Cynllun Gweithredu Thematig Natura 2000
Rheoli Perygl Llifogydd ac Erydu Arfordirol

Natura 2000 Thematic Action Plan
Flood and Coastal Erosion Risk Management

Rhaglen Natura 2000 LIFE yng Nghymru
LIFE Natura 2000 Programme for Wales

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October 2015

1. Cyflwyniad

Rhaglen Natura 2000 LIFE yng Nghymru

Mae 92 Ardal Cadwraeth Arbennig (ACA) ac 20 Ardal Gwarchodaeth Arbennig (AGA) Cymru'n cynnwys 123 o nodweddion cynefinoedd a rhywogaethau dynodedig. Gyda'i gilydd, y rhain yw rhwydwaith Natura 2000.

Mae Rhaglen Natura 2000 LIFE yng Nghymru wedi datblygu blaen-gynllyn strategol i reoli ac adfer Natura 2000 yng Nghymru. Drwy weithio â rhanddeiliaid mae wedi pennu'r prif heriau sy'n wynebu'r safleoedd, y rhywogaethau a'r cynefinoedd hyn a warchodir gan Ewrop, a nodi'r camau gweithredu sydd eu hangen, y blaenoriaethau, y costau a'r cyfleoedd cyllido i fynd i'r afael â nhw. Cafodd y rhaglen ei chynnal gan Cyfoeth Naturiol Cymru a'i hariannu gan gynllun LIFE+ Nature yr Undeb Ewropeaidd.

Y pwrpas yw galluogi Cymru i wneud cynnydd sylweddol tuag at sicrhau bod rhywogaethau a chynefinoedd Natura 2000 mewn cyflwr ffafriol a helpu i gyflawni ei hymrwymiadau o dan Gyfarwyddeb Cynefinoedd ac Adar yr Undeb Ewropeaidd. Mae'r Rhaglen yn ceisio darparu llwyfan hefyd i sicrhau rhagor o gyllid ar gyfer prosiectau sy'n gysylltiedig â Natura 2000 o bob ffynhonnell bosibl, ac i integreiddio cyllid Natura 2000 mewn offerynnau ariannol a meysydd polisi eraill.

Mae manylion llawn Rhaglen Natura 2000 LIFE a rhwydwaith Natura 2000 yng Nghymru yn *Ffeithiau a Ffigurau, Rhaglen Natura 2000 LIFE yng Nghymru: Adroddiad 1*.

Cynlluniau Gweithredu Thematig

Mae Rhaglen Natura 2000 LIFE wedi creu 11 Cynllun Gweithredu Thematig, pob un yn ymdrin â chamau gweithredu strategol blaenoriaeth i fynd i'r afael â'r prif broblemau a'r risgiau[1] a nodwyd fel y rhai sy'n cael effaith andwyol ar nodweddion Natura 2000 ledled y rhwydwaith.

Y Cynlluniau Gweithredu Thematig yw:

- Mynediad a hamdden
- Llygredd aer: Gwaddodi nitrogen
- Newid yn yr hinsawdd a chwalu cynefinoedd
- Llygredd dŵr gwasgaredig
- Rheoli perygl llifogydd ac erydu arfordirol
- Rheoli pori a da byw
- Rhywogaethau a phathogenau estron goresgynnol
- Newidiadau gan ddyn i amodau hydrolig
- Sbwriel y môr
- Pysgodfeydd morol
- Rheoli coetiroedd

[1] Problemau (neu bwysau) yw adweithiau andwyol i nodweddion Natura 2000 sy'n digwydd ar hyn o bryd ar neu yng nghyffiniau ACA neu AGA sy'n rhwystro'r rhywogaeth neu'r cynefin dynodedig rhag cyrraedd cyflwr ffafriol. Risgiau (neu fygythiadau) i nodweddion Natura 2000 sy'n debygol o ddigwydd erbyn 2020.

Y brif gynulleidfa ar gyfer y Cynlluniau Gweithredu yw rheolwr, pobl sy'n gwneud penderfyniadau a chyllidwyr yn Cyfoeth Naturiol Cymru, Llywodraeth Cymru a sefydliadau partner allweddol.

Mae'r camau gweithredu i'w gweld yn y tabl yn Adran 9. Camau yw'r rhain y gellir eu cyflawni ar lefel genedlaethol neu ranbarthol, i ategu camau gweithredu ar safleoedd o fewn Cynlluniau Gwella â Blaenoriaeth. Maent yn ceisio mynd i'r afael â rhwystrau sylfaenol, a'u hachosion lle bo'n bosibl, a datblygu fframwaith strwythurol sy'n cefnogi ac yn hyrwyddo trefniadau rheoli priodol yn lleol. Mae'r camau gweithredu'n cynnwys y rhai sydd eu hangen i fynd i'r afael â bylchau mewn tystiolaeth sy'n atal dealltwriaeth lawn o anghenion rheoli.

Gall rhai camau gweithredu strategol gynnig ffrydiau gwaith newydd a mentrau mawr; mae eraill yn cyd-fynd i raddau helaeth â pholisïau, strategaethau a rhaglenni gwaith sy'n bodoli eisoes neu sydd wrthi'n cael eu datblygu.

Cafodd y camau gweithredu strategol eu nodi yn ystod gweithdai a gynhaliwyd gyda gweithwyr proffesiynol arbenigol yn y maes, o Cyfoeth Naturiol Cymru a sefydliadau eraill. Roeddynt yn seiliedig hefyd ar grynodebau o gamau gweithredu ar safleoedd a oedd yn deillio o'r Cynlluniau Gwella â Blaenoriaeth a'r Gronfa Ddata Camau Gweithredu (gweler isod). Cafodd y rhain eu hadolygu a'u dilysu gan weithgor bychan a buont yn destun proses ymgysylltu a thrafod gyda rhanddeiliaid hefyd. Gweler Adran 7 am ragor o fanylion.

