)		Mitigation Measures/ Environmental Opportunities
				cliff edge. Potential erosion risk to access roads to Auchmithie and Ethie Haven, in the form of cliff falls.	
Historic Environment					
Auchmithie Conservation Area	<ul style="list-style-type: none"> 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.	0	Short term: No adverse impacts on the Conservation Area Medium term: No adverse impacts on the Conservation Area Long term: No adverse impacts on the Conservation Area	The likely impacts of the preferred SMP policy option on the historic sites will be investigated further at a more local level with Historic Scotland. Where the avoidance of the features from erosion is not possible, mitigation likely be in the form of excavation and recording
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	<ul style="list-style-type: none"> 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	--	Short term: Potential erosion risk to those historic assets near the cliff edge, in the form of cliff falls. Medium term: Potential erosion risk to those historic assets near the cliff edge, in the form of cliff falls. Long term: 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	<ul style="list-style-type: none"> Coastal grassland, cliffs (rock-ledge plant communities), Bryophyte, and breeding birds (the largest breeding seabird colony in Tayside) Various invertebrates including Lepidoptera. Old Red Sandstone igneous Non-marine Devonian stratigraphy 	To support natural coastal processes To maintain and enhance nationally designated conservation sites and their interest features	++	Short term: Integrity of national conservation interest features maintained. Medium term: Integrity of national conservation interest features maintained. Long term: Integrity of national conservation interest features maintained.	No mitigation required
GCR Sites <ul style="list-style-type: none"> Whiting Ness GCR Black Rock to East Comb GCR 	<ul style="list-style-type: none"> 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 support natural coastal processes To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites	+	Short term: Integrity of local conservation interest features maintained. Medium term: Integrity of local conservation interest features maintained. Long term: Integrity of local conservation interest features maintained.	
RIGS	<ul style="list-style-type: none"> The area from Whiting Ness to Carlingheugh Bay, which has excellent educational potential 	To support natural coastal processes To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites	+	Short term: Integrity of local conservation interest features maintained. Medium term: Integrity of local conservation interest features maintained. Long term: Integrity of local conservation interest features maintained.	
Seaton Cliffs SWT Nature Reserve	<ul style="list-style-type: none"> Geodiversity value 	To support natural coastal processes To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites	+	Short term: Integrity of local conservation interest features maintained. Medium term: Integrity of local conservation interest features maintained. Long term: Integrity of local conservation interest features maintained.	

Policy Scenario Area 5: Lang Craig to Whiting Ness					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/ Environmental Opportunities	
Soils and Geology					
Mainly grade 3 agricultural land with small pockets of grade 2 land	<ul style="list-style-type: none"> 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 southern ends of the unit (Lang Craig and Whiting Ness) 	To minimise coastal flood and erosion risk to agricultural land	-	<p>Short term: Minimal loss of agricultural land to erosion.</p> <p>Medium term: Minimal loss of agricultural land to erosion.</p> <p>Long term: Minimal loss of agricultural land to erosion.</p>	<p>No mitigation has been identified for losses of agricultural land.</p> <p>Undertake consultation with key stakeholders and landowner to discuss options</p>
Water					
<p>Water bodies include (but are not limited to) the following:</p> <ul style="list-style-type: none"> Scurdie Ness to Deils Head Coastal Water Body (ID 200078) The Deils Head to Carnoustie Coastal Water Body (ID 200072) (very minor overlap only) Arbroath bedrock and localised sand and gravel aquifers Ground Water Body (ID 150265) 	<ul style="list-style-type: none"> All estuaries, coastal waters and where relevant rivers, lakes 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 under the EU WFD	0	<p>Short term: Natural processes of coastal water bodies (or any other water body) will not be constrained.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	No mitigation required
Landscape					
<p>Old Red Sandstone cliffs and rocky shore</p> <p>Sea stacks, blowholes, caves, wave cut platforms and arches, all contribute to the outstanding and unique landscape</p> <p>Auchmithie village and derelict Harbour</p>	<ul style="list-style-type: none"> The stretch of sea cliffs and rocky shore is an important landscape feature in this CPU. 	To enhance the aesthetic and landscape character of the coastline.	+	<p>Short term: Allowing natural processes to continue will maintain the landscape character.</p> <p>Medium term: Allowing natural processes to continue will maintain the landscape character.</p> <p>Long term: Allowing natural processes to continue will maintain the landscape quality.</p>	No mitigation required

Scenario Area 6 – Arbroath to West Haven

Revised Management Units	Draft Preferred Scenario		
	20-50 yrs	20-50 yr	20-50 yrs
MU 6/1 (a) Victoria Park	HTL	HTL	HTL
MU 6/1 (b) Seagate	HTL	HTL	HTL
MU 6/2 Arbroath Harbour	HTL	HTL	HTL
MU 6/3 Inchcape Park to Westway Road	HTL	HTL	HTL
MU 6/4 (a) West Links to East Haven	HTL	HTL	HTL
MU 6/4 (b) East Haven	NAI	NAI	NAI
MU 6/4 (c) East Haven to West haven	NAI	NAI	NAI

