



Cynllun Gweithredu Thematig Natura 2000 Newidiadau gan Ddyn i Amodau Hydrolig

Natura 2000 Thematic Action Plan Man-made Changes to Hydraulic Conditions

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



LIFE N2K Wales: LIFE Nat11/UK/385
Supported by LIFE, a financial instrument of the European Community

Published by:
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Acknowledgements

Many thanks to everyone within Natural Resources Wales and externally who contributed to the development of strategic actions for this Thematic Action Plan during the LIFE Natura 2000 Programme workshops or subsequent engagement period.

In particular thanks go to the following specialist who reviewed and refined the strategic actions: Peter Jones.

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 hymrwymiaidau 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 risgiau¹ 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 hydrolog
- 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 grynodedbau 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 8 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 ddiweddarau'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 of the Programme 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 1*.

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 risks² 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 and which act as barriers to the designated habitat or species features reaching favourable condition. Risks (or threats) are adverse 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, 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 aim 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

Work carried out by the LIFE Natura 2000 Programme for Wales in 2014/15 has identified man-made changes to hydraulic conditions as a priority issue affecting Natura 2000 features in Wales.³ This is consistent with the most recent round of UK level biodiversity reporting; the 10th UK 'Article 12 report'⁴ and the 3rd 'Article 17 report'⁵ show that inappropriate hydraulic conditions is having (or has the potential to have) adverse impacts on the condition of SAC and SPA features in across the UK.

This Thematic Action Plan considers existing issues (pressures) and potential future risks (threats) likely to have an impact by 2020 due to man-made changes to hydraulic conditions in inland river catchments. It focuses on terrestrial wetland habitats (e.g. bogs and fens) and open freshwater habitats (e.g. rivers and lakes). The plan does not cover impacts on marine Natura 2000 sites and features which are addressed by the *Flood and Coastal Erosion Risk Management Thematic Action Plan*.

The term man-made changes to hydraulic conditions encompasses a range of sub-issues which relate to water management, flood management, agriculture and land management and navigation, as shown below:

- Channelisation
- Ditch management
- Drainage
- Dredging – maintenance
- Historic water abstraction infrastructure
- Inland flood defence and erosion control
- Modified water courses
- Water abstraction
- Weirs and other in-channel structures
- Water levels (including barriers to natural hydrology and altered water flow)

Rivers, lakes and wetlands provide important ecosystem services which are of major benefit to Welsh communities and the economy. If the component habitats are in good condition they can play key roles in climate change mitigation, flood protection and water quality. Wetlands provide a climate regulating service by sequestering carbon from the atmosphere. Rivers, lakes and wetlands contribute to the mitigation of flood propagation where wetland vegetation can slow down the movement of water by increasing the 'hydraulic roughness' of flood plains⁶.

³ Natural Resources Wales, 2015. *LIFE Natura 2000 Programme for Wales Summary Report*.

⁴ 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.

⁵ Joint Nature Conservation Committee 2013. *Summary of conclusions & qualifiers – 3rd UK Habitats Directive Reporting 2013*.

⁶ Baker, C., Thompson, J.R. & Simpson, M. (2009) Hydrological dynamics I: Surface waters, flood and sediment dynamics. *The Wetlands Handbook* (eds E. Maltby & T. Barker), pp.120–168. Wiley-Blackwells, Chichester.

4. Issues and risks

The LIFE Natura 2000 Programme data shows that man-made changes to hydraulic conditions have (or are likely to have) an impact on 43 out of 123 habitat or species features (36%) on 45 out of 112 Natura 2000 sites in Wales (40%). Table 1 provides a list of features most frequently affected. For a full list of sites and features affected see Appendices A and B respectively.