Y camau gweithredu strategol yw'r rhai a nodwyd sydd eu hangen i gael y nodweddion i gyflwr ffafriol. Maent yn amodol ar y graddau y mae adnoddau ar gael ac ar gytundeb rhanddeiliaid. Nid ydynt yn cynrychioli cynllun gweithredol sydd wedi'i ariannu'n llawn nac wedi ymrwymo'n llawn iddo. Fodd bynnag, y bwriad yw defnyddio'r camau gweithredu i lywio amrywiaeth o gynlluniau gweithredol a rhaglenni gwaith yn y dyfodol.

Er bod y camau gweithredu strategol yn canolbwyntio ar gyfres Natura 2000, gellir defnyddio llawer ohonynt yn eang a gallent fod o fudd i Safleoedd o Ddiddordeb Gwyddonol Arbennig a helpu i warchod bioamrywiaeth a chryfhau'r ecosystem yn yr amgylchedd ehangach.

Cynlluniau Gwella â Blaenoriaeth a Chronfa Ddata Camau Gweithredu

Mae Rhaglen Natura 2000 LIFE wedi cynhyrchu Cynlluniau Gwella â Blaenoriaeth ar gyfer pob safle Natura 2000 yng Nghymru. Mae'r cynlluniau hyn yn nodi'r prif broblemau a risgiau sy'n effeithio ar nodweddion Natura 2000 ac yn disgrifio'r camau gweithredu â blaenoriaeth, wedi'u costio, sydd eu hangen i gael a chynnal nodweddion y safle mewn cyflwr ffafriol. Mae'r cynlluniau'n defnyddio gwybodaeth o Gronfa Ddata Camau Gweithredu Cyfoeth Naturiol Cymru sy'n cynnwys yr holl gamau gweithredu (blaenoriaeth uchel, canolig, isel) ar gyfer safleoedd Natura 2000. Datblygwyd y camau gweithredu gan Swyddogion Cadwraeth Cyfoeth Naturiol Cymru ar y cyd â rhanddeiliaid a phartneriaid. Cafodd cynnwys y Gronfa Ddata ei ymestyn a'i ddiweddaru'n llawn yn ystod 2014/5.

2. Introduction

LIFE Natura 2000 Programme for Wales

There are 123 designated habitat and species features on the 92 Special Areas of Conservation (SACs) and 20 Special Protection Areas (SPAs) in Wales. Together these comprise the Natura 2000 network.

The LIFE Natura 2000 Programme for Wales has developed a strategic forward plan to manage and restore Natura 2000 in Wales. Working with stakeholders it has determined the key challenges facing these European protected sites, species and habitats and identified the actions required, priorities, costs and funding opportunities to address them. The Programme was run by Natural Resources Wales (NRW) and funded by the European Union scheme LIFE+ Nature.

The purpose is to enable Wales to make significant progress towards bringing Natura 2000 species and habitats into favourable condition and help meet its commitments under the European Habitats and Birds Directives. The Programme also aims to provide a platform to seek further funding for Natura 2000 related projects from all potential sources, and to integrate Natura 2000 funding into other financial instruments and policy areas.

Full details about the LIFE Natura 2000 Programme and the Natura 2000 network in Wales can be found in the *LIFE Natura 2000 Programme for Wales: Fact and Figures Report*.

Thematic Action Plans

The LIFE Natura 2000 Programme has created 11 Thematic Action Plans, each of which detail priority strategic actions to address major issues and risks[2] which have been identified as having an adverse impact on Natura 2000 features across the network.

The Thematic Action Plans are as follows:

- Access and recreation
- Air pollution: Nitrogen deposition
- Climate change and habitat fragmentation
- Diffuse water pollution
- Flood and coastal erosion risk management
- Grazing and livestock management
- Non-native invasive species and pathogens
- Man-made changes to hydraulic conditions
- Marine litter
- Marine fisheries
- Woodland management

[2] Issues (or pressures) are adverse impacts to Natura 2000 features which are currently taking place on or around SACs or SPAs which act as barriers to the designated habitat or species features reaching favourable condition. Risks (or threats) are impacts to Natura 2000 features which are likely to occur by 2020.

The primary audience for the Actions Plans are managers, decision makers and fund holders within Natural Resources Wales, the Welsh Government and key partner organisations.

The strategic actions are set out in the table in Section 9. These are actions which may be delivered at national or regional level, to complement the site-level actions within Prioritised Improvement Plans (PIPs). They seek to address fundamental barriers and where possible their root causes, and to develop a structural framework which supports and promotes appropriate management at a local level. Actions include those needed to address evidence gaps which are hindering full understanding of management needs. Some strategic actions may propose new work streams and larger-scale initiatives; others align closely to existing or developing policies, strategies and work programmes.

The strategic actions were identified during workshops held with professionals with expertise in the field, from Natural Resources Wales and other organisations. These were also informed by summaries of site level actions derived from the PIPs and Actions Database (see below). These were reviewed and validated by a small working group and also subject to a process of engagement and discussion with stakeholders. See Section 8 for more details.

The strategic actions are those which have been identified as being required to bring features into favourable condition. They are subject to resource availability and stakeholder agreement. They do not represent a fully funded or committed operational plan. However, the intention is that the actions will be used to inform a range of operational plans and work programmes in the future.

While the strategic actions are focused on the Natura 2000 series, many have a broad applicability and may also be of benefit to Sites of Special Scientific Interest and other biodiversity conservation and ecosystem resilience work in the wider environment.

