



Cynllun Gweithredu Thematig Natura 2000 Rhywogaethau a Phathogenau Estron Goresgynnol

Natura 2000 Thematic Action Plan Invasive Species and Pathogens

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:
Natural Resources Wales
Cambria House
29 Newport Road
Cardiff
CF24 0TP

0300 065 3000 (Mon-Fri, 8am - 6pm)

enquiries@naturalresourceswales.gov.uk
www.naturalresourceswales.gov.uk

© Natural Resources Wales

All rights reserved. This document may be reproduced with prior permission of
Natural Resources Wales

Contents

Acknowledgements.....	3
1. Cyflwyniad.....	4
2. Introduction.....	6
3. Background.....	8
4. Issues and risks.....	10
5. Policy and legislative context.....	13
6. Current mechanisms and planned actions on sites to 2020.....	15
7. Rationale for strategic actions.....	17
8. Development of strategic actions.....	18
9. Strategic actions for Natura 2000 in Wales: Invasive Species and Pathogens.....	19
Appendix A:.....	24
Appendix B:.....	27

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 specialists who reviewed and refined the strategic actions: Matthew Ellis, Maggie Hatton-Ellis, Tristan Hatton-Ellis, Liz Howe, Dave Thorpe, Chris Tucker and Gabe Wyn.

Thanks also to the Improvement Programme for England's Natura 2000 Sites - Planning for the Future project (IPENS) run by Natural England, which also produced a plan to address the management of invasive species on Natura 2000 sites.

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 hymrwymiaadau 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 grynodedau 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 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 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, 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

Work carried out by the LIFE Natura 2000 Programme for Wales in 2014/15 has identified invasive species and pathogens as a priority issue/risk affecting Natura 2000 features in Wales. This issue/risk is the second most frequently cited issue/risk.³ This is consistent with the most recent round of UK level biodiversity reporting; the 10th UK 'Article 12 report'⁴ and 'Article 17 report'⁵ show that invasive species are having or have the potential to have adverse impacts on the condition status of a variety of features across Special Areas of Conservation (SAC) and Special Protection Areas (SPA).

This Thematic Action Plan primarily considers invasive non-native species and pathogens, pests and diseases. Species either currently impacting or with the potential to impact on designated features on Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) in terrestrial, freshwater and marine environments are considered.

An invasive non-native species (INNS) is defined as any non-native animal or plant that has the ability to spread causing damage to the environment, the economy, our health and the way we live. Many non-native species can be regarded as colonists rather than invasive, as they do not pose a threat to native ecosystems⁶.

The terms pathogens, pests and diseases refer to significant outbreaks of either native or introduced species. Over the last two decades there has been a notable increase in the number of new disease outbreaks, including at least six *Phytophthora* species. Other examples include oak processionary moth and ash dieback.

Competitive native species with the potential to become invasive in certain circumstances, may also be included in the statistics on which this plan is based. However, these will only make up a small proportion of the total, because in general the root cause of problems such as bracken or scrub invasion is considered to be inappropriate management of grazing or water levels. Invasive native species issues are therefore, predominantly included as part of the Grazing and Livestock Management or Man-made Changes to Hydraulic Conditions Thematic Action Plans.

INNS are considered the second biggest threat to global biodiversity following habitat loss⁷. They impact biodiversity and ecosystems through consumption, resource competition, introduction of diseases, interbreeding and disturbance⁸. Whilst biosecurity

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*. JNCC, Peterborough.

⁶ Natural England 2015. *Invasive species theme plan. Strategic principles for the management of invasive species on Natura 2000 sites*.

⁷ DEFRA 2008. *The invasive non-native species framework strategy for Great Britain: Protecting our natural heritage from invasive species*. Department for Environment Food and Rural Affairs.

⁸ Wittenberg, R. and Cock, M.J.W. (eds.) 2001. *Invasive Alien Species: A Toolkit of Best Prevention and Management Practices*. CAB International, Wallingford, Oxon, UK, xvii - 228.

measures to prevent INNS reaching all environments are important, they are particularly crucial for marine areas, where control techniques are far harder to implement effectively.

In 2008, Defra published a Framework Strategy for invasive non-native species in Great Britain, with the aim of addressing key weaknesses in our capacity to respond to the threats posed by INNS; this was re-published in 2015⁹. It provides a more coordinated and structured approach to deal with INNS than had previously existed, and should be regarded as the umbrella framework under which this Thematic Action Plan (with its specific remit of Natura 2000 sites) sits. Responsibility for driving the implementation of the framework strategy sits with central UK government via Defra, Welsh Government and the Scottish Government. There is a key role within the strategy for government bodies such as the statutory conservation bodies and JNCC. Coordination with key Non-Governmental Organisations (NGOs), landowners and interest groups is also integral to the requirement of the Framework.

⁹ DEFRA 2015. *The Great Britain Non Native Species Strategy*.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/455526/gb-non-native-species-strategy-pb14324.pdf Accessed 17/09/2015.