Policy Scenario Area 6: Arbroath to West Haven				
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/ Environmental Opportunities
Population and Human Health				
Residential settlements - Arbroath	<ul style="list-style-type: none"> 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	<div style="background-color: #28a745; color: white; text-align: center; padding: 5px;">++</div> <p>Short term: Continued flood and erosion protection to Arbroath (including Victoria Park and Seagate). Medium term: As above Long term: As above</p>	Where there is a risk of flooding at East Haven undertake consultation with key stakeholders and private owners in developing an adaption plan to ensure an acceptable approach is developed.
East Haven village	<ul style="list-style-type: none"> Small residential settlement to the south-west of Arbroath with properties located between the coastline and the railway Located in a small bay, created by a gap in the rock platform 	To minimise coastal flooding and erosion risk and its impact on people, coastal land use and future development plans	<div style="background-color: #fd7e14; color: white; text-align: center; padding: 5px;">--</div> <p>Short term: Minimal risk of flooding to shoreline properties at East Haven Medium term: Increasing risk of flooding to shoreline properties at East Haven Long term: Potential for increased frequency of flooding to shoreline properties at East Haven</p>	
Small industry, harbour facilities	<ul style="list-style-type: none"> 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 	To minimise the impact of policies on marine operations and activities	<div style="background-color: #6c757d; color: white; text-align: center; padding: 5px;">+</div> <p>Short term: Continued protection of the harbour area and existing commercial assets.</p>	

Policy Scenario Area 6: Arbroath to West Haven					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/ Environmental Opportunities	
	<p>registered to the harbour, who land their catch at ports further north.</p> <ul style="list-style-type: none"> Arbroath Harbour operates a commercial slipway utilised by a wide range of vessels for refitting etc 			<p>Medium term: As above</p> <p>Long term: As above</p>	
Designated bathing waters and beach	<ul style="list-style-type: none"> “Excellent” rated EC Designated Bathing Water results at Arbroath West Links. Recreational beach at West Links Substantial improvement in water quality at Arbroath bathing water since the 1990s is linked to the pumping of local sewage to Hatton Sewage Treatment Works (STW) 	<p>To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities</p> <p>To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management</p>	0	<p>Short term: Some lowering of the beach in front of the defences at Inchcape. No impacts on the designated bathing and recreational beach at West Links.</p> <p>Medium term: Lowering of the beach at Inchcape will continue. No impacts on the designated bathing and recreational beach at West Links.</p> <p>Long term: Further narrowing and potential loss of the beach at Inchcape is likely due to coastal squeeze. No impacts on the designated bathing and recreational beach at West Links.</p>	
Recreational assets	<ul style="list-style-type: none"> 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) 	<p>To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities</p> <p>To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management</p>	+	<p>Short term: Continued flood and erosion protection to recreational assets such as Victoria Park and Arbroath FC. However, potential flood or erosion risk to the coastal walk between East Haven and West Haven. No risk to Arbroath Golf Course.</p> <p>Medium term: As above –parts of the coastal path between East Haven and West Haven may need to be relocated inland</p> <p>Long term: As above</p>	
Material Assets and Infrastructure					
Access to Arbroath Harbour	<ul style="list-style-type: none"> 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	+	<p>Short term: Ongoing maintenance of harbour structures will maintain operation of harbour and access road.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	No mitigation required.
Sewage outfall (CSO)	<ul style="list-style-type: none"> Victoria Park, Arbroath Queens Drive, Arbroath West Links, Arbroath 	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	+	<p>Short term: Continued protection to outfalls and associated services.</p> <p>Medium term: As above.</p> <p>Long term: As above.</p>	
A92 & minor access roads	<ul style="list-style-type: none"> 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	0	<p>Short term: No adverse impacts.</p> <p>Medium term: As above.</p> <p>Long term: As above.</p>	
Main East Coast Railway	<ul style="list-style-type: none"> 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	0	<p>Short term: Potential for localised hold the line at the railway line at Hatton.</p>	

Policy Scenario Area 6: Arbroath to West Haven					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)		Mitigation Measures/ Environmental Opportunities
				Medium term: As above Long term: As above	
Sewage pumping station, long sea outfall and pipe line	<ul style="list-style-type: none"> Elliott outfall 	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	0	Short term: Defences remain, no impacts Medium term: As above Long term: As above	
Historic Environment					
St Ninians Well, Arbroath Harbour, Old Arbroath Harbour, Signal Tower Museum	<ul style="list-style-type: none"> 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 contains many burial grounds 	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.	++	Short term: Continued flood protection of historic assets in Arbroath. Medium term: As above Long term: As above	No mitigation required
Arbroath Town Conservation Area	<ul style="list-style-type: none"> 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.	+	Short term: Continued flood protection of heritage assets in Arbroath Town Conservation Area. Medium term: As above Long term: As above	
Oldest recorded fishing village in Scotland	<ul style="list-style-type: none"> 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. 	<p>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.</p> <p>To minimise the impact of policies on marine operations and activities.</p>	+	Short term: Continued flood protection of harbour infrastructure. Medium term: As above Long term: As above	
Flora, fauna and biodiversity					
Elliot Links SSSI	<ul style="list-style-type: none"> Stable sand dune system Abandoned river meanders, which support important open dune and fen plant communities and invertebrates. 	<p>To support natural coastal processes</p> <p>To maintain and enhance nationally designated conservation sites and their interest features</p>	0	Short term: Localised holding the line at Elliot has the potential to constrain the natural evolution of the sand dunes along two short stretches, therefore no significant effect expected on the SSSI. No change to the existing freshwater habitats and species. Medium term: As above Long term: As above	No mitigation required.
East Haven SSSI	<ul style="list-style-type: none"> Greater Yellow Rattle Sand dune habitats 	<p>To support natural coastal processes</p> <p>To maintain and enhance nationally designated conservation sites and their interest features</p>		Short term: Likely to be beneficial to national conservation site as dunes (which may support Greater Yellow Rattle) are allowed to evolve and roll-back naturally. Medium term: Likely to be beneficial to national conservation site as	

