Yr Heriau sy'n Wynebu Cynefinoedd a Rhywogaethau Natura 2000 yng Nghymru

Challenges Facing Welsh Natura 2000 Habitats and Species

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

Adroddiad 2 / Report 2

Dadansoddiad o'r Problemau a'r Peryglon
An Analysis of Issues and Risks

2014

Contents

Crynodeb Gweithredol

Nodwyd fod yna fwy na 40 o wahanol broblemau (neu bwysau) yn amharu ar rywogaethau a chynefinoedd safleoedd Natura 2000 yng Nghymru ar hyn o bryd. Dim ond 9% o'r 119 o'r nodweddion a astudiwyd oedd heb gael eu heffeithio. Gall y problemau arwain at gynefin neu rywogaeth yn disgyn i gyflwr anffafriol ac yn eu rhwystro rhag cyrraedd statws cadwraeth ffafriol.

Mae'r rhan fwyaf o broblemau'n disgyn i'r categorïau o lygredd a gwastraff, rheoli tir amaethyddol, rheoli dŵr a rhywogaethau goresgynnol. Mae gwahanol ecosystemau'n wynebu gwahanol heriau ond mae rhai problemau megis pori amhriodol, llygredd dŵr gwasgaredig ac yn y ffynhonnell, rhywogaethau anfrodorol goresgynnol a llygredd aer yn codi yn y rhan fwyaf o'r categoriau ac felly'n dylanwadu'n eithaf trwm ar draws y gyfres Natura 2000 yng Nghymru.

Mae'r peryglon (neu fygythiadau) a allai godi yn y dyfodol yn cynnwys ffactorau sy'n bryder cynyddol megis newid hinsawdd, llygredd gan fiosidau a hormonau, achosion o afiechydon a datblygiadau ynni amhriodol. Mae gollyngiadau mawr o olew yn y môr neu ddigwyddiadau tebyg yn dal yn gallu bod yn berygl mawr, yn enwedig i adar y môr. Mae llawer o broblemau heddiw hefyd yn cael eu dangos fel peryglon yn y dyfodol, sy'n dangos y gallen nhw ddatblygu'n fwy dwys neu'n fwy o faint.

Canlyniadau yw'r rhain o ganfyddiadau astudiaeth o'r ffynonellau gwybodaeth presennol (yn bennaf Basdata Gweithrediadau Cyfoeth Naturiol Cymru) ac adolygiad barn rhanddeiliaid sydd â rhan mewn rheoli safleoedd Natura 2000.

Roedd cyfyngiadau ar y ffynhonnell ddata, sy'n cael eu crybwyll yn yr adroddiad, felly dylid cymryd y canlyniadau fel arweiniad yn hytrach nag fel dadansoddiad diffiniol. Nid y canfyddiadau a ddisgrifir yn yr adroddiad ar hyn o bryd yw'r blaenoriaethau a gytunwyd ar gyfer gweithredu cyfres Natura 2000 yng Nghymru.

Cynhaliwyd yr astudiaeth fel rhan o Raglen Natura 2000 LIFE yng Nghymru, sy'n cael ei hariannu ar y cyd gan Cyfoeth Naturiol Cymru a chynllun Natur LIFE+ yr Undeb Ewropeaidd.

Executive Summary

Over 40 different issues (or pressures) have been identified as currently having an adverse impact upon the species and habitats of Natura 2000 sites in Wales. Only 9% of the 119 features studied were unaffected. These issues can result in the habitat or species falling into unfavourable condition and act as barriers to achieving favourable conservation status.

The majority of the issues fall within the categories of pollution and waste, agricultural land management, water management and invasive species. Different ecosystems face different challenges but certain issues such as inappropriate grazing, diffuse and point source water pollution, invasive non-native species and air pollution are cross-cutting and therefore have a particularly significant impact across the Welsh Natura 2000 series.

Future potential risks (or threats) include factors which are of growing concern such as climate change, pollution by biocides and hormones, disease outbreaks and inappropriate energy developments. A major oil spill at sea or similar incident remains a major risk, particularly for seabirds. Many of the existing issues are also identified as future risks, indicating that their intensity or extent may increase.

These results are the findings of a study of existing data sources (primarily the Natural Resources Wales Actions Database) and a review of the opinions of stakeholders with an involvement in the management of Natura 2000 sites.