4. Issues and risks

The LIFE Natura 2000 Programme data shows that invasive species and pathogens have (or are likely to have in the near future) an impact on 71 out of 123 (58%) Natura 2000 habitat or species features, on 84 out of 112 (75%) Natura 2000 sites in Wales.

433 invasive species and pathogen issues and risks were recorded across the Natura 2000 series (on individual units or on whole sites), out of a total of 3,090 records (for all types of issue and risk) (14%).

The issues and risks arising from invasive species and pathogens are related to a decrease in biodiversity through competition for resources and in the case of pathogens, damage to and mortality of host organisms. Table 1 below shows the features most frequently affected by invasive species and pathogens, as identified by Programme data from the NRW Actions Database and Prioritised Improvement Plans (PIPs). A full list of affected sites and features is shown in Appendices A and B respectively.

Woodland SACs including Alyn Valley Woods, Meirionnydd Oakwoods and Bat Sites and North Pembrokeshire Woodlands have high numbers of issues and risks associated with invading rhododendron, Japanese knotweed, Himalayan balsam and conifers, as well as bracken. These species can spread rapidly through undergrowth, causing impoverishment of flora and fauna in the ground and shrub layer in a range of woodland habitat types. Woodland features are also at risk from *Phytophthora*, a fungus-based pathogen which can cause significant damage to woodland ecosystems.

Invasive species and pathogens are also commonly noted as a problem in the PIPs for upland sites including Berwyn a Mynyddoedd De Clwyd SAC, Cadair Idris SAC, Elenydd-Mallaen SPA and Eryri SAC. This tends to be due to bracken spread and rhododendron and conifers seeding into a range of upland feature types including dry and wet heath and bog habitats (blanket bog, degraded raised bog and active raised bog) which results in scrub growth and a degradation of features if left untreated. Some heath species such as *Vaccinium* spp. are also at risk from *Phytophthora* species.

Freshwater dependent features including rivers and lakes, bog systems, otters, newts and fish species are often impacted by invasive species spread via watercourses. Deeside and Buckley Newt Sites SAC, Johnstown Newt Sites SAC, Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses SAC and Afon Teifi SAC have *Crassula*, Japanese knotweed and Himalayan balsam as the main species noted in the PIPs as requiring action.

Features on coastal SACs such as Carmarthen Bay Dunes, Morfa Harlech a Morfa Dyffryn, Clogwyni Pen Llyn and Kenfig are commonly affected by invasive species seeding in such as conifers, sea buckthorn and buddleia in dune and salt meadow habitats and Himalayan balsam, cotoneaster and bracken on vegetated sea cliff features.

Marine features across all marine sites have the potential to be impacted by the rapid spread of invasive species and pathogens. For instance *Didemnum vexillum* is a known invasive sea squirt currently found close to Y Fenai a Bae Conwy SAC, which could be transferred to marine features via existing pathways, which would have potentially significant negative impacts. In Pembrokeshire Marine SAC, Slipper Limpet is impacting

on several features: reefs; mudflats and sandflats; estuaries and large shallow inlets and bays.

While the frequency of issues and risks appears low on marine sites this reflects the fact that there are a small number of large marine sites in Wales and that issues and risks were mainly identified at the site level. For example the estuary feature (in Table 1) has only been identified as having seven instances where the feature is being affected, however, there are only seven estuaries designated in Wales so this represents 100% of the feature in Welsh waters.

Table 1. List of features most frequently identified as having impacts arising from invasive species and pathogens in the LIFE Natura 2000 Programme data

Natura 2000 feature (common name)	Number of instances feature affected*		
	Unit level	Site level	Total
Dry heaths	75	17	92
Mixed woodland on base-rich soils associated with rocky slopes	61	15	76
Western acidic oak woodland	46	12	58
Great crested newt	23	13	36
Dry grasslands and scrublands or chalk or limestone	26	3	29
Alluvial forests	15	11	26
Blanket bog	18	3	21
Humid dune slacks	14	4	18
Rivers with floating vegetation often dominated by water-crowfoot	7	11	18
Degraded raised bogs	14	3	17
Atlantic salmon	7	10	17
Purple moor-grass meadows	10	6	16
Dunes with creeping willow	14	1	15
Dune grassland	12	3	15
Vegetated sea cliffs	12	2	14
River lamprey	2	11	13
Otter	6	6	12
Grasslands on soils rich in heavy metals	10	1	11
Shifting dunes with marram	10	1	11
Wet heathland with cross-leaved heath	7	4	11
Brook lamprey	1	9	10
Sea lamprey	1	9	10
Reefs	5	4	9
Intertidal mudflats and sandflats	3	6	9
Atlantic salt meadows	2	7	9
Naturally nutrient-rich lakes or lochs which are often dominated by pondweed	6	2	8
Bullhead	1	7	8
Beech forests on neutral to rich soils	5	2	7
Active raised bogs	1	6	7
Allis shad	1	6	7
Twaite shad	1	6	7
Estuaries	-	7	7

**The 'number of instances' indicates the number of times invasive species and pathogens are 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 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.

See Appendix B for a full list of features affected.