Policy Scenario Area 6: Arbroath to West Haven					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)		Mitigation Measures/ Environmental Opportunities
			++	dunes are allowed to evolve and roll-back naturally. Long term: As above	
Fisheries					
Commercial Fishing and Sea angling	<ul style="list-style-type: none"> 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	+	Short term: Protection of harbour infrastructure. Unlikely to be any strategic impacts on fishing activity. Medium term: No adverse impacts in the medium term unless there are significant changes in water quality. Long term: As above	No mitigation required.
Soils and Geology					
Agricultural land	<ul style="list-style-type: none"> 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.	+	Short term: 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 in areas of no active intervention. Medium term: As above Long term: As above	No mitigation required.
Water					
Shingle / sand beaches	<ul style="list-style-type: none"> An extensive marine abrasion platform backed by several storm beaches consisting of boulders and shingle runs along almost the entire 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 	To maintain and enhance features as a natural flood defence and identify new areas for coastal habitat creation as natural flood defences	-	Short term: Where defences remain, beaches may narrow in front of defences, reducing their function of a natural defence. West of Arbroath, the beach at the dune toe will continue to provide natural protection to this stable frontage. Medium term: As above Long term: As above.	No mitigation provided for the narrowing of beaches as it is considered that this will be offset by areas of accretion.
Low frontal dune system from Elliot to Corse Hill	<ul style="list-style-type: none"> 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. 		+	Short term: A continuation of natural processes will mean no adverse effects on the stable dune system. However, some localised defence maintenance will constrain the natural roll-back of the dune system in two short locations. Medium term: As above Long term: As above. Erosion may increase as sea levels rise.	
Rock platform with sand beach and frontal dunes from Corse Hill to West Haven	<ul style="list-style-type: none"> An extensive marine abrasion platform fringed by a narrow strip of sand, runs along the northern extent. 		+	Short term: The fringing rock platforms will continue to provide protection to the shore. Medium term: The fringing rock platforms will continue to provide	

Policy Scenario Area 6: Arbroath to West Haven				
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/ Environmental Opportunities
			<p>protection to the shore, however, with sea levels rise the influence of the platform may reduce as it becomes submerged</p> <p>Long term: Permanent submergence of fringing rock platforms is possible as sea levels rise, reducing their natural defence function.</p>	
<p>Water bodies include (but are not limited to) the following:</p> <ul style="list-style-type: none"> • The Deils Head to Carnoustie Coastal Water Body (ID 200072) • Brothock Valley Sand and Gravel Ground Water Body (ID 150272) • Carnoustie bedrock and localised sand and gravel aquifers Ground Water Body (ID 150257) • Elliot Water River Water Body (ID 5950) 	<ul style="list-style-type: none"> • All estuaries, coastal waters and where relevant rivers, lakes 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 under the EU WFD	<p>0</p> <p>Short term: Natural processes of coastal water body (or any other water body) unlikely to be constrained to any significant extent, but depends on rate of sea level rise.</p> <p>Medium term: As sea levels rise with climate change, some loss of intertidal habitats along the frontage from Victoria Park to the harbour and from the harbour to Westway Road may result in deleterious effects on ecological status along a notable proportion (c.15%) of the coastal water body's shoreline. Further south, natural processes will be unconstrained.</p> <p>Long term: As above</p>	
Landscape				
<p>Arbroath Harbour and Victoria Park</p> <p>West Links and Elliot dune systems</p> <p>East Haven village</p>	<ul style="list-style-type: none"> • These features are important features contributing to the local landscape character. 	To enhance the aesthetic value and landscape character of the coastline	<p>+</p> <p>Short term: Allowing natural processes will maintain the landscape character to the south. In the north, where defences will continue to be maintained, there will be no change to the urban landscape.</p> <p>Medium term: As above</p> <p>Long term: Allowing natural processes will maintain the landscape character to the south, however, potential changes in landscape character at East Haven if erosion becomes an issue in the long term.</p>	No mitigation required

Scenario Area 7 – Carnoustie

Revised Management Units	Draft Preferred Scenario		
	0-20 yrs	20 -50 yrs	50-100 yrs
MU 7/1 West Haven to Carnoustie Station	HTL	HTL	HTL
MU 7/2 Carnoustie Station to Barry Burn	HTL	HTL	HTL