Prioritised Improvement Plans and Actions Database

The LIFE Natura 2000 Programme has produced Prioritised Improvement Plans (PIPs) for all Natura 2000 sites in Wales. The PIPs identify the main issues and risks affecting the Natura 2000 features on the site and describe costed, prioritised actions required to achieve and maintain the site features in favourable condition.

The PIPs draw information from the Natural Resources Wales Actions Database which hold all actions (high, medium, low priority) for Natura 2000 sites. Actions were developed by Natural Resources Wales Conservation Officers in association with stakeholders and partners. The content of the Database was fully extended and updated during 2014/5.

3. Background

Flooding and coastal erosion have been identified as two of the biggest natural hazards affecting the safety and sustainability of communities across Wales[3]. Work carried out by the LIFE Natura 2000 Programme for Wales in 2014/15 has identified flood and coastal erosion risk management (FCERM) as a priority issue and risk affecting Natura 2000 habitat and species features[4]. This is consistent with the most recent round of UK level biodiversity reporting; the tenth UK 'Article 12 report'[5] and the third 'Article 17 report'[6] show that FCERM is having or has the potential to have, adverse impacts on the condition status of a variety of SAC and SPA features in both terrestrial and marine environments.

FCERM encompasses the impacts of coastal development (and associated defences), coastal squeeze, coastal flooding, coastal erosion and natural sediment processes, and beach management. As such, this Thematic Action Plan focuses on the coastal Natura 2000 features which are designated in the 17 marine and estuarine Natura 2000 sites (7 SACs and 10 SPAs) and 22 coastal and island Natura 2000 sites (12 SACs and 7 SPAs) in Wales[4]. Flooding and erosion issues relating to inland river catchments is covered in the *Life Natura 2000 Programme: Man-made Changes to Hydraulic Conditions Thematic Action Plan.*

The issues and risks to Natura 2000 features arising from FCERM can be both direct and indirect. Direct impacts include, for example, the reduction in the extent of habitat features, while indirect impacts, include, for example the loss of feeding areas for bird features.

Coastal squeeze is the process where intertidal habitats, such as saltmarsh, are progressively reduced in area and lose functionality when caught between rising sea levels and fixed sea defences or high ground.

Flooding and coastal erosion events result from a combination of high tides and stormy conditions e.g. if low atmospheric pressure coincides with a high tide, a 'tidal surge' may happen which can cause serious flooding. If high rainfall occurs at the same time, high river flow and freshwater flooding may exacerbate impacts on Natura 2000 features[3]. Severe events can result in significant environmental change such as erosion of sand dunes, beaches and soft cliffs, movement of shingle ridges and erosion of saltmarsh as witnessed during the 2013/14 winter storms[7]. There may also be detrimental effects due to inundation of freshwater habitats by saltwater and associated damage to sea defences which previously provided protection.

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[3] National Strategy for Flood and Coastal Erosion Risk Management in Wales: Summary. April 2012. http://gov.wales/docs/desh/publications/120412nssummaryen.pdf

[4] Natural Resources Wales, 2015. *LIFE Natura 2000 Programme for Wales Summary Report*.

[5] Joint Nature Conservation Committee 2013. *10th Report by the United Kingdom under Article 12 on the implementation of the Directive on the conservation of wild birds (2009/147/EC) from January 2008 to December 2012.* JNCC, Peterborough.

[6] Joint Nature Conservation Committee 2013. Summary of conclusions & qualifiers – 3rd UK Habitats Directive Reporting 2013**.**

[7] https://naturalresources.wales/media/1069/welsh-coastal-storms-december-2013-and-january-2014-an-assessment-of-environmental-change.pdf

Flooding and coastal erosion events carry a risk to life for those directly affected and to others who provide assistance[8]. They may also lead to structural damage to buildings, damage to transport links (rail and road) and impacts on key infrastructure located at the coast e.g. oil refineries and power stations[9]. Events may also result in deposition of sewerage and debris in properties and streets, and to the loss of agricultural land and livestock in rural areas[3]. The protection of natural resources or the maintenance of natural processes may therefore be a secondary priority against immediate needs to protect life, settlements and other infrastructure. However, it is important to note that intertidal and coastal habitats provide natural coastal protection and help to manage flood risk, whilst delivering a range of other ecosystem service benefits[10].

The likelihood of flooding and coastal erosion events are influenced by a number of factors (Table 1). Climate change predictions suggest that Wales will experience changes in rainfall patterns in the future, resulting in more frequent and more intense rainfall, and greater incidents of storm events[11]. Predicted sea level rise (>80 cm by 2105) will further increase rates of coastal erosion and may lead to significant flooding from the sea and subsequent coastal squeeze impacts on the Natura 2000 series. Therefore, this Thematic Action Plan should be considered in conjunction with the *LIFE Natura 2000 Programme: Climate Change and Habitat Fragmentation Thematic Action Plan.*

Table 1. Factors that may affect the likelihood of a flooding or coastal erosion event (modified from the National Strategy for Flood and Coastal Erosion Risk Management in Wales [3])

Flooding		Coastal erosion
Weather patterns		Prevailing sea conditions
		Frequency and severity of coastal storm events
Geology		The amount of sand or shingle on a beach
Topography		Sea levels
		Wave height and intensity
Land use		Geology
		Topography

[8] http://naturalresources.wales/media/1039/flood-and-coastal-erosion-risk-management-in-wales-2011-2014.pdf
[9] https://naturalresources.wales/media/1936/wales-coastal-flooding-review-phase-1.pdf; https://naturalresources.wales/media/1939/wales-coastal-flooding-review-phase-2-report.pdf
[10] LIFE Natura 2000 Programme for Wales. Inventory of ecosystem services provided by Natura 2000 in Wales, 2015.
[11] https://naturalresources.wales/media/1069/welsh-coastal-storms-december-2013-and-january-2014-an-assessment-of-environmental-change.pdf; http://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf

4. Issues and risks

Natura 2000 sites affected by FCERM include extensive marine sites with intertidal and subtidal habitats, marine mammals, saltmarsh, seabirds and wintering waders. Some sites, such as the Severn Estuary SAC, are predominantly intertidal in nature and are strongly affected by FCERM, whereas other sites such as Pen Llŷn a'r Sarnau SAC have large subtidal areas, which are less likely to be affected. Coastal Natura 2000 sites impacted by FCERM include coastal cliffs and maritime grasslands, sand dune and associated species, shingle and breeding seabirds e.g. Kenfig SAC, and Skokholm and Skomer SPA.