The data sources were subject to limitations as outlined in the report, so the results should be taken as a guide rather than a definitive analysis. The findings described in this report do not at this stage, represent agreed priorities for action for the Natura 2000 series in Wales.

The study was carried out as part of the LIFE Natura 2000 Programme for Wales, which is co-funded by Natural Resources Wales and EU LIFE+ Nature.

1. Introduction

The Natura 2000 network is a cornerstone of nature conservation in Wales and across Europe. However, it faces considerable challenges from both human and natural pressures and threats, and around two thirds of designated species and habitats (features) on Natura 2000 sites are in unfavourable condition.

In 2013, the LIFE Natura 2000 Programme for Wales undertook research to identify the issues (pressures) that are currently adversely affecting Natura 2000 feature and those factors which are likely to be a risk (or threat) in the future. It determined those issues and risks which are having the most widespread and profound impact across Wales.

The information will be used to deliver improved management and restoration of Natura 2000 by addressing the challenges in a strategic way; identifying priorities, and targeting resources at those activities which will solve the most significant problems. In particular, it will be used to inform the development of Prioritised Improvement Plans for individual Natura 2000 sites and Thematic Action Plans for key issues and risks.

1.1   LIFE Natura 2000 Programme

The LIFE Natura 2000 Programme is a project to develop a strategic forward plan to manage and restore Natura 2000 species, habitats and sites in Wales. Working with major stakeholders and their representatives, the programme will determine the key challenges facing these European protected sites, and identify the actions required, priorities, costs and funding opportunities to address them.

The Programme is run by Natural Resources for Wales and funded by the European Union scheme LIFE+ Nature. For full details see Natura 2000 in Wales: Facts and Figures, LIFE Natura 2000 Programme for Wales: Report 1.

1.2   Natura 2000 in Wales

There are 121 designated Natura 2000 habitat and species features on the 92 Special Areas of Conservation and 20 Special Protection Areas in Wales. These are described in full in Natura 2000 in Wales: Facts and Figures, LIFE Natura 2000 Programme for Wales: Report 1.

1.3   Method

The study covered 98% of species and habitat features on Natura 2000 sites across Wales. Information on issues and risks affecting the features was sourced from the Natural Resources Wales Actions Database (primarily), the Habitats Directive Article 17 reporting and elsewhere. Findings were analysed on a feature-by-feature basis and collated into broader groupings. The analysis was supplemented and validated

by drawing on expert opinion from representatives of stakeholder organisations at a series of workshops held in June 2013.

Results from the data analysis and the stakeholder workshops were combined to reflect both aspects and collated to identify the most prominent issues and risks for each feature group for all of Wales. The method is described in full in Appendix A.

1.4 Definitions

Feature: Habitat or species hosted by a Natura 2000 site, designated under the Habitats or Birds Directive.

Issue: A factor that needs to be addressed as it is preventing the achievement of Natura 2000 habitat or species conservation objectives. (Defined as a 'pressure' in Habitats Directive Article 17 and Birds Directive Article 12 reporting).

Risk: A factor that is considered likely to become an issue in the near future unless action is taken. (Defined as a 'threat' in Habitats Directive Article 17 and Birds Directive Article 12 reporting.)

Unit: Management unit within a Natura 2000 site, defined for management and planning purposes, delineated for example by land ownership, River Basin Management Plan water body, or feature extent.

Actions Database: A database hosted by Natural Resource Wales', to share information about actions required to address conservation management issues and develop work programmes on all designated sites in Wales.

Classification of Features

Information was available for 119 features which were classified as shown in the table below. Unless otherwise stated, the species feature is include in the Feature Type of the habitat in which it occurs e.g. Southern damselfly is classified under the Wetland Feature Type. Full details are shown in Appendix B.