A total of 315 instances of issues and risks related to man-made changes to hydraulic conditions were recorded across the Natura 2000 series, out of a total of 3,090 records (for all types of issue and risk) (10%). Of these 284 instances were recorded on individual management units, out of a total of 2,488 across Wales (11%), and 31 instances were recorded for whole sites out of a total of 602 (5%).⁷

Table 1. Natura 2000 features most frequently recorded as having (or likely to have) impacts arising from man-made changes to hydraulic conditions

Natura 2000 feature (common name)	Number of instances feature affected*		
	Unit level	Site level	Total
Blanket bog	69	-	69
Degraded raised bogs	43	5	48
Otter	36	8	44
Atlantic salmon	34	9	43
River lamprey	31	9	40
Calcium-rich springwater-fed fens	34	5	39
Brook lamprey	32	6	38
Bullhead	32	6	38
Calcium-rich fen dominated by great fen sedge –saw sedge-	30	4	34
Purple moor-grass meadows	29	4	33
Sea lamprey	18	9	27
Active raised bogs	17	6	23
Humid dune slacks	21	1	22
Dunes with creeping willow	19	-	19
Freshwater pearl mussel	15	3	18
Rivers with floating vegetation often dominated by water-crowfoot	14	4	18
Floating water plantain	15	-	15
Wet heathland with cross-leaved heath	13	-	13
Calcium-rich nutrient-poor lakes, lochs and pools	10	3	13
Fen orchid	11	2	13

The 'number of instances' indicates the number of times man-made changes to hydraulic conditions 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.

⁷ In general, for a given site, issues and risks are recorded at *either* a unit level (if part of the site is affected) or site level (if the whole or majority of the site is affected); not both.

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 affects 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.

Much of the habitat degradation seen within Natura 2000 rivers, such as the River Wye, River Usk, Afon Eden – Cors Goch Trawsfynydd, Afonydd Cleddau and Afon Teifi and their floodplains is linked to historical and current changes caused by water abstraction, land management (including agriculture) and the modification of water courses by channelization, flood defences, weirs and other in-channel structures. This negatively impacts both feature habitats and species including Rivers with floating vegetation, Otters, Atlantic salmon, Lampreys, Floating water plantain and Freshwater pearl mussels.

Many wetland systems supporting Natura 2000 features such as blanket bogs, active raised bogs, and fen habitats, suffer from barriers which can affect their natural hydrology (i.e. historic railway/tram tracks on Fenn`s, Whixall, Bettisfield, Wem and Cadney Mosses SAC) and altered water flows which as well as impacting on hydrology can also lead to nutrient rich water being diverted on to sites. Intensive land drainage, agricultural changes and peat cutting can cause water to drain away from peat bogs and lead to them drying out. This reduces the ability of wetlands to control flood water and function as a carbon store.

The upland and lowland lakes of Wales designated under the Natura 2000 network are impacted by drainage, water abstraction and changes in water levels which affect their habitat condition. The issues affect both naturally nutrient-rich lakes, such as Llangorse Lake and Llyn Dinam SACs and the nutrient-poor lakes, lochs and pools found on Corsydd Môn, Migneint–Arenig–Dduallt and Rhinog SAC.

The impact of most licenced abstractions have been resolved or there are plans to resolve them in the near future as they have undergone Habitat Regulation Assessment through the Review of Consents process. However, there are still some localised impacts associated with infrastructure installed as part of historic unlicensed abstractions (orphaned assets).

5. Policy and legislative context

There is a broad framework of policy and legislation at the international, UK and Welsh level which drives and supports the management of Natura 2000. The primary European legislation is the Habitats Directive and the Birds Directive which 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 1*.

Policy and legislation which specifically relates to the issue man-made changes to hydraulic conditions as follows:

International and European

- **Water Framework Directive⁸ (WFD):** The WFD establishes a framework for the protection of inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater. It aims to ensure that all aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands meet 'good status'. Its objectives include promoting sustainable water use and improving aquatic ecosystems.

The WFD sets out clear objectives for water protection that must be achieved by specified dates. It requires a management plan for each river basin district which seeks to protect and improve the ecological health of rivers, lakes, canals, wetlands, estuaries and coastal and groundwater for the wider benefits of people and wildlife. These River Basin Management Plans (RBMP) are subject to a continuous cycle of review and update, with Cycle 2 RBMPs due for publication by the end of 2015.

Domestic

- **Water Strategy for Wales 2014** – outlines the long-term policy direction of the Welsh Government in relation to water resources. It aims to ensure that the water resources of Wales are resilient and sustainably managed and outlines the need to develop a more integrated approach to water resource management as part of natural resource management. The Water Strategy for Wales will inform the National Natural Resource Policy Statement as proposed in the Environment (Wales) Bill.
- **Floods and Water Management Act 2010** – provides for better, more comprehensive management of flood risk for people, homes and businesses, helps safeguard community groups from unaffordable rises in surface water drainage charges, and protects water supplies to the consumer.