Issues and risks from FCERM for Wales were identified through the LIFE Natura 2000 Programme (in association with IPENS (*Improvement Programme for England's Natura 2000 sites*) for cross-border sites)[12], and summarised in site level Prioritised Improvement Plans (PIPs) and Site Improvement Plans (SIPs)[13] respectively.

The LIFE Natura 2000 Programme data shows that FCERM has (or is likely to have) an impact on 35 out of a total of 123 habitat and species features (29%) and in 17 of the 112 of the total Natura 2000 sites in Wales (15%). This corresponds to 17 of the 39 marine, estuarine, coastal and island Natura 2000 sites (44%). The sites and features most frequently identified as being affected by FCERM are provided in Tables 2 and 3 respectively. The full list of features identified as being impacted (or with the potential to be impacted) by FCERM are provided in Appendix A.

Table 2. Natura 2000 sites identified as being affected (or likely to be affected) by flood and coastal erosion risk management (FCERM) (listed alphabetically)

Natura 2000 sites
Abermenai to Aberffraw Dunes / Y Twyni o Abermenai i Aberffraw SAC
Anglesey Coast: Saltmarsh SAC / Glannau Mon: Cors heli SAC
Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd SAC
Carmarthen Bay Dunes / Twyni Bae Caerfyrddin SAC
Cemlyn Bay / Bae Cemlyn SAC
Dee Estuary / Aber Dyfrdwy SAC
Dee Estuary / Aber Dyfrdwy SPA
Dunraven Bay SAC
Kenfig / Cynffig SAC
Lavan Sands / Traeth Lafan SPA
Lleyn Peninsula and the Sarnau / Pen Llyn ar Sarnau / SAC
Menai Strait and Conwy Bay / Y Fenai a Bae Conwy SAC
Morfa Harlech a Morfa Dyffryn SAC
Pembrokeshire Marine / Sir Benfro Forol SAC
Severn Estuary / Môr Hafren SAC
Severn Estuary / Môr Hafren SPA
Ynys Feurig, Cemlyn Bay and the Skerries SPA

[12] https://www.gov.uk/government/publications/improvement-programme-for-englands-natura-2000-sites-ipens/improvement-programme-for-englands-natura-2000-sites-ipens
[13] http://publications.naturalengland.org.uk/category/5458594975711232

Table 3. Natura 2000 features most frequently recorded as being affected (or likely to be affected) by flood and coastal erosion risk management (FCERM)

Feature (common name)	Designation	Number of instances* feature affected		
		Site level	Unit level	Total
Estuaries	SAC	6	26	32
Intertidal mudflats and sandflats	SAC	7	20	27
Atlantic salt meadows	SAC	6	18	24
Glasswort and other annuals colonising mud and sand	SAC	4	10	14
Shallow inlets and bays	SAC	3	9	12
Reefs	SAC	3	8	11
Shifting dunes with marram	SAC	2	3	5
Humid dune slacks	SAC	2	2	4
Coastal lagoons	SAC	0	3	3
Dune grassland	SAC	3	0	3
Petalwort	SAC	2	1	3
Sea caves	SAC	1	2	3
Shore dock	SAC	0	3	3
Coastal shingle vegetation outside the reach of waves	SAC	0	2	2
Common redshank	SPA	2	0	2

**The 'number of instances' indicates the number of times FCERM is logged as an issue or risk for the feature at either a detailed management unit level or whole site level, on SACs and SPAs in Wales. This includes high, medium and low priority issues/risks.*

Management units are sub-divisions of Natura 2000 sites based on landownership or ecological differences. Issues and risks are recorded as either at a 'site level' (if the impacts occur across the site) or 'unit level' (if the impacts are localised).

The information is derived from the LIFE Natura 2000 Programme data held in the NRW Actions Database. Sourced September 2015.

See Appendix A for a full list of features affected.

A total of 148 instances of issues and risks related to FCERM were recorded across the Natura 2000 series, out of a total of 3,090 records (for all types of issue and risk) (5%). Of these 107 instances were recorded on individual management units, out of a total of 2,488 across Wales (4%), and 41 instances were recorded for whole sites out of a total of 602 (7%). For some Natura 2000 sites, issues and risks from FCERM were recorded at both a unit level, where a specific part of the site is affected and a management action has been identified at a localised spatial scale, and at the site level, for example where the National Habitat Creation Programme has identified targets for habitat creation for a site but the specific locations are yet to be determined.

Intertidal SAC habitats, for example, Estuaries and Intertidal mudflats and sandflats, in sites such as Pen Llŷn a'r Sarnau SAC and the Severn Estuary SAC, are the most commonly identified Natura 2000 features currently being affected (or with the potential to be affected) by FCERM. Whilst the site level instances of FCERM appear low, it is important to note that the frequency of intertidal features across Wales Natura 2000 network is also low. For example, the Estuaries feature is present in six SACs across the Wales Natura 2000 network, and FCERM was identified as an issue or a risk for the Estuaries feature at all of those sites.