Feature Grouping	Feature Type (species & habitats)	No of features	Total
SAC terrestrial features Annex I habitats & related Annex II species	Woodland	6	
	Temperate heath & scrub	3	
	Natural & semi-natural grassland	7	
	Coastal sand dunes	10	
	Rocky habitats & caves	5	**31**
SAC freshwater and wetland features Annex I habitats & related Annex II species	Riverine	12	
	Wetland	15	
	Standing water	6	
	Great crested newt	1	**34**
SAC marine features (including estuarine) Annex I habitats & related Annex II species	Marine habitats	10	
	Marine species	9	**19**
SPA bird features Annex 1 & regularly occurring migratory species	Upland birds	5	
	Marine birds	12	
	Estuarine birds	14	
	Coastal birds	1	**32**
SAC bat features Annex II species	Bats	3	**3**
			119

2. Prominent Issues Adversely Affecting Natura 2000 in Wales

2.1 Data and Method Limitations

The primary source (Natural Resources Wales Actions Database) offers data derived from conservation officers responsible for a given Natura 2000 site and covers all sites at a management unit level[1]. Some issues are better recorded than others, for example, the data for the terrestrial and freshwater and wetland features was generally extensive and of high quality, however, data for marine and bird features was less comprehensive.

Historically, climate change, habitat fragmentation and issues related to regulated development have not been included in the Actions Database. In addition, sea fisheries issues were excluded, as they were undergoing a major review at the time of data collection. These, issues are therefore under-represented in the Actions Database analysis, however, they were highlighted as dominant issue in the stakeholder workshops.

Issue data presented as frequency of occurrence will not signify the severity or extent of the issue at an individual site level.

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[1] Management units, are defined areas within a designated site, based on land ownership, management or ecological factors.

There was a high level of expertise in the workshops, however, the information produced was largely qualitative. The process of collating data into a single all-Wales view involved amalgamating data of different formats and a degree of interpretation.

Further information on limitations is shown in Appendix A.

2.2 Limitations on Use

Because of the limitations described in 1.5 and Appendix A (section 1), the results (particularly the ranking of the issues) should be used as an indicative guide to the prominence of the issue, rather than a full and comprehensive analysis.[2]

The prominent issues reflect the finding of the study only and, at this stage, do not represent agreed priorities for action for the Natura 2000 series in Wales. Prioritisation is considered under other outputs of the LIFE Natura 2000 Programme.

2.3 Prominent Issues

The most prominent issues identified for Welsh Natura 2000 features are shown in the table overleaf.

Prominence has been quantified in two ways; the 'Occurrence on units' column shows the number of times the issues is cited in the Actions Database as adversely affecting a feature on a management unit, as determined by the initial data analysis.[3] The 'Combined Score' column incorporates the stakeholders' opinion of importance. It represents the sum of the 'Occurrence on units' figure and the ranking of issues derived from the workshops.

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[2] For example, while it is fair to say that diffuse water pollution (ranked 3) and invasive non-natives (ranked 4) are both issues of high importance for the Welsh Natura 2000 series, it is not reliable to infer that diffuse water pollution is a significantly more important issue than invasive non-natives.

[3] Figures are calculated using the ten most prominent issues for each feature type, rather than all issues.

	Issue	Includes	Occurr-ences on units	Combin-ed score
1	Grazing	Over-grazing, under-grazing, inappropriate type and/or timing	2447	3512
2	Air pollution		1760	2437
3	Water pollution - diffuse source		1757	2400
4	Invasive non-native species	Terrestrial, freshwater and marine species	1052	2045
5	Water pollution - discharges/point source		1405	1815
6	Man-made changes to hydraulic conditions	Drainage, dredging, ditch management, water levels, water abstraction, weirs and other in-channel structures, riverine flood defence and erosion control, canalisation other morphological modifications etc	1269	1699
7	Access, outdoor sports, leisure and recreational activities	Erosion, disturbance, damage, inappropriate vehicle use, boats	480	1159
8	Solid waste: fly-tipping, litter, dumping spoil, sludge etc and soil pollution	Includes marine litter, port waste (refuse and litter)	592	892
9	Coastal flood defence and erosion control (squeeze)		495	815
10	Coastal processes and sediment supply		375	715
11	Ecological succession inc scrub invasion		267	714
12	Woodland and plantation management and use	Inappropriate tree felling and management tree planting, insufficient tree management	217	687
13	Mowing/cutting of grassland or heathland		204	630
14	Fire and fire suppression	Deliberate or accidental	224	524
15	Invasive/problematic native species		131	369
16	Freshwater fisheries	Stocking, angling, fisheries management	221	361
17	Marine fisheries		115	323
18	Livestock farming and breeding (without grazing)	Stock feeding, poaching etc	13	288
19	Disease, pathogens and parasites		101	258
20	Insufficient pest control		21	228
21	Habitat fragmentation		-	190
22	Climate change impacts		-	80