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 impacts upon the issue of invasive species and pathogens are as follows:-

International and European

- The Aichi Biodiversity Targets from the Convention on Biological Diversity Strategic Plan for Biodiversity 2011 – 2020 address invasive non-native species: **Target 9:** *By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.*
- **EU Invasive Alien Species (IAS) Regulation:** The regulation came into force on 1 January 2015, after which the European Commission has a further 12 months to propose a statutory list of species to which the regulation will apply. Member states will then have between 1-3 years to put in place the required measures. The species on the list will be subject to risk assessments and action plans; member states will be required to have surveillance and control procedures in place such that if/when a species arrives it can be detected and quickly assessed for feasibility of control. If control is feasible it has to be started within three months of the species having been detected. In addition, for widespread and non-controllable species there is a requirement to have management plans in place.
- **Water Framework Directive (WFD):** In the WFD, the EU has established a framework for the protection of inland surface waters, groundwater, transitional waters and coastal waters across Europe. The WFD has a number of objectives, such as preventing and reducing pollution, promoting sustainable water usage and environmental protection. A key element of achieving its ultimate aim of 'good ecological and chemical status' is the control of invasive species. A technical sub-group has been established (UK TAG Alien Species Group) which uses evidence to categorise invasive non-native species in relation to their impact and risk.
- **Marine Strategy Framework Directive (MSFD):** There are targets in the MSFD to reduce the introduction and spread of INNS through pathways management, surveillance of new introductions and development of action plans. The directive requires member states to work together to deliver good environmental status. The Marine Pathways Steering Group comprising of members from UK and Ireland provides technical advice on marine invasive species.

Domestic

- **Wildlife and Countryside Act 1981:** The WCA makes a number of provisions relating to invasive non-native species; primarily Section 14 which makes it an offence to release or allow to escape into the wild any animal or plant not ordinarily resident or listed on Schedule 9 of the Act. Natural Resources Wales has a duty to regulate the release of non-native species through the licensing regime.
- **GB Framework Strategy for Invasive Non-native Species:** Originally published by Defra in 2008, the strategy was reviewed and a new strategy and action plan issued in August 2015¹⁰. In Wales this strategy and action plan is delivered through the Wales Biodiversity Partnership INNS expert group chaired by Welsh Government¹¹. Under the strategy Welsh Government may request Natural Resources Wales to be the coordinating body for a rapid response against a newly arrived invasive species where the impact is solely/mainly on a designated site or the main impact is on biodiversity.
- **Species Control Agreements and Control Orders:** Section 23 of the Infrastructure Act 2015 which received Royal Assent on 12 February 2015, amends the Wildlife and Countryside Act 1981 by inserting a new Schedule 9A to introduce a new statutory regime of species control agreements and orders to ensure that landowners take action on invasive non-native species or permit others to enter the land and carry out those operations. The powers enable the Welsh Ministers or Natural Resources Wales to set up species control agreements with landowners on whose land invasive species are found, or species control orders where: owners fail to comply with a species control agreement they have entered into; owners refuse to enter an agreement that has been offered; in cases of urgent necessity; and where no landowner can be identified. Failure to comply with a species control order, without reasonable excuse, constitutes an offence.

Additional legislation relevant to invasive species and pathogens

Section 50¹² and 51¹³ of the Natural Environment and Rural Communities Act in respect of the sale of and Codes of Practice in connection with invasive non-native species.

Community Protection Notices issued under the Anti-Social Behaviour, Crime and Policing Act 2014, The Civil Contingencies Act 2004¹⁴ and the Environmental Damage (Prevention and Remediation) Wales Regulations 2009.

Import of Live Fish (England and Wales) Act 1980 controls the release of certain fish and shellfish species as do the Aquaculture Regulations¹⁵.

¹⁰ DEFRA 2015. *The Great Britain Non Native Species Strategy*.

¹¹ WBP INNS Group - <http://www.biodiversitywales.org.uk/Invasive-Non-Native-Group>

¹² Section 50. Sale etc. of invasive non-native species under The Natural Environment and Rural Communities Act 2006

¹³ Section 51. Codes of practice in connection with invasive non-native species under Natural Environment and Rural Communities Act 2006

¹⁴ The Civil Contingencies Act 2004 defines the meaning of an emergency under Section (1) (b) an event or situation threatens damage to the environment only if it involves, causes or may cause (a) contamination of land, water or air with biological, chemical or radio-active matter, or (b) disruption or destruction of plant life or animal life.

¹⁵ GB Non Native Species Secretariat 2015. <http://www.nonnativespecies.org/index.cfm?sectionid=23>

6. Current mechanisms and planned actions on sites to 2020

The LIFE Natura 2000 Programme identified and costed actions to address issues/risks relating to invasive species and pathogens 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.

Actions, expressed in terms of the delivery mechanism, are shown below in Table 2. This 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.

Table 2. Mechanisms identified in the LIFE Natura 2000 Programme data to address issues and risks associated with invasive species and pathogens on SACs and SPAs in Wales.