Policy Scenario Area 7: Carnoustie				
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities
Population and Human health				
Residential	<ul style="list-style-type: none"> The land use at West Haven is residential. 	To minimise coastal flooding and erosion risk and its impact on people, coastal land use and future development plans	++	<p>Short term: Continued flood protection to Carnoustie and West Haven.</p> <p>Medium term: As above</p> <p>Long term: As above</p>
Recreational assets	<ul style="list-style-type: none"> 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. 	<p>To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities</p> <p>To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management</p>	+	<p>Short term: Continued flood and erosion protection to recreational assets to maintain tourism and amenity areas.</p> <p>Medium term: As above</p> <p>Long term: As above</p>

Policy Scenario Area 7: Carnoustie					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities	
Designated bathing beach	<ul style="list-style-type: none"> The beach at Carnoustie has been identified as a designated bathing beach for purposes of EC Bathing Waters Directive Children's play area, paddling pool and car park facilities 	<p>To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities</p> <p>To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management</p>	<p>--</p>	<p>Short term: The fronting beach may narrow and lower due to the reflective nature of the defences and coastal squeeze against the defences over time with loss of amenity value.</p> <p>Medium term: The intertidal beach will continue to narrow and lower seaward of the remaining structures as sea levels rise, with associated loss of amenity value of the beach.</p> <p>Long term: As above</p>	
Carnoustie Championship Golf Links	<ul style="list-style-type: none"> The Championship Medal Course 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. 	<p>To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities</p> <p>To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management</p>	<p>+</p>	<p>Short term: Continued protection of Championship Golf Courses</p> <p>Medium term: As above</p> <p>Long term: As above</p>	
Material Assets and Infrastructure					
Main East Coast Railway	<ul style="list-style-type: none"> Runs through Carnoustie in the northern section of this unit 	<p>To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services</p>	<p>+</p>	<p>Short term: Continued flood and erosion protection of main east coast railway in Carnoustie.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	No mitigation required
Pumping station, sewage outfall and pipeline	<ul style="list-style-type: none"> Ballasters Park, West Haven CSO (Combined storm outfall) Pumping station is located and protected by a mixed rock/rubble revetment 	<p>To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services.</p>	<p>+</p>	<p>Short term: Continued protection of pumping station and associated assets from erosion.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	
Flora, fauna and biodiversity					
Part of Firth of Tay and Eden Estuary SPA (to the south of this MU)	<ul style="list-style-type: none"> Supports internationally important numbers of non-breeding waterfowl and aggregations of non-breeding bird 	<p>To support natural coastal processes</p> <p>To maintain and enhance the integrity of internationally/European designated nature conservation sites and the favourable condition of their interest features</p>	<p>-</p>	<p>Short term: No direct impacts on the site are anticipated. Potential for indirect impacts as the continued maintenance of defences to the north of the designated site may constrain natural processes affecting sediment supply to the designated site. Coastal squeeze of intertidal habitat adjacent to the designated site may potentially impact on SPA birds using the area. However, assuming the current sediment regime continues, this is not anticipated to affect the condition of the site as it is not currently affecting the site.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	Ongoing monitoring of erosion / accretion and consideration of changes in potential indirect impacts on designated sites.

Policy Scenario Area 7: Carnoustie				
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities
Part of Firth of Tay and Eden Estuary Special Area of Conservation (SAC) (to the south of this MU)	<ul style="list-style-type: none"> Coastal dune heathland Shifting dunes Dune grassland Humid dune slacks Shifting dunes with marram 	<p>To support natural coastal processes</p> <p>To maintain and enhance the integrity of internationally/European designated nature conservation sites and the favourable condition of their interest features</p>	-	<p>Short term: No direct impacts on the site are anticipated. Potential for indirect impacts as the continued maintenance of defences to the north of the designated site may constrain natural processes affecting sediment supply to the SAC dune habitat. However, assuming the current sediment regime continues, this is not anticipated to affect the status of the site as it is not currently affecting the site and the dune system will remain stable.</p> <p>Medium term: As above</p> <p>Long term: As above.</p>
Barry Links Site of Special Scientific Interest (SSSI) to the south of this MU	<ul style="list-style-type: none"> SSSI for its dune habitats and landforms, vascular plants, bryophytes, invertebrates and breeding birds 	<p>To support natural coastal processes</p> <p>To maintain and enhance nationally designated conservation sites and their interest features</p>	-	<p>Short term: No direct impacts on the site are anticipated. Potential for indirect impacts as the continued maintenance of defences to the north of the designated site may constrain natural processes affecting sediment supply to the site. Coastal squeeze of intertidal habitat adjacent to the designated site may potentially impact on species using the area. However, assuming the current sediment regime continues, this is not anticipated to affect the condition of the site as it is not currently affecting the site and the dune system will remain stable.</p> <p>Medium term: As above</p> <p>Long term: As above.</p>
Water				
Beach and dunes	<ul style="list-style-type: none"> 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 sea or blown inland. 	To maintain and enhance features as a natural flood defence and identify new areas for coastal habitat creation as natural flood defences	+	<p>Short term: 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.</p> <p>Medium term: The dunes will remain relatively stable. The intertidal beach will continue to narrow and lower seaward of the remaining structures as sea levels rise.</p> <p>Long term: As above</p>