Most prominent issues affecting N2K features in Wales
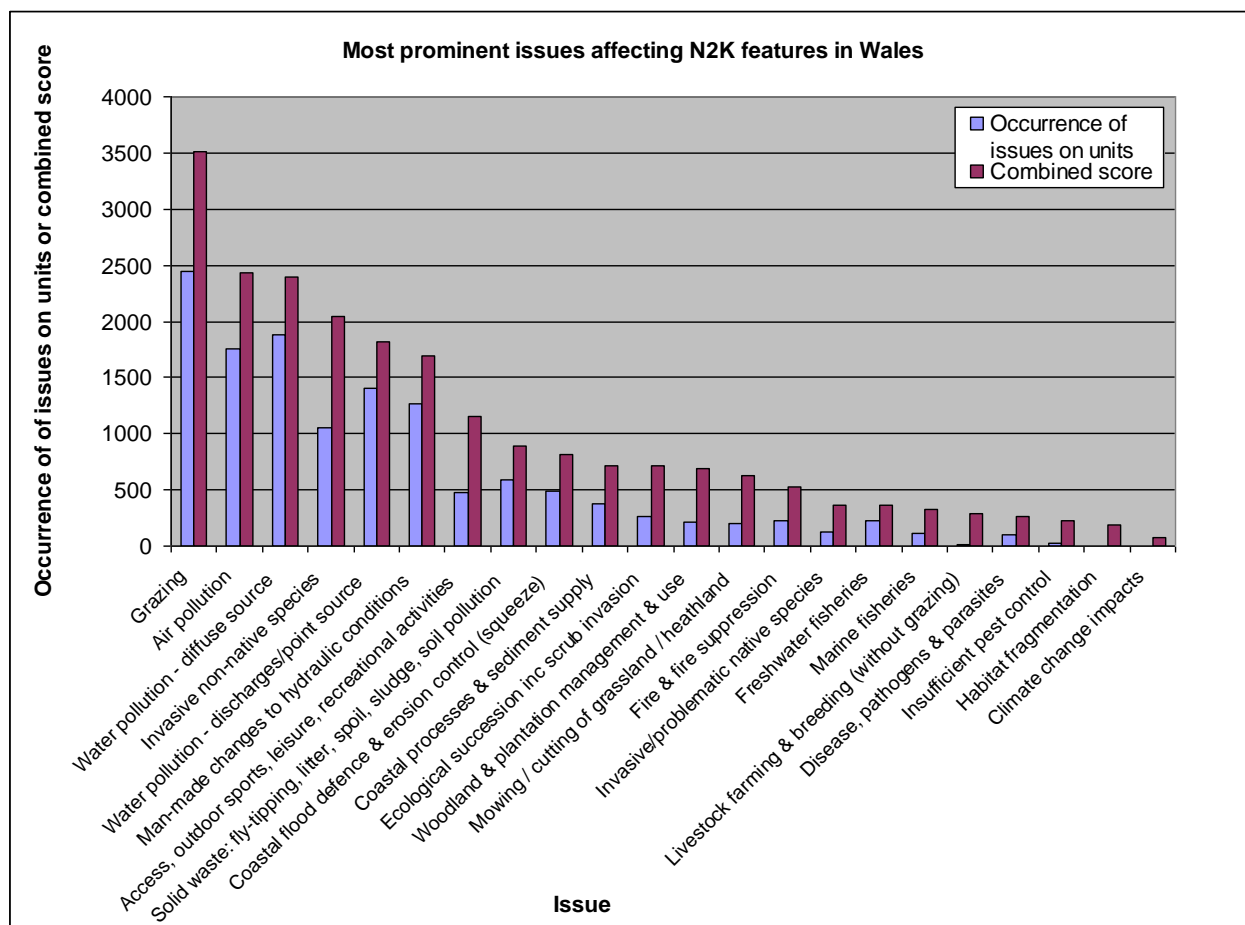
Virtually all Natura 2000 features face challenges. Of the 119 Natura 2000 features studied, only 11 were recorded as being unaffected by adverse impacts[4]. For all others (91%), at least one and frequently many, units where the feature was present were affected. In total 14,700 occurrences of issues were cited as affecting features on management units on Natura 2000 sites.[5]

While 44 different issues were identified, the six most common issues account for the majority of the pressures to Natura 2000 features. Inappropriate grazing, air and water pollution, invasive alien species and artificial changes to hydrology account for 63% of all issues cited (9330 out of 14,700). These issues tend to appear repeatedly across many different Natura 2000 sites and ecosystems, whether upland, coastal, freshwater or marine.