Mechanism	Total number of instances of mechanism	Total cost*	Total NRW staff days*
Direct management	225	£9,421,000	774
NRW Management agreement	136	£2,276,000	1002
Investigation	122	£408,000	437
Risk surveillance	54	£130,000	143
Biosecurity measures	31	£464,000	254
Targeted education, awareness raising and liaison	8	£12,000	28
Review Forest Design/Resource Plan	2	£14,000	30
Changes to policy and/or legislation	2	£0	10
Develop/review NRW policy and recommendations	2	£0	210
New disease and pathogen management plan	1	£0	0
Total	583	£12,725,000	2,888

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

The analysis shows that there is quite a wide range of mechanisms and delivery tools are in use or planned to be used. Some of the actions link to strategies and plans such as the GB INNS Framework and the *Phytophthora ramorum* Recovery Programme, for example, actions relating to biosecurity measures and investigation/surveillance while others are, site specific; the vast majority of actions are eradication or control of species on the ground.

The dominant actions/mechanisms are described in more detail below:

- **Direct management** is the most frequently cited mechanism which could be used to limit further spread of invasive species and pathogens. It generally refers to on the ground control works and could be a one-off action to eradicate a particular

species in a defined area or it could be part of an ongoing programme of activity such as that described in the rhododendron strategy in Snowdonia. Financial costs mostly relate to contractor time.

- **Management agreement** are agreements between NRW and an owner or occupier of private land within a SAC or SPA, whereby the owner/occupier agrees to carry out specific works, in this case generally control of invasive species, with funding provided by NRW.
- **Investigation/risk surveillance.** PIPs show that in many cases where invasive species have been observed as having an impact on Natura 2000 features, systematic mapping or other investigation is necessary before appropriate treatment works can be instigated. Regular monitoring and surveillance of features may be required in order to ensure that quick action can be taken if diseases or invasive species are found.
- **Biosecurity measures** tend to be part of a site plan and cover measures to manage vectors and pathways to avoid spread of an invasive species or pathogen. This mechanism is frequently cited for marine SACs, since containment and control of invasive species within the marine environment is particularly complicated.
- **Awareness raising and education** includes activities to educate and inform people about the way particular activities can spread invasive species and pathogens and also ways to reduce these impacts. There are often strong links to biosecurity actions. Actions could include the development and implementation of a code of conduct such as the 'Check, Clean, Dry Campaign' or engagement with local communities about risk activities and how to avoid spreading invasive species.
- **Developing/reviewing plans and policy** relates to the need to update or revise a relevant plan or policy in order to limit the spread of invasive species and pathogens or plan treatment works. The nature of spread of invasive species and pathogens means that these may often be multi-site or regional plan, which consider pathways of spread and sustainable patterns of eradication.

7. Rationale for strategic actions

Whilst some actions identified in the PIPs/Actions Database are part of a wider project to control invasive species or disease at a landscape-scale, many are focused on the specific needs of an individual site.

This can have practical advantages, for example, site managers often have detailed knowledge about the requirements of the site and the best way to control invasives in that context and can control work on their own holdings and build productive relationships with neighbours. Many organisations have responsibilities for, or are involved with, managing invasive species, so multiple funding streams can be mobilised.

However, to be effective, biosecurity and control action must be collaborative, coordinated and strategic, acting in the wider environment as well as within protected sites. This is the basis for the actions identified in the 'Strategic Actions' table in Section 9 of this plan.

Five overarching principles are proposed for strategic action relating to invasive species and pathogens affecting Natura 2000 sites:

- a) Consider Natura 2000 sites in a wider context
- b) Follow the 'hierarchy of approaches' laid out in the Convention on Biological Diversity and the GB Invasive Non-native Species Strategy, that is:
 - Prevention
 - Early detection & rapid response
 - Control or mitigate impacts¹⁶
- c) Prioritise Natura 2000 requirements
- d) Move towards a strategic, proactive approach
- e) Adhere to international protocols

This approach should facilitate access to larger-scale funding and stimulate partnership working in this area.

¹⁶ Convention on Biological Diversity. <https://www.cbd.int/invasive/background.shtml>. Accessed 20/09/2015.

8. Development of strategic actions

The table in Section 9 describes the strategic actions which would be required to manage and address impacts from invasive species and pathogens on Natura 2000 features. It is anticipated that the strategic actions set out will be used to guide future work programmes.

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 a series of workshops on marine, woodlands, wetlands, rivers and lake habitats held between October 2014 and July 2015. These workshops involved a number of specialists predominantly from Natural Resources Wales representing the management of Natura 2000 features across Wales.

Participants were asked to consider existing management methods for invasive species and pathogens and to identify new strategic actions which could address impacts across a number of sites or at a Welsh or UK level. These contributions were then reviewed in July 2015 by a small working group composed of technical habitat specialists and invasive species specialists.

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. Feedback on the strategic actions 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. 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. Welsh Government and Natural Resources Wales lead on the majority of the actions, reflecting their position and role within the Great Britain Invasive Non-Native Species Strategy (GB INNS). Links between the Strategic Actions and actions in the GB INNS Implementation Plan or other existing work programmes or strategies are clearly shown, which will help facilitate and strengthen commitment to these actions.