Policy Scenario Area 7: Carnoustie					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities	
<p>Water bodies include (but are not limited to) the following:</p> <ul style="list-style-type: none"> The Deils Head to Carnoustie Coastal Water Body (ID 200072) (very minor overlap only) Carnoustie to Fife Ness Coastal Water Body (ID 200069) Carnoustie bedrock and localised sand and gravel aquifers Ground Water Body (ID 150257) 	<ul style="list-style-type: none"> All estuaries, coastal waters and where relevant rivers, lakes 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 under the EU WFD	<p style="text-align: center; font-size: 2em;">0</p>	<p>Short term: Natural processes of coastal water body (or any other water body) unlikely to be constrained to any significant extent, but depends on rate of sea level rise.</p> <p>Medium term: As sea levels rise with climate change, some loss of intertidal habitats is likely along the frontage. The frontage is small compared to the full coastline of the water body, and also is likely to be a non-critical reach in terms of ecological quality. WFD objectives are unlikely to be compromised</p> <p>Long term: As above</p>	
Landscape					
<p>Carnoustie beach, shore platform and backing dunes</p> <p>Golf Course and infrastructure</p> <p>Dune systems at Buddon Ness</p>	<ul style="list-style-type: none"> Carnoustie Beach is an important feature in the landscape of this CPU 	To enhance the aesthetic value and landscape character of the coastline.	<p style="text-align: center; font-size: 2em;">+</p>	<p>Short term: Defences will maintain the existing landscape character of land in the hinterland. The narrowing of the beach may affect the local landscape character but no adverse strategic landscape impacts would be experienced.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	No mitigation required

Scenario Area 8 – Buddon Ness

Revised Management Units	Draft Preferred Scenario		
	0-20 yrs	20-50 yrs	50-100 yrs
MU 8/1 Barry Sands East	HTL	HTL	HTL
MU 8/2 Barry Buddon & Barry Sands West	NAI	NAI	NAI

Policy Scenario Area 8: Buddon Ness					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities	
Population and human health					
Material Assets and Infrastructure					
MoD Barry Buddon Training Camp	<ul style="list-style-type: none"> The Camp and training ground occupy the entire Barry Buddon peninsula and is owned by the Ministry of Defence (MoD). There are six 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.	+	<p>Short term: Continued evolution of dune system, with fluctuating erosion and accretion along Buddon Ness, but no adverse impacts on training camp.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	Where there is potential flood risk to some minor roads undertake consultation with key stakeholders in developing an adaption plan to ensure an acceptable approach is developed.
Barry Sands East – MoD Exclusion area	<ul style="list-style-type: none"> 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.	+	<p>Short term: Continued protection of exclusion area and rifle ranges.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	
Access to Port of Dundee	<ul style="list-style-type: none"> Access to port to be maintained 	To minimise the impact of policies on marine operations and activities	0	<p>Short term: No adverse impacts</p> <p>Medium term: No adverse impacts</p> <p>Long term: No adverse impacts</p>	
Minor access roads and facilities associated with Camp	<ul style="list-style-type: none"> Local tracks on Buddon Ness to training facilities 	To minimise coastal flood and erosion risk to critical infrastructure and maintain critical services	+	<p>Short term: Continued protection of access tracks.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	

Policy Scenario Area 8: Buddon Ness					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities	
Minor roads	<ul style="list-style-type: none"> 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	-	<p>Short term: Potential flood risk to some minor roads.</p> <p>Medium term: Potential flood risk to some minor roads increases with sea level rise.</p> <p>Long term: Potential flood risk to some minor roads will continue to increase with increased sea level rise.</p>	
Historic Environment					
Buddon Ness: Old High Lighthouse, Low Lighthouse and ice house	<ul style="list-style-type: none"> 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	-	<p>Short term: Potential flood risk to Low Lighthouse</p> <p>Medium term: Increased flood risk to Low Lighthouse</p> <p>Long term: Increased frequency of flood risk to Low Lighthouse</p>	Where there is potential flood risk to the low lighthouse, undertake consultation with key stakeholders in developing an adaption plan to ensure an acceptable approach is developed.
Barry Military Links: Barry Camp and Buddon Camp	<ul style="list-style-type: none"> 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	+	<p>Short term: Continued evolution of dune system, with fluctuating erosion and accretion along Buddon Ness, but no adverse impacts on the historic links.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	
Flora, fauna and biodiversity					
Barry Links SAC	<ul style="list-style-type: none"> Fixed dunes Embryonic shifting dunes Grey dunes Humid dune slacks Shifting dunes 	<p>To support natural coastal processes</p> <p>To maintain and enhance the integrity of internationally designated nature conservation sites and the favourable condition of their interest features</p>	--	<p>Short term: NAI along much of the boundary of this site will allow natural processes to operate and is likely to be beneficial to the SAC. However the continued maintenance of defences in the north-eastern part of the designated site will constrain natural processes and has potential to exacerbate dune erosion to a small part of MU8/2 through cut-back immediately to the southern end of the defences. However, overall it is not anticipated that the dunes will be affected assuming current conditions continue with sediment accreting in this management unit</p> <p>Medium term: As above</p> <p>Long term: As above</p> <p>Potential significant effect – HRA required</p>	<p>Strategic level monitoring will be undertaken to better understand any geomorphological changes along the coastline, which will include review and appropriate intervention if require when agreed trigger levels are reached/early warning system.</p> <p>Habitat losses and gains will be quantified at the strategy level.</p>
Part of Firth of Tay and Eden Estuary SAC	<ul style="list-style-type: none"> Estuaries Mudflats and sandflats Sandbanks Harbour seal 	<p>To support natural coastal processes</p> <p>To maintain and enhance the integrity of internationally/European designated nature conservation sites and the favourable condition of their interest features</p>	--	<p>Short term: NAI along much of the boundary of this site will allow natural processes to operate and is likely to be beneficial to the SAC. However the continued maintenance of defences in the north-eastern part of the designated site may result in coastal squeeze of the intertidal habitat. However, no reduction in the habitats are anticipated as the structures are already in place and are not currently impacting on the site's condition and the current conditions of erosion and accretions are</p>	<p>Sensitive design and mitigation during works (e.g. avoid seal breeding season, little tern nesting areas, routing of construction traffic to avoid the loss of sensitive habitats used by</p>