⁸ Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy.

- **Environment Act 1995** – assigns a number of duties which include the conservation of natural resources and the conservation or enhancement of the environment.
- **Land Drainage Act 1994** – requires that a watercourse be maintained by its owner in such a condition that the free flow of water is not impeded.
- **Water Act 2003 and 2014** – amends the Water Resources Act 1991 to improve long-term water resource management. The four broad aims of the Act are the sustainable use of water resources; strengthening the voice of consumers; a measured increase in competition; and the promotion of water conservation.
- **Water Resources Act 1991** – consolidates legislation in relation to water resources.
- **Water Resources (Abstraction and Impoundment) Regulations 2006** – contain provision relating to the licencing of abstraction and impounding of water in England and Wales.
- **Environmental Permitting Regulations 2010** – abstractions near Natura 2000 sites have to carry out a pumping test and there is a limit to the volume which can be taken.
- **Environmental Impact Assessment (Agriculture) (Wales) Regulations 2007** - a screening decision is required for planned agricultural improvements on uncultivated land or semi-natural areas; or projects involving restructuring of rural land holdings on any agricultural land type. This covers the creation of new drains or modifying (upgrading) existing ones in semi-natural habitat.

6. Current mechanisms and planned actions on sites to 2020

During 2014/15, the LIFE Natura 2000 Programme identified and costed actions to address issues relating to man-made changes to hydraulic conditions on Natura 2000 sites for the period to 2020. These actions are held in full in the NRW Actions Database and summarised in PIPs. A total of 399 proposed actions were identified across the Natura 2000 series, at an estimated total cost of nearly £19 million to 2020.

Actions expressed in terms of the main delivery mechanism are shown below in Table 2. This includes high, medium and low priority actions. These actions include those which are planned or already underway. 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.

Table 2. Key mechanisms identified in the LIFE Natura 2000 Programme data to address issues and risks associated with man-made changes to hydraulic conditions across Natura 2000 sites in Wales

Mechanism	Total number of instances of mechanisms	Total cost*	Total NRW staff days*
Direct management	123	£16,247,000	3,982
Investigation	114	£487,600	748
NRW management agreement	82	£2,024,000	893
Abstraction licence (revoke or amend)	25	£0	50
Appropriate dredging programme	14	n/a	n/a
Issue notice/consent	11	£0	18
Water Level Management Plan	7	£21,000	104
Flood risk management – capital/ improvement scheme and operational work	7	£170,000	55
Facilitate establishment of Commons Council	5	£0	3

**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 estimated 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 a number of uncostered actions, due to the difficulty of estimating costs where more in-depth action specific information is required.*

The primary mechanisms used to address man-made changes to hydraulic conditions on Natura 2000 sites in Wales are described in more detail below.

- **Direct Management** is the most frequently identified mechanism, is when NRW or other organisations undertake work directly on their own land/assets or undertake work on private land with the agreement of the current land owners and/or tenants. This includes a range of ground work actions such as ditch management to solve

drainage issues, re-meandering river streams and removing weirs and other structures.

In the case of privately owned land this mechanism is often selected for actions which involve the need for technical expertise and or specialist machinery (i.e. installing piling on wetland sites to increase water levels or redirecting ditches to reinstate more natural hydrological functionality).

- **Investigations:** LIFE Natura 2000 data shows that in many cases where man-made hydraulic changes are impacting Natura 2000 features, investigations have yet to identify the cause of observed habitat deterioration taking place or the level and extent of the impact. Therefore, investigations in the form of surveys or studies are required.

These investigations range from in depth hydrological assessments on wetlands to local site visits involving NRW staff. Site visits are often needed for mapping purposes (e.g. establish location of drains on a site) as well as to identify the cause of observed habitat deterioration if unknown. Many of these investigations are expected to generate new management actions.