9. Strategic actions for Natura 2000 in Wales: Invasive Species and Pathogens

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

The actions are intended to integrate with existing work to support the implementation of relevant legislation in order to improve the co-ordination of measures and create stronger controls on pathways of entry for the invasive species most likely to damage the Natura 2000 network. Relevant legislation and policy is cross-referenced in the table and includes:

GB Invasive Non Native Strategy (GB INNS) including Implementation Plan Actions; EU Regulation on Invasive Alien Species (EU IAS); Marine Strategy Framework Directive (MSFD); Water Framework Directive (WFD); Improvement Programme for England's Natura 2000 Sites (IPENS) Priority Actions for Invasive Species.

STRATEGIC ACTIONS – GENERAL (marine, freshwater and terrestrial)

Action	Detail	Priority	Links to other priority actions	Link to existing work programmes	Proposed lead organisation	Potential partner organisation(s)	Estimated cost (£)	Proposed timetable
1.1	Develop and promote adoption of codes of conduct and biosecurity initiatives, and raise awareness of impacts of Invasive Non-native Species (INNS) across marine, terrestrial and freshwater N2K features in Wales.	High	GB INNS actions: 5.4, 6.1, 6.2, 6.3 and 6.9 IPENS Priority Actions: 9, 13, 18 and 19	Marine Pathways Project outputs Green Blue 'Check Clean Dry' initiative Could be a possible LIFE bid on INNS communication in England and Wales (combining with Natural England) Bilingual biosecurity e-learning resource Be Plant Wise NRW woodland disease training	Welsh Government	Natural Resources Wales Local Authorities The Green Blue (Royal Yachting Association and British Marina Federation) Port Authorities Aquaculture operators CEFAS Canoe Wales Environment Agency Natural England Defra GB INSS Retailers and Trade Associations Wales Biodiversity Partnership (WBP) INNS working group Third sector National Park Authorities	£500,000	Complete by 2020

1.2	Integrate biosecurity best practice into appropriate regulatory regimes, to ensure that risks to N2K features posed by INNS are effectively managed.	Produce biosecurity planning guidance to inform regulatory regimes including Town and Country Planning Act development planning guidance, marine licences (developments and dredge disposal), fisheries regulation (e.g. control of deposit orders and general fisheries licences) and Habitats Regulations Assessment (HRA) and Supplementary Planning Guidance (SPGs).	High		NRW Wildlife and Countryside Act Schedule 9 Advice NRW Planning Guidance (internal and external) NRW currently updating the Scottish biosecurity guidance for the marine sector	Natural Resources Wales Welsh Government	Local authorities NRW Species Licensing Team and Marine Licencing Team Welsh Government Local Records Centres National Park Authorities	Staff time	Already underway for marine Complete by 2018
1.3	Support research into effective control and eradication methods for INNS (marine, terrestrial and freshwater) with significant impacts on N2K.	Promote the adoption of invasive species research as a priority work area for key funders such as NERC. Work with academic partners and industry to develop innovative control measures for priority INNS. Research effectiveness of differential candidate herbivores, pathogens and parasites of INNS that could act as biological control agents, such as <i>Stenopelmus weevils (Azolla)</i> , <i>Aphalara itadori</i> psyllids (Japanese knotweed) and a rust fungus (Himalayan balsam). Research the invasion pathways of key INNS in the context of industry practice, in order that more effective policy, best practice guidance and/or regulatory measures to slow or prevent the spread of INNS can be developed.	High	GB INNS actions: 8.2, 8.4	CABI's research into rust fungus for Himalayan Balsam control Pearls in Peril project Small business research initiative (INNS initiative)	Welsh Government	DEFRA: NERC/CEH Centre for Agriculture and Bioscience International (CABI) Forest Research GB INNS Universities	£150,000	Ongoing
1.4	Ensure that NRW is in a position to make use of Species Control Orders and Species Control Agreements (Infrastructure Act 2015), and that local councils and the police use Community Protection Notices (Anti-Social Behaviour, Crime and Policing Act 2014) to help facilitate control of invasive species.	Undertake staff training where required. Target species with a wider eradication programme underway. Complete Species Control Orders and Agreements code of conduct currently being drawn up, for use in Wales. Liaise with the Chartered Institute of Environmental Health regarding guidance in respect of Community Protection Notices.	High	IPENS Priority Actions: 16		Welsh Government	Natural Resources Wales Police (Wildlife Liaison Officers) Local authorities Farming unions and landowners	Staff time	2016-17