Stakeholders emphasised the importance of marine fisheries, habitat fragmentation and climate change. Figures on these issues were not available for analysis so their prominence is under-represented in the table and chart above.

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[4] In some cases, this may be due to lack of data rather than absence of all issues.
[5] Each issue was counted individually – if a unit contained 3 features and each as affected by 1 issue the issue affecting the features on the unit would be counted 3 times.

2.4   Broad Issue Categories

The chart below shows issues assigned to broad issue categories and ranked.

Issues by Broad Category
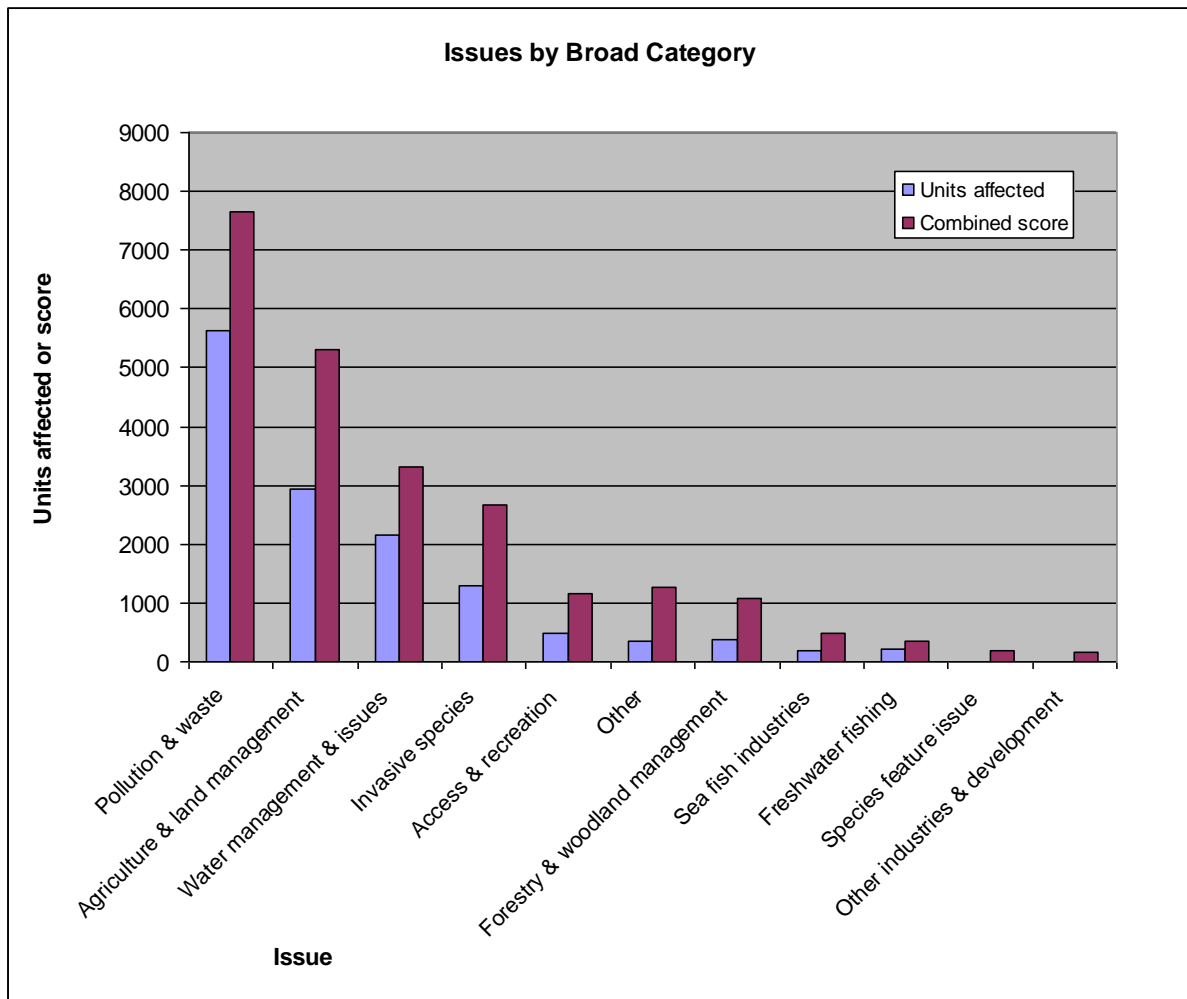
The main challenges to be addressed relate to pollution and waste, agriculture and land management, water management, and invasive species. These accounted for 88% of all issues affecting units across all Natura 2000 features. Again, issues relating to sea fisheries are probably under-represented.