Policy Scenario Area 8: Buddon Ness				
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities
			<p>expected to continue.</p> <p>Medium term: As above</p> <p>Long term: As above</p> <p>Potential significant effect – HRA required</p>	the qualifying species).
Part of Firth of Tay and Eden Estuary SPA and Ramsar site	<ul style="list-style-type: none"> Supports internationally important numbers of non-breeding waterfowl and aggregations of non-breeding birds 	<p>To support natural coastal processes</p> <p>To maintain and enhance the integrity of internationally/European designated nature conservation sites and the favourable condition of their interest features</p>	<p>--</p> <p>Short term: NAI along much of the boundary of this site will allow natural processes to operate and is likely to be beneficial to the SPA and Ramsar site. However the continued maintenance of defences in the north-eastern part of the designated site may result in coastal squeeze of the intertidal habitat supporting designated bird species. However, no reduction in the habitats are anticipated as the structures are already in place and are not currently impacting on the site's condition and the current conditions of erosion and accretions are expected to continue.</p> <p>Medium term: As above</p> <p>Long term: As above</p> <p>Potential significant effect – HRA required</p>	
West part of Barry Buddon SSSI	<ul style="list-style-type: none"> Barry Links is an SSSI for its dune habitats and landforms, vascular plants, bryophytes, invertebrates and breeding birds. 	<p>To support natural coastal processes</p> <p>To maintain and enhance nationally designated conservation sites and their interest features</p>	<p>--</p> <p>Short term: NAI along much of the boundary of this site will allow natural processes to operate and is likely to be beneficial to the dune habitats and qualifying interest species of the SSSI. However the continued maintenance of defences in the north-eastern part of the designated site may result in coastal squeeze of the intertidal habitat supporting designated bird species. However, no reduction in the habitats are anticipated as the structures are already in place and are not currently impacting on the site's condition and the current conditions of erosion and accretions are expected to continue.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	
Barry Links GCR	<ul style="list-style-type: none"> 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. 	<p>To support natural coastal processes</p> <p>To avoid adverse impacts on, conserve and enhance the designated interest of local conservation sites</p>	<p>-</p> <p>Short term: Holding the line at Barry Links East will prevent the natural roll-back of the dune habitats and is likely to be detrimental to the GCR.</p> <p>Further south, the dune habitats will be allowed to migrate landward naturally in response to sea level rise although there may be some erosion of the dune face and breaching of the dunes from storm surges.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	Strategic level monitoring will be undertaken to better understand any geomorphological changes along the coastline, which will include review and appropriate intervention if require when agreed trigger levels are reached/early warning system.

Policy Scenario Area 8: Buddon Ness					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities	
Water					
Sand beach and dunes	<ul style="list-style-type: none"> Open coast and Ness system is one of the largest sites on the East coast of Scotland (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 and identify new areas for coastal habitat creation as natural flood defences	-	<p>Short term: Where defences are maintained at Barry Sands East, beaches may narrow in front of defences, reducing their function of a natural defence. Beaches and dune system at Buddon Ness will continue to provide natural protection to this stable frontage.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	No mitigation provided for the narrowing of beaches as it is considered that this will be offset by areas of accretion.
Water bodies include (but are not limited to the following): <ul style="list-style-type: none"> Carnoustie to Fife Ness Coastal Water Body (ID 200069) Lower Tay Estuary Transitional Water Body (ID 200438) Carnoustie bedrock and localised sand and gravel aquifers Ground Water Body (ID 150257) 	<ul style="list-style-type: none"> All estuaries, coastal waters and where relevant rivers, lakes 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 under the EU WFD		<p>Short term: Natural processes of transitional water body will continue along Barry Sands West frontage, which is considered beneficial. However, holding the line at Barry Sands East will perpetuate the disconnection of the beach/dune system and also the absence of a sandy beach. As these impacts are in a large waterbody, the impacts are not considered significant.</p> <p>Medium term: Whilst natural processes will continue in the transitional water body at Barry Sands West, as sea levels rise with climate change, some loss of intertidal habitats is likely along the coastal water body frontage at Barry Sands East. The frontage represents >10% of the water body's coastline and the loss of habitats may impact on ecological quality. Holding the line at Barry Sands East will perpetuate the disconnection of the beach/dune system and also the absence of a sandy beach. As these impacts are in a large waterbody, the impacts are not considered significant.</p> <p>Long term: No significant impact on waterbody under a NAI and HTL</p>	
Landscape					
Barry sands west, a continuation of the beach at Buddon Ness Monifieth Bay	<ul style="list-style-type: none"> Barry Sands and Monifieth Bay are important elements contributing to the landscape character of this CPU. 	To enhance the aesthetic value and landscape character of the coastline	-	<p>Short term: Allowing natural processes will maintain the landscape character at Buddon Ness. Holding the line at Barry Sands East will result in the continued narrowing of the beach and loss of the dunes with potential changes in landscape character. At Barry Sands East, the natural interaction between the beach and dune habitats will be prevented.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	Strategic level monitoring will be undertaken to better understand any geomorphological changes along the coastline