- **NRW Management Agreements** are made with landowners to implement specific agricultural, land or water management actions within and/or adjacent to Natura 2000 sites with the aim of improving the condition of the features. Agreements are sought to address hydrological issues primarily by implementing appropriate ditch management, and river restoration actions detailed within restoration plans for a site.
- **Abstraction Licence (revoke or amend):** Planning applications and new abstraction licences are subject to Habitat Regulation Assessments (HRA) to prevent licences/permits adversely impacting Natura 2000 sites (for example, via modifications to the water courses or impacts on hydrology). Abstraction Licences issued prior to the introduction of HRA were subject to a Review of Consents process by NRW (as required by the Habitats Directive) to ensure that individual licences do not affect the integrity of the site in the future. Improvements proposed by the review are still being implemented, for example, changes to abstraction infrastructure to improve fish migration.

Water abstraction is also managed under regional Abstraction Licensing Strategies (ALS). Abstractions found to be causing environmental damage are being considered as part of the NRW Restoring Sustainable Abstraction (RSA) programme. The RSA programme has helped to identify improvements that will contribute to meeting objectives under the Water Framework Directive.

7. Rationale for strategic actions

The Natura 2000 actions identified in the Prioritised Improvement Plans and the Actions Database are predominantly site-based. These can produce good results at a local level, and have practical advantages, for example, Conservation Officers or site managers often have detailed knowledge about the requirements of the site. However, localised actions have little ability to tackle broader factors and root causes of inappropriate hydraulic changes nor are they generally able to consider novel or innovative approaches.

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 strategic actions focus on four main topics:

- Integration of Natura 2000 needs into current management programmes
- Review of current regulatory and permitting regimes, legislation and policy
- Development and delivery of projects on key Natura 2000 sites
- Development of restoration plans

Delivery of the strategic actions will require collaborative working between Natural Resources Wales, the Welsh Government, landowners and occupiers, public, private and third sector organisations. It is anticipated that the strategic actions will be used to guide future work programmes.

As there is a comprehensive legal and policy framework in Wales relating to water management and resources, all strategic actions aim to be consistent with, and integrated into that framework. In particular, actions identified in Prioritised Improvement Plans and in this Thematic Action Plan have informed the River Basin Management Plan Programme of Measures and therefore will contribute to achieving objectives under both the Water Framework Directive and Habitats Directive.

8. Development of strategic actions

The following table in Section 9 describes the strategic actions required to manage and address impacts from man-made changes to hydrological conditions on Natura 2000 features.

The strategic actions were developed through a process of consultation in combination with analysis of the LIFE Natura 2000 Programme data. Summary outputs of the data from Natura 2000 sites was used to provide contextual background for workshops as follows:-

- Marine Workshop: 16 October 2014, Bangor
- Rivers Workshop: 12 February 2015, Aberystwyth
- Wetlands Workshop: 22 April 2015, Aberystwyth
- Lakes Workshop: 8 July 2015, Aberystwyth

Attendees were specialists from Natural Resources Wales with an expertise in hydrology and conservation management. Participants were asked to consider existing management methods for issues arising from man-made changes to hydraulic conditions and to identify new strategic actions which could address impacts regionally or at a Welsh or UK level. These actions were then reviewed by a small working group.

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 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, farming unions and other user groups. There was a total of 84 attendees. The consultation drafts were also available to others unable to attend these events on request. The feedback received was reviewed and included in the actions as appropriate.

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. A proposed lead delivery organisation is listed against each action. The intention is that this organisation will drive the action forward, collaborating with other partners and stakeholders as necessary.