2.5 Strategic Issues for Wales

Prominent issues within the same sector can be managed together. Therefore, it is possible to identify 15 major issue groups which may be addressed at a strategic level.

Strategic Issue	Prominent Issue as identified in study	Broad category
Grazing and mowing (inappropriate regimes) and related livestock farming practices and changes	Grazing	Agriculture & land management
	Mowing/cutting of grassland/ heathland	
	Ecological succession inc scrub invasion	
	Livestock farming and breeding (without grazing)	
Air pollution	Air pollution	Pollution & waste
Diffuse water pollution	Water pollution - diffuse source	
Point source water pollution	Water pollution - discharges/point source	
Solid waste and marine litter	Solid waste: fly-tipping, litter, dumping spoil, sludge etc and soil pollution	
Man-made changes to hydraulic conditions	Man-made changes to hydraulic conditions	Water management
Coastal flood and erosion defence, squeeze, processes and sediment supply	Coastal flood defence and erosion control (squeeze)	
	Coastal processes and sediment supply	
Invasive species (native and non-native) and pathogens	Invasive non-native species (terrestrial and marine)	Invasive species
	Invasive/problematic native species	
	Disease, pathogens and parasites	
	Insufficient pest control	
Access and recreational activities	Access, outdoor sports, leisure and recreational activities	Access and recreation
Woodland / plantation management (inappropriate)	Inappropriate woodland and plantation management and use	Forestry and woodland management
Freshwater fisheries	Freshwater fishing and harvesting aquatic resources	Freshwater fishing
Marine fisheries	Marine fisheries	Sea fish industries
Climate change impacts	Climate change	Other
Fire and fire suppression	Fire and fire suppression	
Habitat fragmentation	Habitat fragmentation	

2.6 Prominent Issues Affecting Each Feature Group

The ten most prominent issues for each group are shown below. The figures shown represent a combination of data derived from the data analysis (number of units affected) and a prominence ranking expressed by stakeholders. While some issues, such as grazing, invasive species and water pollution are cross-cutting and affect a number of themes, each theme has a distinctly different set of prominent issues.

2.6.1 Issues Affecting Terrestrial Features

Prominent Terrestrial Issues

Pie chart values: 1623, 1337, 565, 432, 377, 367, 251, 236, 208, 190, 1108

Legend:
- Air pollution
- Grazing
- Invasive non-native species (terrestrial and marine)
- Man-made changes to hydraulic conditions
- Outdoor sports, leisure and recreational activities
- Ecological succession inc scrub invasion
- Fire and fire suppression
- Inappropriate woodland and plantation management and use
- Livestock farming and breeding (without grazing)
- Habitat fragmentation
- Other

26 different issues were identified as adversely affecting the 31 terrestrial features. Issues for terrestrial features were cited 3754 times in the Actions Database – 26% of the total. The challenges on land are dominated by air pollution and issues associated with livestock farming. The latter include unsuitable grazing (undergrazing, overgrazing and inappropriate type and timing) and associated outcomes such as scrub invasion, as well as other factors such as poaching and supplementary feeding.