1.5	Develop a sensitivity matrix for assessing impacts of INNS on N2K feature condition to prioritise action.	Carry out a desk top study to develop a matrix to assess feature sensitivity against different invasive species to prioritise action for N2K habitats and species.	Medium	IPENS Priority Actions: 4	WFD: UK TAG Alien Species Group for freshwater and marine species GB Non-Natives Species Secretariat Risk Assessments MSFD Monitoring and Surveillance Lists/SAC Monitoring Nationally Significant Infrastructure Projects Horizon Scanning List National Biodiversity Network recording portals	Natural Resources Wales	Welsh Government DEFRA JNCC NERC/CEH Marine Pathways Steering Group Marine Biological Association (MBA) Universities Consultants WBP INNS working group Local biodiversity partnerships Local Records Centres	£150,000	Phased delivery: marine 2017, freshwater 2018, terrestrial 2019
1.6	Reduce the risk of spread of INNS to N2K sites by developing pathway management plans, focusing effort based on significance of the pathway, location of hotspots and key areas of spread, and areas most likely to be affected (e.g. sensitive habitats)		Medium	GB INNS actions: 5.4 and 7.5 IPENS Priority Actions: 10	MSFD Invasive Alien Species Regulation GB INNS Strategy IPENS evidence project	Welsh Government	Natural Resources Wales Relevant stakeholders including academia, local authorities etc.	Costs from MFSD and IAS reg and GB INNS strategy	2020
1.7	Integrate N2K habitat and species needs and priorities and the impact of INNS on them into relevant Wales and UK strategies and standards.	For example the Biodiversity Strategy, Natura Recovery Plan, Woodlands Strategy, UK Forestry Standards, WFD actions, Grey Squirrel Strategy, Rhododendron Strategy.	Medium			Welsh Government	Natural Resources Wales WBP INNS working group Snowdonia National Park Authority	Staff time	As strategies are produced /revised

* this refers to the 2011 guidance for ships (<http://www.uscg.mil/imo/mepc/docs/MEPC%2062-24-Add.1.pdf>) and the 2012 guidance for recreational vessels (<http://www.imo.org/en/OurWork/Environment/Biofouling/Documents/MEPC.1-Circ.792.pdf>)

STRATEGIC ACTIONS – FRESHWATER AND TERRESTRIAL

	Action	Detail	Priority	Links to other priority actions	Link to existing work programmes	Proposed lead organisation	Potential partner organisation(s)	Estimated cost (£)	Proposed timetable
2.1	Produce area-based long term management plans for INNS eradication/control for N2K sites at particular risk of INNS.	Plans may be for groups of sites. Plans should be fully costed, suggest potential funding sources and be in line with GB INNS strategy.	High	GB INNS actions: 5.4 IPENS Priority Actions: 10	N2K core management plans NRW S.15 Management Agreements Glastir NNR work programme	Natural Resources Wales	Welsh Government Wildlife Trusts National Trust RSPB WBP National Park Authorities Local Authorities	Staff time	2020
2.2	Implement and support existing and new projects/initiatives in support of area-based management plans for INNS eradication/control for N2K sites (see action 2.1 above).	e.g. Dee INNS project, Afon Gwyrfai project. Make sure these are cost effective by linking to other benefits i.e. socio-economic. Note these projects might be short-term but contribute to a longer term plan (action 2.1).	High		Could be a possible LIFE bid on INNS in Wales. Tidy Towns-Himalayan Balsam, National Trust-rhododendron bashing	Catchment relevant	Natural Resources Wales National Trust RSPB Wildlife Trusts Woodland Trust WBP Farming Unions Game and Wildlife Conservation Trust Country Land and Business Association National Park Authorities Local Authorities	£200,000	2020
2.3	Influence future agri-environment schemes to better deliver targeted management of INNS.	Investigate Glastir Monitoring and Evaluation Programme for outcomes with respect to INNS.	Medium		Glastir	Welsh Government	Natural Resources Wales FWAG	Staff time	According to timetable for new agri-environment schemes

STRATEGIC ACTIONS – MARINE

	Action	Detail	Priority	Links to other priority actions	Link to existing work programmes	Proposed lead organisation	Potential partner organisation(s)	Estimated cost (£)	Proposed timetable
3.1	Investigate pathways and vectors of spread of INNS within N2K sites to underpin the development of Site and Network Action Plans (see action 3.2. below).	<p>Gather evidence on the presence and distribution of invasive non-natives species within sites, and the activities associated with the vectors of spread. There would also be a need to investigate pathways to and from each site, including from high risk areas adjacent to the site.</p> <p>Could be part of a possible LIFE bid on Marine INNS Pathway Management in Wales</p>	High	<p>GB INNS actions: 3.3 and 5.4</p> <p>IPENS Priority Actions: 10</p>	<p>Measures and monitoring being developed under MSFD (Descriptor 2) and WFD</p> <p>SAC monitoring and reporting</p> <p>Development planning statutory consultations</p>	Natural Resources Wales	<p>Welsh Government</p> <p>DEFRA</p> <p>Marine Pathways Steering Group</p> <p>RAGs</p> <p>Universities</p> <p>Consultants</p>	£50,000	2018
3.2	Develop N2K Site and Network Action Plans (including pathways actions and species actions) for all marine N2K sites, using baseline evidence developed in action 3.1.	<p>Could be part of a possible LIFE Bid on Marine INNS Pathway Management in Wales.</p>	High	<p>GB INNS actions: 5.4</p> <p>IPENS Priority Actions: 10</p>	<p>Measures and monitoring being developed under MSFD (Descriptor 2) and WFD</p> <p>SAC monitoring and reporting.</p> <p>Development planning statutory consultations</p>	Natural Resources Wales	<p>Welsh Government</p> <p>DEFRA</p> <p>Marine Pathways Steering Group</p> <p>Universities</p> <p>Consultants</p>	Staff time	2020

Appendix A: Natura 2000 sites recorded as having invasive species and pathogens 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 current issues and potential future 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.