Issues and risks from FCERM for intertidal features predominantly relate to direct effects, for example due to increased storminess and sea level rise, and impacts of FCERM policy such as the Shoreline Management Plans e.g. maintenance of sea defences ("hold the line" policy) versus managed realignment.

For coastal sites with dune systems, like Kenfig SAC, issues and risks identified are predominantly in relation to natural sediments processes or how human activities alter natural sediment processes and beach nourishment. Issues and risks to SPA bird features (e.g. Lavan Sands SPA) include potential disturbance, and loss of feeding and roosting areas.

5. Policy and legislative context

There is a broad framework of policy and legislation at the international, UK and Welsh levels which drive and support the management of Natura 2000. The primary European legislation is the Habitats and Birds Directives which aim to promote the conservation and management of natural habitats and wild species. Key UK legislation includes the Habitats Regulations, Wildlife and Countryside Act, and the Countryside and Rights of Way Act. Wales is developing a new approach to integrated and sustainable natural resource management through, for example, the Environment (Wales) Bill and the Nature Recovery Plan. Further information is provided in *the LIFE Natura 2000 Programme Facts and Figures Report.*

Over the past decade the development of policy, legislation and guidance relating to flood and coastal risk management (FCERM) has evolved significantly at European, UK Government and Welsh Government levels, including:

European

European Floods Directive 2007 - requires Member States to assess if water course and coastal lines are at risk from flooding, to map the flood extent and assets and human at risk in these areas and to take adequate and coordinated measures to reduce this flood risk.[14]

UK

Shoreline Management Plan Guidance 2007– Shoreline Management Plans (SMPs) provide a large-scale assessment of the risks associated with coastal processes that result in both erosion and flooding and presents a policy framework to reduce these risks to people and the developed, historic and natural environment[15]. They identify the most sustainable approach to managing the flood and coastal erosion risks to the coastline in the short (0-20 years), medium (20 to 50 years), and long term (50 to 100 years). They are developed by coastal groups with members mainly from local councils and Natural Resources Wales. SMPs are currently in their second iteration.

Marine and Coastal Access Act 2009 – provides the legal mechanism to help ensure clean, healthy, safe, productive and biologically diverse oceans and seas by putting in place a new system for improved management and protection of the marine and coastal environment, including marine licensing procedures and flood defense.

Flood Risk Regulations 2009 – implement the requirements of the European Floods Directive 2007. Regulations aim to provide a consistent approach to managing flood risk using a six year cycle of assessing, mapping and developing plans to manage flood risk.[16]

Flood and Water Management Act 2010 – aims to create a simpler and more effective means of managing the risk of flood and coastal erosion. The Act also aims to help improve the sustainability of our water resources and protect against potential

[14] http://ec.europa.eu/environment/water/flood_risk/
[15] http://www.westofwalessmp.org/
[16] http://naturalresources.wales/media/1039/flood-and-coastal-erosion-risk-management-in-wales-2011-2014.pdf

droughts.[17] Both the threat of flooding and water scarcity are predicted to increase with climate change.[18]

UK Marine Policy Statement – highlights issues for consideration in the development of Wales National Marine Plan in terms of climate change, coastal change and coastal flooding e.g. the need for consideration of how the marine environment can adapt to the impacts of climate change, and the implications of climate change for the timing and location of developments and activities.

Climate Change Act 2008 – framework to develop an economically credible emissions reduction path, and strengthened the UK's leadership internationally by highlighting the role it would take in contributing to urgent collective action to tackle climate change under the Kyoto Protocol. It also put in place a policy framework to promote adaptation action in the UK consisting of: UK Climate Change Risk Assessment (CCRA) and a National Adaptation Plan which is a long term strategy to address the main risks and opportunities identified in the risk assessment.[19]

Wales

Making the most of Wales' Coast: the Integrated Coastal Zone Management Strategy for Wales 2007 – provides a framework to facilitate integrated working on the coast and sustainable management of the coastal zone.

National Strategy for Flood and Coastal Erosion Risk Management in Wales 2011 – prepared under the terms of the *Flood and Water Management Act 2010*, the strategy provides a framework for flood and erosion risk management in Wales based on four overarching objectives:

- reducing the consequences for individuals, communities, businesses and the environment from flooding and coastal erosion;
- raising awareness of and engaging people in the response to flood and coastal erosion risk;
- providing an effective and sustained response to flood and coastal erosion events; and
- prioritising investment in the most at risk communities.

Planning Policy Wales 2014 – translates the Welsh Government's commitment to sustainable development into the planning system in the context of Local Development Plans. Include focus on planning for climate change impacts (e.g. rising sea levels and more extreme weather conditions), and the requirement to prepare for impacts through adaptation measures to limit consequences such as damage to property, infrastructure and the economy. Planning Policy Wales is supported by a series of Technical Advice Notes (TAN) that have relevance for FCERM. For example, *TAN 15: Development and Flood Risk* sets out the precautionary framework to guide planning decisions in areas at flood risk.

Climate Strategy for Wales: Adaptation Delivery Plan 2010 – sets out how the Welsh Government will act to reduce Wales' greenhouse gas emissions and explains how Wales will prepare for the impacts of climate change.

[17] http://www.groundwateruk.org/Flood-and-Water-Management-Act.aspx
[18] http://services.parliament.uk/bills/2009-10/floodandwatermanagement.html
[19] https://www.theccc.org.uk/tackling-climate-change/the-legal-landscape/global-action-on-climate-change/

6. Current mechanisms and planned actions on sites to 2020

The organisations with a statutory role as a Risk Management Authority and tasked with supporting the delivery of the Wales' National Strategy on FCERM are:

- the Welsh Government;
- Natural Resources Wales (NRW);
- the 22 Lead Local Flood Authorities (local authorities);
- the three Internal Drainage Boards that are wholly or mainly in Wales; and
- water and/or sewerage companies (e.g. Dŵr Cymru/Welsh Water).