9. Strategic actions for Natura 2000 in Wales: Man-made changes to hydraulic conditions

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

STRATEGIC ACTIONS – GENERAL

	Action	Detail	Priority	Links to existing work programmes	Proposed lead organisation	Proposed partner organisation(s)	Estimated cost (£)	Proposed timetable
1.1	Integrate Natura 2000 (N2K) needs into NRW Flood Risk Management Plans and Local Authority Flood Risk Management Programmes, and identify opportunities for utilising FRM resources for N2K benefit and delivering multiple benefits through FRM operations.	Integration to include:- <ul style="list-style-type: none"> Minimisation of harm (e.g. inappropriate dredging). Promotion of natural approaches to flood defence (specifically bioengineering and natural flood management). Use FRM resources (staff and machinery) when on site or during quiet periods to undertake N2K actions such as ditch blocking and weir removal. 	High	Flood Risk Management programme NRW Environmental Appraisal Team NRW Casework Teams	Natural Resources Wales	Local Authorities Welsh Government	Staff time only	2016-2020
1.2	Review opportunities for Glastir to better support and prioritise N2K wetlands/peatlands conservation management and water level management.	Recommended changes: <ul style="list-style-type: none"> Include all N2K wetlands/peatlands in the Glastir target areas. Consider the role of carbon sequestration and protect existing carbon stores. Make the ditch blocking prescription more financially attractive to landowners. Consider making improvement of hydrological conditions a mandatory element within impacted N2K sites. Develop option to support modified water levels (possibly for groups of landowners). Undertake training of Glastir contract managers on wetland/peatland issues. Update target layers with new peat distribution data. Consider introducing an option to block erosion gullies on bare peat. 	High	Glastir WG agricultural policy	Welsh Government	Natural Resources Wales National Parks	Staff time only	2020
1.3	Complete actions to address abstraction licences identified in the Review of Consents process as having an adverse impact on site integrity.	Prioritise the need to address any impacts from abstractions and/or their associated infrastructure which were identified during the Review of Consents process.	Medium	Asset Management Plan Restoring Sustainable	Natural Resources Wales	Water Companies		2018

				Abstractions programme				
1.4	<p>Review relevant regulatory and permitting regimes to ensure that practice reflects N2K requirements (i.e. that N2K requirements, ecological impacts and ecosystem approach is being adequately weighted when consents are being assessed). In particular, research the in-combination effects.</p> <p>Create new guidance and provide relevant training to development/permitting staff.</p>	<p>Specifically consider in-combination effects of:</p> <ul style="list-style-type: none"> • Abstractions and/or impoundments • HEP on whole river systems 	Medium		Welsh Government	Natural Resources Wales Local Authorities		2018
1.5	<p>Review (gap analysis) and strengthen the effectiveness and enforcement of relevant legislation and policy to improve its ability to deal with hydrological and hydromorphological issues on and directly adjacent to N2K sites.</p>	<p>In particular:</p> <ul style="list-style-type: none"> • Review legislation (Salmon and Freshwater Fisheries Act) to identify changes which would facilitate improvements to fish passage over/ effective screening on third party barriers. • Review NRW policy/procedure regarding 'emergency works' to ensure that that such works are properly defined and only done when essential. (Emergency works are done urgently outwith the normal regulatory process). • Produce up-to-date guidance to assist Local Authorities and Lead Local Flood Authorities to implement WFD assessments on ordinary watercourses. • Review the need to regulate currently exempt abstractions. 	Medium	NRW Licencing Reform Group	Welsh Government Natural Resources Wales	Local Authorities		2020

STRATEGIC ACTIONS – WETLANDS

	Action	Detail	Priority	Link to existing work programmes	Proposed lead organisation	Proposed partner organisation(s)	Estimated cost (£)	Proposed timetable
2.1	Develop a strategic and innovative approach for tackling difficult, entrenched issues on N2K sites connected to raising water levels and its detrimental effect on neighbours and tenants.	<p>To include the development of appropriate mechanisms such as compensation or land purchase (i.e. purchase and lease back or land-swap), and identification of funding sources.</p> <p>Review current policy and legislation (Land Drainage Consents, Impoundment Licences, Water Level Management Plan implementation, WFD integration with N2K site objectives) in relation to water level management and identify changes which are needed to be better able to implement appropriate water level management on N2K wetland sites.</p> <p>Produce a priority list of SAC which have water level issues which need to be targeted for actions including need for projects, boundary reviews and /or land purchase in order to facilitate the raising water levels.</p>	High		Natural Resources Wales	Welsh Government Farming unions	Staff time only	2015-2020
2.2	Support the development and delivery of at least one major externally funded project on key lowland wetland sites which are failing to reach favourable condition based on hydrological issues.	<p>Habitats include raised bogs, fens, transitional mires, on for example:</p> <ul style="list-style-type: none"> • Cors Fochno • Cors Caron • Corsydd Eifionydd • Rhos Goch • Cors Crymlyn • North Pembrokeshire Commons <p>To include other relevant issues (e.g. diffuse pollution, habitat restoration).</p>	High		Welsh Government	Natural Resources Wales	£2 m per project	2018-2023
2.3	Support the delivery of the Welsh Government National Peatland Restoration Programme.		High		Welsh Government	Welsh Peatlands Action Group		2015-2020
2.4	Carry out a programme of targeted engagement and awareness raising aimed at farmers and landowners to highlight the value of wetlands.	<p>Provide information, advice and support to land owners about the effect of different management options and agricultural practices and the equipment/skills needs to implement these, and funding options available (e.g. Glastir, Section 15 agreements).</p> <p>To support the engagement programme, assemble further evidence about the impact of drainage and the benefits of rewetting/restoration in terms of ecosystem services particularly carbon sequestration.</p>	Medium		Natural Resources Wales	Third sector		2016-2020