Site name	SAC/SPA	Number of instances site affected		
		Unit level	Site level	Total
Berwyn a Mynyddoedd De Clwyd / Berwyn and South Clwyd Mountains	SAC	45	-	45
Alyn Valley Woods / Coedwigoedd Dyffryn Alun	SAC	33	2	35
Coedydd Derw a Safleoedd Ystumod Meirion/Meirionnydd Oakwoods and Bat sites	SAC	22	-	22
Great Orme's Head / Pen Y Gogarth	SAC	16	2	18
Johnstown Newt Sites	SAC	11	4	15
North Pembrokeshire Woodlands / Coedydd Gogledd Sir Benfro	SAC	13	1	14
Deeside & Buckley Newt Sites	SAC	10	3	13
Fenn's,Whixall, Bettisfield, Wem and Cadney Mosses	SAC	10	1	11
Cadair Idris	SAC	6	3	9
Afon Teifi / River Teifi	SAC	6	2	8
Carmarthen Bay Dunes / Twyni Bay Caerfyrddin	SAC	8	-	8
Clogwyni Pen Llyn / Seacliffs of Llyn	SAC	7	1	8
Kenfig / Cynffig	SAC	6	2	8
Coetiroedd Cwm Elan / Elan Valley Woodlands	SAC	6	1	7
Elenydd-Mallaen	SPA	6	1	7
Halkyn Mountain / Mynydd Helygain	SAC	4	3	7
Pen Llyn ar Sarnau / Llyn Peninsula and the Sarnau	SAC	5	2	7
Wye Valley Woodlands / Coetiroedd Dyffryn Gwy	SAC	6	1	7
Cernydd Carmel	SAC	5	1	6
Coedwigoedd Dyffryn Elwy / Elwy Valley Woods	SAC	4	2	6
Eryri / Snowdonia	SAC	2	4	6
Gower Ash Woods / Coedydd Ynn Gwyr	SAC	5	1	6
Grogwynion	SAC	5	1	6
Morfa Harlech a Morfa Dyffryn	SAC	6	-	6
Usk Bat Sites / Safleoedd Ystumod Wysg	SAC	4	2	6
Y Twyni o Abermenai i Aberffraw / Abermenai to Aberffraw Dunes	SAC	6	-	6
Coed Cwm Einion	SAC	3	2	5
Coedydd Aber	SAC	3	2	5
Cors Fochno	SAC	4	1	5
Corsydd Mon / Anglesey Fens	SAC	3	2	5

Dee Estuary / Aber Dyfrydwy	SAC	2	3	5
Afon Gwyrfai a Llyn Gwellyn	SAC	2	2	4
Afonydd Cleddau / Cleddau Rivers	SAC	2	2	4
Coedydd Nedd a Mellte	SAC	3	1	4
Cwm Doethie - Mynydd Mallaen	SAC	3	1	4
Glannau Ynys Gybi / Holy Island Coast	SAC	4	-	4
Gower Commons / Tiroedd Comin Gwyr	SAC	4	-	4
North West Pembrokeshire Commons / Comins Gogledd Orllewin Sir Benfro	SAC	3	1	4
Rhinog	SAC	1	3	4
River Wye / Afon Gwy	SAC	2	2	4
Afon Eden-Cors Goch Trawsfynydd	SAC	-	3	3
Blackmill Woodlands	SAC	3	-	3
Coedwigoedd Penrhyn Creuddyn / Creuddyn Peninsula Woods	SAC	1	2	3
Glannau Ynys Gybi / Holy Island Coast	SPA	3	-	3
Mwyngloddiau Fforest Gwydir / Gwydyr Forest Mines	SAC	3	-	3
River Dee and Bala Lake/Afon Dyfrydwy a Llyn Tegid	SAC	1	2	3
Afon Tywi / River Tywi	SAC	-	2	2
Blaen Cynon	SAC	2	-	2
Brecon Beacons / Bannau Brycheiniog	SAC	-	2	2
Cardiff Beech Woods	SAC	1	1	2
Coedydd a Cheunant Rheidol / Rheidol Woods and Gorge	SAC	-	2	2
Coedydd Llawr-y-glyn	SAC	2	-	2
Corsydd Eifionydd	SAC	2	-	2
Corsydd Llyn /Lleyn Fens	SAC	1	1	2
Glannau Mon:Cors heli / Anglesey Coast:Saltmarsh	SAC	1	1	2
Glan-traeth	SAC	-	2	2
Glaswelltiroedd Cefn Cribwr / Cefn Cribwr Grasslands	SAC	1	1	2
Granllyn	SAC	-	2	2
Llangorse Lake / Llyn Syfaddan	SAC	-	2	2
Llwyn	SAC	1	1	2
Migneint-Arenig-Dduallt	SAC	-	2	2
Montgomery Canal	SAC	-	2	2
Pembrokeshire Bat Sites and Bosherton Lakes / Safleoedd Ystlum Sir Benf	SAC	-	2	2
River Usk / Afon Wysg	SAC	-	2	2
Sugar Loaf Woodlands	SAC	2	-	2
Aberbargoed Grasslands	SAC	-	1	1
Cardigan Bay / Bae Ceredigion	SAC	-	1	1
Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd	SAC	-	1	1
Castlemartin Coast	SPA	-	1	1
Coed Y Cerrig	SAC	-	1	1
Cors Caron	SAC	-	1	1
Crymlyn Bog / Cors Crymlyn	SAC	-	1	1
Cwm Cadlan	SAC	1	-	1