The LIFE Natura 2000 Programme identified and costed actions to address issues/risks relating to flood and erosion control risk management on specific Natura 2000 sites during 2014/15 for the period to 2020. These actions are held in full in the NRW Actions Database and summarised in Prioritised Improvement Plans (and Site Improvement Plans for cross-border sites).

The most commonly identified actions, expressed in terms of the delivery mechanism, are shown in Table 4. This data includes high, medium and low priority actions. It shows the number of times mechanisms are listed against an action on a Natura 2000 site or management unit within a site and also specifies estimated costs and staff time. The majority of actions are proposed as needing to be led by the Welsh Government, local authorities and NRW – which reflects the role of the Risk Management Authorities outlined above. These key mechanisms to address FCERM issues and risks are described in more detail below.

Table 4. Mechanisms identified in the LIFE Natura 2000 Programme data to address issues and risks associated flood and coastal erosion risk management on Natura 2000 sites in Wales.

Mechanism	Total no of instances of mechanism	Total cost*	Total NRW staff days
Implementation of appropriate coastal management[20]	28	£44,900,400	290
Investigation	24	£175,000	345
Direct management	13	£522,000	579
Other	10	£40,000	50
Total	**75**	**£45,637,400**	**1264**

**The costs are broad estimated costs to deliver the action(s), rounded to the nearest thousand. In most cases the costs are calculated to 2020 except where longer term funding would be needed.The number of NRW staff days is the number of annual staff days x 5 (for number of years until 2020) which would be needed, plus the number of one-off staff days until 2020. Note that there are also a number of uncosted actions where more in depth action specific information would be required.*

[20] This number also includes the actions under the mechanisms "Site management statement production and agreement" for Network Rail.

Implementation of appropriate coastal management – (36% of actions). The most commonly identified mechanism which principally relates to the delivery of Shoreline Management Plans (SMPs) policies including (but not limited to):

- Feasibility studies on coastal management options, for example options studies for coastal defences (actions for local authorities and NRW), and development of coastal management implementation plans (NRW in partnership with local authorities); and

- Identification and creation of compensatory habitats through the National Habitat Creation Programme (NHCP).

The NHCP is the delivery mechanism for the Welsh Government's statutory obligation for compensatory measures under Article 6(4) of the Habitats Directive, relating to offsetting the impacts of coastal squeeze on Natura 2000 sites resulting from implementation of the Wales Shoreline Management Plans (SMPs) and Flood Risk Management Strategies (FRMS). The provision of timely compensatory habitats also manages some of the impacts associated with sea level rise and climate change on Wales' Natura 2000 network. The NHCP is led by NRW.

The creation of new intertidal habitat can also help meet obligations under the Water Framework Directive[21] and enable essential coastal flood risk management schemes and maintenance works to progress by facilitating legally-required compensation and mitigation works[22].

The scale of the requirements for the creation of intertidal habitats are identified within Habitats Regulations Assessments of the Shoreline Management Plans (SMP2s) and Flood Risk Management Strategies (Severn and Dee Estuaries) which look in detail at the sustainable protection of Wales' coastline from tidal flooding. The required habitat offset will be delivered at a project level through coastal managed realignment.

Investigation – (32% of actions). This mechanism indicates that further information is required to underpin decisions on appropriate action to address FCERM issues or risk. Examples of investigations include a desk based study of existing evidence to assess the need for beach nourishment works; a study into the potential relocation of a car park and other hard structures including identification and costs of suitable alternative sites; and an investigation into the feasibility of remobilising a shingle ridge.

Direct management – (17% of actions). This refers to management works to be carried out on the ground by an organisation(s) usually with a responsibility for / ownership of a particular geographical area. Examples of actions include dune remobilisation to restore successional vegetation stages, and beach nourishment works.

[21] New saltmarsh habitat can offset hydromorphological impacts within some heavily modified estuaries.
[22] The Habitats Directive and Water Framework Directive require that all plans and projects, including flood defence works, can only be undertaken and maintained if adverse effects on Natura 2000 sites have been ruled out or accounted for, under the rules for reasons of overriding public interest (IROPI) cases and Habitats Regulation Assessments (HRA).

7. Rationale for strategic actions

There are challenges to achieving and maintaining favourable conservation status of the Natura 2000 series in Wales in the face of climate change and sea level rise. While some actions to address flood and coastal erosion risk management (FCERM) issues and risks can be tackled effectively at a local level, many actions are more appropriately addressed at a large-scale or strategic level.

Practical actions to provide new coastal habitats are often costly, and recently published data demonstrates the considerable differences in undertaking managed realignment, with unit costs ranging from approximately £2000 to £120,000 per hectare[23]. Costs stem from realignment of coastal defences, and in some circumstances the building of new secondary defences, land purchase and the protection of major infrastructure (such as pylons and roads) and properties from tidal flooding. The scale of costs is site specific but it is clear that significant investment is required, and strategic long-term project planning is essential given that a small to medium (<50 ha) habitat creation project may take three years to deliver, and larger, more complex, up to 10 years.

The provision of timely compensation habitat demands a strategic approach that engages with all relevant coastal asset owner/maintainers and delivers joined-up projects of a larger scale. The rational for a strategic rather than project based approach to habitat creation (through the National Habitat Creation Programme) is implicit within the Habitat Regulations Assessments of the four Shoreline Management Plans and two Flood Risk Management Strategies (Dee and Severn Estuaries).

A strategic approach offers the best outcome for Natura 2000 as it facilitates the delivery of larger schemes (compared with small fragmented habitat offset) that have been identified and developed into fully funded capital projects. In doing so, it will minimise the risk of competing for suitable land, and enable a more joined up approach to securing funding and permissions, and to dealing with flood risk mitigation and access issues.