STRATEGIC ACTIONS – RIVERS

	Action	Detail	Priority	Link to existing work programmes	Proposed lead organisation	Proposed partner organisation(s)	Estimated cost (£)	Proposed timetable
3.1	<p>Emphasise natural processes, river restoration and green engineering principles, when undertaking flood risk and other river management on N2K rivers, by:-</p> <p>a) Developing a Wales-wide policy to this effect</p> <p>b) Amending legislation where necessary</p> <p>c) Producing guidance, case studies and delivering training for practitioners.</p> <p>d) Apply policy to NRW and Local Authority consents and direct management.</p> <p>e) Investigating current information (and identifying gaps in knowledge) in order to assess the effectiveness of hard engineering flood risk measures in comparison to other flood risk measures within N2K sites/catchments.</p>	To include, a presumption against hard engineering, and an expectation that new technology and bioengineering techniques will be employed. Aim to restore natural flows and geomorphology, and strictly limit new impoundments, in-river structures and artificial modification.	High	Flood Risk Management	Natural Resources Wales	Welsh Government Local Authorities	Staff time only	2015-2029
3.2	Support the development and delivery of at least one major longer-term large-scale N2K river restoration/re-wilding project on a significant catchment(s) in Wales to rehabilitate historic damage and restore to natural functioning (flow, form, function and flood plain) by undertaking river restoration and/or removal of partial/full barriers to migration.	To including identification of appropriate priority sites/catchments (e.g. Teifi at Cors Caron), funding source and approach to delivery (e.g. externally funded project). To include natural resource management approach, incorporating social, community, water quality factors.	High	NRW Operational Place-based Teams	Welsh Government	Natural Resources Wales Rivers Trusts Afonydd Cymru	£5 m per project	2018-2023
3.3	Develop a river restoration plan for all SAC rivers (which do not have one), within a Wales-wide strategic framework.	Identify actions/methods of delivery, costs and locations of necessary work e.g. reinstatement of meanders, removal of in-river structures, fencing of banks, gravel starvation, restoration of natural flow etc. Incorporate information into NRW Actions Database/PIPs.	High		Natural Resources Wales	Water Companies Rivers Trusts Afonydd Cymru		2019
3.4	Review the consenting regime for ordinary watercourses and main watercourses with a view to providing greater consistency in responses.	The review should consider whether a single consenting body would be appropriate.	Medium		Natural Resources Wales	Local authorities		

Appendix A: Natura 2000 sites recorded as having man-made changes to hydraulic conditions as an issue or risk adversely affecting (or having the potential to adversely affect) features of that site

Data was 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.

The issue or risk is recorded by 'sub-category' e.g. Drainage, water abstraction, modified water courses; therefore the issue/risk may appear more than once per site at the site level.

Data from September 2015.