Scenario Area 9 – Monifieth to Broughty Ferry

Revised Management Units	Draft Preferred Scenario		
	0-20 yrs	20-50 yrs	50-100 yrs
MU 9/1 MoD Boundary to west Tayview Caravan Park	HTL	HTL	HTL
MU 9/2 Monifieth West	HTL	HTL	HTL
MU 9/3 Barnhill to the Esplanade	HTL	HTL	HTL
MU 9/4 Broughty Ferry East	HTL	HTL	HTL
MU 9/5 Broughty Ferry	HTL	HTL	HTL

Policy Scenario Area 9: Monifieth to Broughty Ferry					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities	
Population and human health					
Designated bathing beach	<ul style="list-style-type: none"> 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. 	<p>To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities</p> <p>To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management</p>	--	<p>Short term: Beaches will narrow in front of defences, reducing the amenity value of the beach, however, accretion in front of some defences at Monifieth playing fields and at Broughty Ferry is expected to continue.</p> <p>Medium term: Beaches will 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.</p> <p>Long term: Continued maintenance and upgrading of the existing defences will restrict movement, beaches will narrow and dune erosion will increase, reducing amenity value. Potential loss of beach access points.</p>	The coastal footpath may be need to be relocated landward in some locations between Monifieth and Broughty Ferry. There are opportunities to improve recreational assess, features and aesthetics of existing defence in this management unit.
Informal recreational assets	<ul style="list-style-type: none"> 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 	<p>To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities</p> <p>To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor</p>		<p>Short term: Continued flood and erosion protection of most informal recreational assets</p> <p>Medium term: Continued flood and erosion protection of most informal recreational assets although</p>	

Policy Scenario Area 9: Monifieth to Broughty Ferry					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities	
	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	management	+	Long term: As above	
Monifieth Seafront Recreation Area (putting green, tennis courts, football pitches)	<ul style="list-style-type: none"> Includes a skate park, play areas for toddlers and teenagers, putting, lookout tower, path network, improved toilet facilities, increased parking and traffic calming. 	<p>To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities</p> <p>To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management</p>	+	<p>Short term: Continued flood and erosion protection of Monifieth Seafront recreational assets.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	
Broughty Ferry Castle, putting green, pavilion	<ul style="list-style-type: none"> Broughty Ferry links offer several leisure facilities including tennis courts and putting. 	<p>To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities</p> <p>To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management</p>	+	<p>Short term: Continued flood and erosion protection of Broughty Ferry Castle.</p> <p>Medium term: As above</p> <p>Long term: As above.</p>	
Caravan parks	<ul style="list-style-type: none"> 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. 	<p>To minimise coastal flooding and erosion risk to key recreation and tourism assets and activities</p> <p>To enhance the tourism value of the coast and aim to incorporate and improve recreation, tourism and visitor management</p>	+	<p>Short term: Continued flood and erosion protection to Caravan Parks.</p> <p>Medium term: As above</p> <p>Long term: As above.</p>	
Historic landfill site at Monifieth and Broughty Ferry	<ul style="list-style-type: none"> The recreational facilities at Monifieth Bay have been constructed on an existing landfill site, which was in operation between 1920 and 1930. The dune slacks at Monifieth Bay were also used as landfill sites and capped with soil. 	To minimise coastal flooding and erosion risk and its impact on people, coastal land use and future development plans.	+	<p>Short term: Continued flood and erosion protection to the historic landfill area.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	
Material Assets and Infrastructure					
Access to Port of Dundee	<ul style="list-style-type: none"> Access to port to be maintained 	To minimise the impact of policies on marine operations and activities	0	<p>Short term: No adverse impacts</p> <p>Medium term: No adverse impacts</p> <p>Long term: No adverse impacts</p>	
Water main, sewage outfalls and pipelines	<ul style="list-style-type: none"> 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	+	<p>Short term: Continued flood and erosion protection to service infrastructure.</p> <p>Medium term: As above</p> <p>Long term: As above.</p>	