Practical actions are also likely to have ramifications beyond the local area due to coastal processes, and there is therefore value in coordinating and implementing FCERM at large spatial scales. Lack of knowledge of coastal processes and, for example, sediment budgets, and the scale of impacts of human activities (e.g. aggregates) on them is often a factor in limiting progress towards delivering favourable condition of Natura 2000 features on sites. In many cases, these evidence gaps are likely to be best addressed and funded at a strategic level.

Socio-economic, safety and political aspects also need to be taken into account. Better understanding of the benefits of sustainable coastal management (e.g. the ecosystem services delivered by coastal habitats) needs to be developed and effectively communicated to professional practitioners and senior decision-makers, communities affected and public. Some actions are dependent on implementing or changing legislation, plans, strategies or policies, and whilst there is an established framework of policy and guidance in the area of FCERM, not all objectives and mechanisms are fully aligned. For example, there is a need to join-up Shoreline Management Plans with existing licencing processes. Work also needs to be done to ensure that national or regional plans are applicable at a local scale. Clarity of roles, better communications

[23] ABPMER 2015. The cost of undertaking managed realignment schemes in the UK Briefing Note, May 2015.

between organisations and longer term planning are also areas which could be improved.

To ensure these broader issues are fully taken account of, a set of strategic actions have been developed as laid out in Section 9 of this plan. The focus for the development of the strategic actions has been on identifying gaps in current management to improve future management and decision making, and ultimately the condition of N2K features across Wales.

8. Development of strategic actions

The strategic actions to manage and address impacts arising from flood and coastal erosion risk management (FCERM) on Natura 2000 features (shown in Section 9) have been developed through a process of engagement, in combination with analysis of the LIFE Natura 2000 Programme data. At an initial NRW workshop (October 2014), participants were asked to consider existing management approaches for FCERM, and suggest new actions that could help to address impacts from FCERM across the Natura 2000 network. The outputs of this workshop were reviewed by a working group comprising of FCERM specialists from within NRW, and a draft version of strategic actions were developed.

The draft strategic actions were made available for comment to a wider audience through a series of three workshops during the summer of 2015. The first workshop was open to sector leads from the Welsh Government, while the second and third workshops (held on the 19 and 25 August 2015, in Garwnant and Bangor respectively) were attended by representatives of interested organisations in Wales, from, for example, the third sector, local authorities, and other user groups. There was a total of 84 attendees. The consultation drafts were also made available to others unable to attend these events on request. Feedback on the strategic actions was received from a wide range of stakeholders (including the Welsh Government, local councils, environmental non-governmental organisations and European Marine Site Officers), and was used by the working group to finalise the strategic actions.

The strategic actions are intended to be SMART (Specific, Measurable, Assignable, Realistic and Time-related) and therefore information has been provided on costs and time-scales where possible. One or more proposed delivery organisations are also listed against each action. The intention is that the organisation designated as lead would drive the action forward, collaborating with other partners and stakeholders as necessary. Whilst the majority of actions have a timeframe of pre-2020, it is anticipated that work would be required beyond this date. The plan also identifies where strategic actions could meet objectives of other policies and work programmes.

9. Strategic actions for Natura 2000 in Wales: Flood and Coastal Erosion Risk Management

The following represent a list of proposed actions needed to make progress towards favourable condition of Natura 2000 (N2K) features. They do not represent a fully funded or committed operational plan.

	Action	Detail	Priority	Link to existing work programmes	Proposed lead organisation	Proposed partner organisation(s)	Estimated cost (£)	Proposed timetable
1	Implement and review marine licencing processes to assess the efficacy of the new procedures in protecting the integrity of the N2K features in the context of Shoreline Management Plans (SMPs).	New processes have already been developed and implemented. This action is to review these processes to assess against the achievement of intended outcomes. This action is also linked to actions 5, 6, 9 and 10 below regarding maintenance works and licensing, implementation of SMP policies, and delivery of the National Habitat Creation Programme (NHCP). Where Habitats Regulation Assessment (HRA) for projects identify adverse effects and no alternatives, and IROPI procedures are required, it will be necessary to confirm provision of compensatory habitat.	High	SMPs NHCP River Basin Management Plans	Natural Resources Wales	Welsh Government	Staff time	2017
2	Ensure that the Welsh Government Flood and Coastal Risk Management Programme continues to consider implications for N2K features and RBMPs, and that any mitigation or compensation requirements through proposed flood and coastal erosion defence schemes are accounted for within funding considerations.	The Welsh Government's Flood and Coastal Investment Programme aims to prioritise investment across flood and coastal erosion risk to spend where risks are greatest. When a coastal project is funded it should take account of the implications of the scheme in terms of compensation and mitigation, and where possible consider opportunities for enhancement.	High	WG FCERM Flood and Coastal Investment Programme Water Framework Directive River Basin Management Plans	Welsh Government	Natural Resources Wales Welsh Local Government Association Local Authorities	Staff time	2018
3	Progress work to develop a strategy for sustainable transport networks in the context of climate change and Shoreline Management Plan policies.	To address the significant length of transport network assets (rail and road) which are at risk of coastal flooding and/or erosion. Linked to potential need for provision of compensatory habitat if current transport networks are maintained. See Action 1, part of SMP implementation.	High	SMPs	Welsh Government Network Rail Local Authorities	Natural Resources Wales	Staff time	2018