Site name	Number of instances site affected		
	Unit level	Site level	Total
Migneint-Arenig-Dduallt	38	-	38
Corsydd Mon / Anglesey Fens	29	3	32
River Dee and Bala Lake/Afon Dyfrydwy a Llyn Tegid	24	2	26
Fenn's,Whixall, Bettisfield, Wem and Cadney Mosses	22	2	24
Berwyn a Mynyddoedd De Clwyd / Berwyn and South Clwyd Mountains	20	-	20
Afon Eden-Cors Goch Trawsfynydd	15	3	18
Cors Fochno	16	2	18
Corsydd Llyn /Lleyn Fens	13	1	14
Montgomery Canal	14	-	14
Afonydd Cleddau / Cleddau Rivers	8	-	8
Carmarthen Bay Dunes/Twyni Bay Caerfyrddin	8	-	8
Cors Caron	7	1	8
Llangorse Lake / Llyn Syfaddan	6	1	7
Rhinog	7	-	7
Afon Gwyrfai a Llyn Gwellyn	5	1	6
Cernydd Carmel	6	-	6
Kenfig / Cynffig	6	-	6
Afon Teifi / River Teifi	5	-	5
Crymlyn Bog / Cors Crymlyn	5	-	5
Morfa Harlech a Morfa Dyffryn	5	-	5
Afon Tywi / River Tywi	3	1	4
Eryri / Snowdonia	4	-	4
Y Twyni o Abermenai i Aberffraw / Abermenai to Aberffraw Dunes	4	-	4
Corsydd Eifionydd	1	1	2
Glaswelltiroedd Cefn Cribwr / Cefn Cribwr Grasslands	2	-	2
Gower Commons/Tiroedd Comin Gwyr	2	-	2
Gweunydd Blaencleddau	2	-	2
River Wye / Afon Gwy	-	2	2
Severn Estuary/Mor Hafren	-	2	2

Blaen Cynon	1	-	1
Cadair Idris	1	-	1
Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd	-	1	1
Coed Y Cerrig	-	1	1
Cwm Cadlan	-	1	1
Dee Estuary / Aber Dyfrydwy	-	1	1
Granllyn	-	1	1
Johnstown Newt Sites	1	-	1
Llwyn	-	1	1
Llyn Dinam	-	1	1
Pembrokeshire Bat Sites and Bosherton Lakes/Safleoedd Ystum Sir Benf	1	-	1
Pembrokeshire Marine/Sir Benfro Forol	1	-	1
Preseli	-	1	1
Rhos Goch	1	-	1
River Usk/Afon Wysg	-	1	1
Usk Bat Sites / Safleoedd Ystumod Wysg	1	-	1
Total	284	31	315

Appendix B: Natura 2000 features recorded as being adversely affected (or having the potential to be adversely affect) by made-made changes to hydraulic conditions 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.

The issue or risk is recorded by 'sub-category' e.g. Drainage, water abstraction, modified water courses; therefore the issue/risk may appear more than once per site at the site level.

Data from September 2015.

Natura 2000 feature (common name)	Number of instances feature affected		
	Unit level	Site level	Total
Blanket Bog	69	-	69
Degraded raised bogs	43	5	48
Otter	36	8	44
Atlantic salmon	34	9	43
River lamprey	31	9	40
Calcium-rich springwater-fed fens	34	5	39
Brook lamprey	32	6	38
Bullhead	32	6	38
Calcium-rich fen dominated by great fen sedge (saw sedge)	30	4	34
Purple moor-grass meadows	29	4	33
Sea lamprey	18	9	27
Active raised bogs	17	6	23
Humid dune slacks	21	1	22
Dunes with creeping willow	19	-	19
Freshwater pearl mussel	15	3	18
Rivers with floating vegetation often dominated by water-crowfoot	14	4	18
Floating water-plantain	15	-	15
Wet heathland with cross-leaved heath	13	-	13
Calcium-rich nutrient-poor lakes, lochs and pools	10	3	13
Fen orchid	11	2	13
Petalwort	12	-	12
Very wet mires often identified by an unstable 'quaking' surface	8	1	9
Naturally nutrient-rich lakes or lochs which are often dominated by pondweed	7	2	9
Geyer's whorl snail	6	3	9
Twaite shad	3	6	9
Southern damselfly	6	2	8
Depressions on peat substrates	5	2	7
Allis shad	3	4	7

Marsh fritillary butterfly	5	-	5
Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels	4	-	4
Great crested newt	1	1	2
Intertidal mudflats and sandflats	-	2	2
Dry heaths	1	-	1
Lagoons	1	-	1
Atlantic salt meadows	-	1	1
White-clawed (or Atlantic stream) crayfish	-	1	1
Shifting dunes	-	1	1
Estuaries	-	1	1
Dune grassland	-	1	1
Reefs	-	1	1
Glasswort and other annuals colonising mud and sand	-	1	1
Subtidal sandbanks	-	1	1
Shifting dunes with marram	-	1	1