Policy Scenario Area 9: Monifieth to Broughty Ferry					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities	
Minor roads	<ul style="list-style-type: none"> 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	+	Short term: Continued flood protection to minor roads. Medium term: As above Long term: As above.	
Main East Coast Railway	<ul style="list-style-type: none"> 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	+	Short term: Continued erosion protection to Main East Coast Railway. Medium term: As above Long term: As above.	
Historic Environment					
Broughty Ferry Conservation Area	<ul style="list-style-type: none"> 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.	+	Short term: Continued flood protection of architectural and historic assets in the Conservation Area. Medium term: As above Long term: As above.	No mitigation required
Broughty Castle	<ul style="list-style-type: none"> 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.	++	Short term: Continued flood and erosion protection of Broughty Ferry Castle. Medium term: As above Long term: As above.	
Flora, fauna and biodiversity					
Part of Firth of Tay and Eden Estuary SAC	<ul style="list-style-type: none"> Estuaries Intertidal mudflats and sandflats Sandbanks Harbour seal 	<p>To support natural coastal processes</p> <p>To maintain and enhance the integrity of internationally designated nature conservation sites and the favourable condition of their interest features</p>	--	Short term: The continued maintenance of defences may result in coastal squeeze of the intertidal habitat. However, no reduction in the habitats are anticipated as the management already in place that is not currently impacting on the site's condition will remain and the current conditions of erosion and accretions are expected to continue. Medium term: As above Long term: As above Potential significant effect – HRA required	<p>Strategic level monitoring will be undertaken to better understand any geomorphological changes along the coastline, which will include review and appropriate intervention if require when agreed trigger levels are reached/early warning system.</p> <p>Sensitive design and mitigation during works (e.g. avoid seal breeding season, little tern nesting areas, routing of construction traffic to avoid the loss of sensitive habitats used by the qualifying species).</p>
Part of Firth of Tay and Eden Estuary SPA and Ramsar site	<ul style="list-style-type: none"> Supports internationally important numbers of non-breeding waterfowl and aggregations of non-breeding birds 	<p>To support natural coastal processes</p> <p>To maintain and enhance the integrity of internationally designated nature conservation sites and the favourable condition of their interest features</p>	--	Short term: The continued maintenance of defences may result in coastal squeeze of the intertidal habitat supporting designated birds. However, no reduction in the habitats are anticipated as the management already in place that is not currently impacting on the site's condition will remain and the current conditions of erosion and accretions are expected to continue.	

Policy Scenario Area 9: Monifieth to Broughty Ferry					
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities	
				<p>Medium term: As above</p> <p>Long term: As above</p> <p>Potential significant effect – HRA required</p>	
Monifieth Bay SSSI	<ul style="list-style-type: none"> Inter-tidal habitat and feeding area for internationally important numbers of wintering waders and ducks. 	<p>To support natural coastal processes</p> <p>To maintain and enhance nationally designated conservation sites and their interest features</p>	--	<p>Short term: The continued maintenance of defences may result in coastal squeeze of the intertidal habitat (including those supporting qualifying birds). However, no reduction in the habitats are anticipated as the management already in place that is not currently impacting on the site's condition will remain and the current conditions of erosion and accretions are expected to continue.</p> <p>Medium term: As above</p> <p>Long term: As above</p>	
Water					
Sand beach and dunes	<ul style="list-style-type: none"> 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. 	<p>To maintain and enhance features as a natural flood defence and identify new areas for coastal habitat creation as natural flood defences</p>	-	<p>Short term: 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.</p> <p>Medium term: As short term</p> <p>Long term: Defences will continue to restrict movement, beaches will narrow and dune erosion will increase.</p>	No mitigation provided for the narrowing of beaches as it is considered that this will be offset by areas of accretion.
<p>Water bodies include (but are not limited to) the following:</p> <ul style="list-style-type: none"> Lower Tay Estuary Transitional Water Body (ID 200438) Dighty Water River Water Body (ID 6001) Dundee bedrock and localised sand and gravel aquifers Ground Water Body (ID 150256) 	<ul style="list-style-type: none"> All estuaries, coastal waters and where relevant rivers, lakes 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. 	<p>To support the achievement of good ecological and chemical status under the EU WFD</p>	0	<p>Short term: Natural processes of transitional water body will not be constrained to any significant extent, but depends on rate of sea level rise</p> <p>Medium term: As sea levels rise with climate change, some loss of intertidal beach habitats is likely along approximately half of the transitional water body frontage (whilst accretion is expected to continue along the other half). This "squeezed" frontage represents approximately 5% of the water body's coastline, and although other reaches will have significantly higher ecological value to the water body as a whole, there may be some impact on ecological quality.</p> <p>Long term: As above plus dune loss is likely to accompany beach loss.</p>	
Landscape					
<p>Monifieth recreation ground and caravan parks</p> <p>The Dighty Water splits Monifieth Beach from the beach that runs west to Broughty Ferry.</p>	<ul style="list-style-type: none"> Barry Sands and Monifieth Bay are important elements contributing to the landscape character of this CPU. 	<p>To enhance the aesthetic value and landscape character of the coastline</p>	+	<p>Short term: Defence maintenance will maintain the existing landscape character of the frontage</p> <p>Medium term: Over time, the defences will result in the narrowing of the beach, which may change the local landscape character.</p> <p>Long term: As above</p>	No mitigation required

Policy Scenario Area 9: Monifieth to Broughty Ferry				
Location / Feature	Key Issues and Benefits	Relevant Objectives	Potential Impacts (include direct/indirect, secondary and cumulative)	Mitigation Measures/Environmental Opportunities
Links area at Broughty Ferry Broughty Ferry town and Castle fronted by a wide sandy beach				