	Action	Detail	Priority	Link to existing work programmes	Proposed lead organisation	Proposed partner organisation(s)	Estimated cost (£)	Proposed timetable
4	Deliver the National Habitat Creation Programme (NHCP).	NHCP addresses losses as a result of implementing hold the line policies. The Programme currently only deals with offsetting the projected hold the line losses for NRW assets, although can deliver compensation for other asset owners though partnership. The Programme is linked to Epochs (up to 2025) in SMPs and refined through HRA of strategies for the Severn and Dee Estuaries. Losses and gains will be revaluated periodically to ensure pace of compensation delivery is appropriate.	High	Implementation of SMPs NHCP	Welsh Government (competent authority)	Natural Resources Wales (delivering NHCP on behalf of WG) Other delivery partners e.g. Network Rail, Local Authorities	Estimate for delivering Epoch 1 requirements: £10-15M (see individual PIPs for details) NB this does not include the costs for the Severn Estuary (see Action 4b)	2025 - ongoing
5	Develop understanding of and guidance for sediment management in N2K sites.	Initial phase would include developing better understanding of sediment budgets at a regional scale including: dredging, aggregate extraction, coastal management and land drainage.	High	DEFRA / EA / WG / NRW FCERM Joint R&D programme – regional sediment budget project Welsh National Marine Plan and its supporting policies Potential sand dune LIFE bid	Natural Resources Wales (Crown Estate, Local Authorities)	Crown Estate and other seabed owners Welsh Government Local Authorities Port and harbour authorities Academia and third sector	Joint R&D programme is scoping the sediment budget analysis work, but anticipate that this could require quite a large research budget £200k+	2020
6	Develop local adaptation plans to implement SMPs, and keep delivery of those plans under review.	Develop a methodology for implementing SMPs at a local level In particularly where a change in policy from Hold The Line to no active intervention or managed realignment (MR) is identified between the first or second epochs. Failure to implement MR and no -active-intervention policies could result in addition impacts on N2K sites which should be kept under review.	High	Coastal Review Delivery Plan SMP implementation	Welsh Government Local Authorities	NRW Welsh Local Government Association Coastal Groups	TBC as part of coastal review delivery plan	Epoch 1 adaptation plans by 2020 Epoch 2 by 2025
7	Develop guidance for managing maintained assets. This should include development of policies for repair, replacement and improvement of assets and approach to dealing with storm damage.	This should include review of maintenance exemptions under the Marine and Coastal Access Act. The guidance should be developed in partnership with risk management authorities.	High	Network Rail Risk Register	NRW Welsh Government	WLGA Local Authorities Network Rail	Staff time Extra resource may be required to develop ~£20-30K	2018

	Action	Detail	Priority	Link to existing work programmes	Proposed lead organisation	Proposed partner organisation(s)	Estimated cost (£)	Proposed timetable
8	Develop and implement a robust programme of measurement of coastal change secure in the long term, to underpin delivery of NHCP and other coastal management actions. Outputs should also be used to validate and update SMPs.	Take account of recommendations within the “Storm Report” and SMP Action Plans.	High	Coastal Flood Review Delivery Plan Wales Coastal Monitoring Centre NRW monitoring programmes and links to external research Space Watch (UK Space Agency and NOC project)	Welsh Government Natural Resources Wales	Natural Resources Wales Local Authorities Academia and third sectors	Wales Coastal Monitoring Centre Draft Business case options for a five year programme range from £1.5 to 4.7 million	2016
9	Assess impacts of climate change on the Natura 2000 series, relating to no-active-intervention (NAI) policy units.	Assessment of the scale of impacts on the Natura 2000 series from related coastal squeeze.	Medium	Marine licensing	Natural Resources Wales	Welsh Government	£50k	2018
10	Consider opportunities for sand engine pilot projects, beach nourishment and beneficial use of maintenance dredged material with a view to improving resilience of N2K features.		Medium	Potential sand dune LIFE bid Sand-scaping pilot work	Local Authorities Crown Estate (Natural Resources Wales)	Crown Estate Welsh Government Welsh Local Government Association Local Authorities Port and harbour authorities Academics and third parties	£30-50K for investigation. Delivery of beach nourishment or sand-scraping estimated to be £millions	2019

Appendix A: Natura 2000 features recorded as being adversely affected (or having the potential to be adversely affect) by flood and coastal erosion risk management on sites

Data derived from the NRW Actions Database following work by the LIFE Natura 2000 Programme. High, medium and low priority issues/risks are included. Instances may be recorded for the whole site or at a more detailed 'management unit' (sub-site) level.

Data from September 2015.

Natura 2000 feature (common name)	Number of instances feature affected		
	Site level	Unit level	Total
Estuaries	6	26	32
Intertidal mudflats and sandflats	7	20	27
Atlantic salt meadows	6	18	24
Glasswort and other annuals colonising mud and sand	4	10	14
Shallow inlets and bays	3	9	12
Reefs	3	8	11
Shifting dunes with marram	2	3	5
Humid dune slacks	2	2	4
Coastal lagoons	-	3	3
Dune grassland	3	-	3
Petalwort	2	1	3
Sea caves	1	2	3
Shore dock	-	3	3
Coastal shingle vegetation outside the reach of waves	-	2	2
Common redshank	2	-	2
Common shelduck	2	-	2
Dunlin	2	-	2
Eurasian curlew	2	-	2
Eurasian oystercatcher	2	-	2
Fen orchid	1	1	2
Otter	-	2	2
Shifting dunes	1	1	2
Annual vegetation of drift lines	1	-	1
Bewick's swan	1	-	1
Black-tailed godwit	1	-	1
Dunes with creeping willow	1	-	1
Eurasian teal	1	-	1
Gadwall	1	-	1
Grey plover	1	-	1
Grey seal	1	-	1
Northern pintail	1	-	1
Red knot	1	-	1
Russian white-fronted goose	1	-	1
Subtidal sandbanks	1	-	1
Waterbird assemblage	1	-	1