Cwm Clydach Woodlands / Coedydd Cwm Clydach	SAC	1	-	1
Dyfi Estuary / Aber Dyfi	SPA	-	1	1
Elenydd	SAC	-	1	1
Gweunydd Blaencleddau	SAC	1	-	1
Llyn Dinam	SAC	1	-	1
Mynydd Cilan, Trwyn y Wylfa ac Ynysoedd Sant Tudwal	SPA	1	-	1
Pembrokeshire Marine / Sir Benfro Forol	SAC	-	1	1
Preseli	SAC	1	-	1
Rhos Goch	SAC	-	1	1
Severn Estuary / Mor Hafren	SAC	-	1	1
St David's / Ty Ddewi	SAC	1	-	1
Total		327	106	433

Appendix B: Natura 2000 features recorded as being adversely affected (or having the potential to be adversely affect) by invasive species and pathogens on sites

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.

Data from September 2015.

Feature (common name)	Number of instances feature affected		
	Unit level	Site level	Total
Dry heaths	75	17	92
Mixed woodland on base-rich soils associated with rocky slopes	61	15	76
Western acidic oak woodland	46	12	58
Great crested newt	23	13	36
Dry grasslands and scrublands on chalk or limestone	26	3	29
Alluvial forests	15	11	26
Blanket bog	18	3	21
Humid dune slacks	14	4	18
Rivers with floating vegetation often dominated by water-crowfoot	7	11	18
Degraded raised bogs	14	3	17
Atlantic salmon	7	10	17
Purple moor-grass meadows	10	6	16
Dunes with creeping willow	14	1	15
Dune grassland	12	3	15
Vegetated sea cliffs	12	2	14
River lamprey	2	11	13
Otter	6	6	12
Grasslands on soils rich in heavy metals	10	1	11
Shifting dunes with marram	10	1	11
Wet heathland with cross-leaved heath	7	4	11
Brook lamprey	1	9	10
Sea lamprey	1	9	10
Reefs	5	4	9
Intertidal mudflats and sandflats	3	6	9
Atlantic salt meadows	2	7	9
Naturally nutrient-rich lakes or lochs which are often dominated by pondweed	6	2	8
Bullhead	1	7	8
Beech forests on neutral to rich soils	5	2	7
Active raised bogs	1	6	7
Allis shad	1	6	7
Twaite shad	1	6	7
Estuaries	-	7	7

Peregrine	6	-	6
Lesser horseshoe bat	4	2	6
Southern damselfly	4	2	6
Marsh fritillary butterfly	3	3	6
Very wet mires often identified by an unstable 'quaking' surface	3	3	6
Petalwort	6	-	6
Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels	-	6	6
Chough	4	1	5
Shifting dunes	4	1	5
Plants in crevices in base-rich rocks	2	3	5
Shallow inlets and bays	2	3	5
Fen orchid	5	-	5
White-clawed (or Atlantic stream) crayfish	2	2	4
Yew-dominated woodland	2	2	4
Calcium-rich nutrient-poor lakes, lochs and pools	1	3	4
Calcium-rich springwater-fed fens	1	3	4
Glasswort and other annuals colonising mud and sand	-	4	4
Merlin	2	1	3
Calcium-rich fen dominated by great fen sedge (saw sedge)	0	3	3
Tall herb communities	-	3	3
Subtidal sandbanks	-	3	3
Plants in crevices on acid rocks	-	3	3
Base-rich scree	2	-	2
Red kite	2	-	2
Depressions on peat substrates	1	1	2
Floating water-plantain	2	-	2
Lagoons	-	2	2
Freshwater pearl mussel	-	2	2
Sea caves	-	2	2
Geyer`s whorl snail	-	2	2
Alpine and subalpine heaths	-	1	1
Greenland white-fronted goose	-	1	1
Bog woodland	-	1	1
Grey seal	-	1	1
Greater horseshoe bat	-	1	1
Montane acid grasslands	-	1	1
Acidic scree	-	1	1
Bottlenose dolphin	-	1	1
Desmoulin`s whorl snail	-	1	1