2.6.2 Issues Affecting Freshwater and Wetland Features

Prominent Freshwater and Wetland Issues

Legend
■ Water pollution - diffuse sources
□ Man-made changes to hydraulic conditions
■ Grazing
■ Water pollution - discharges/point source
□ Air pollution
■ Invasive non-native species (terrestrial and marine)
■ Freshwater fishing and harvesting aquatic resources
■ Inappropriate woodland and plantation management and use
■ Mowing / cutting of grassland
■ Solid waste: fly-tipping, litter, dumping spoil, sludge etc, soil pollution
□ Other

Pie chart values: 1132, 1111, 1103, 874, 746, 611, 361, 320, 279, 253, 890

30 different issues were identified as adversely affecting the 34 freshwater and wetland features. Issues were cited 5289 times in the Actions Database – the highest at 36% of the total – indicating the vulnerability of these ecosystems to external impacts. Unsurprisingly water-related issues (pollution, artificial modifications to water levels and flows) dominate. Insufficient grazing and mowing is also a key issue for wetlands.

2.6.3 Issues Affecting Marine Features

Prominent Marine Issues

Legend
■ Water pollution - diffuse sources
■ Water pollution - discharges/point source
■ Solid waste: fly-tipping, litter, dumping spoil, sludge etc, soil pollution
■ Coastal flood defence and erosion control (squeeze)
■ Invasive non-native species
■ Coastal processes and sediment supply
■ Access, outdoor sports, leisure and recreational activities
□ Gathering marine resources
■ Grazing
■ Marine fisheries
□ Other

Pie chart values: 1023, 797, 531, 457, 436, 359, 326, 171, 161, 150, 251

Cyfoeth Naturiol Cymru Natural Resources Wales
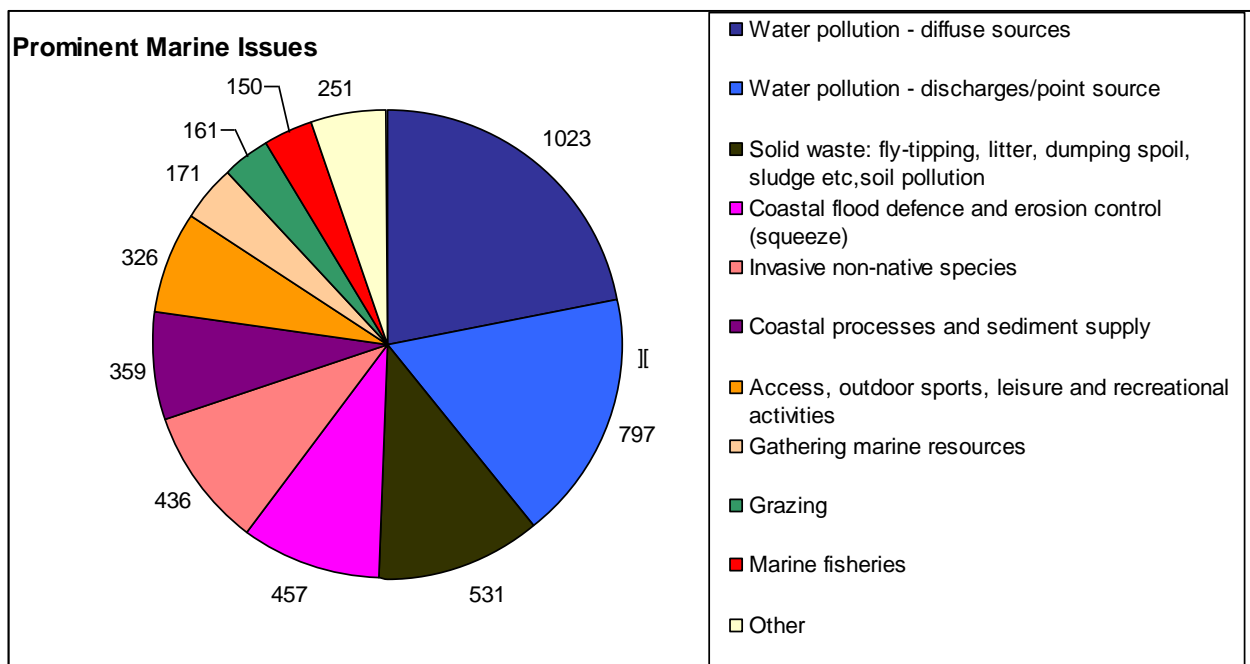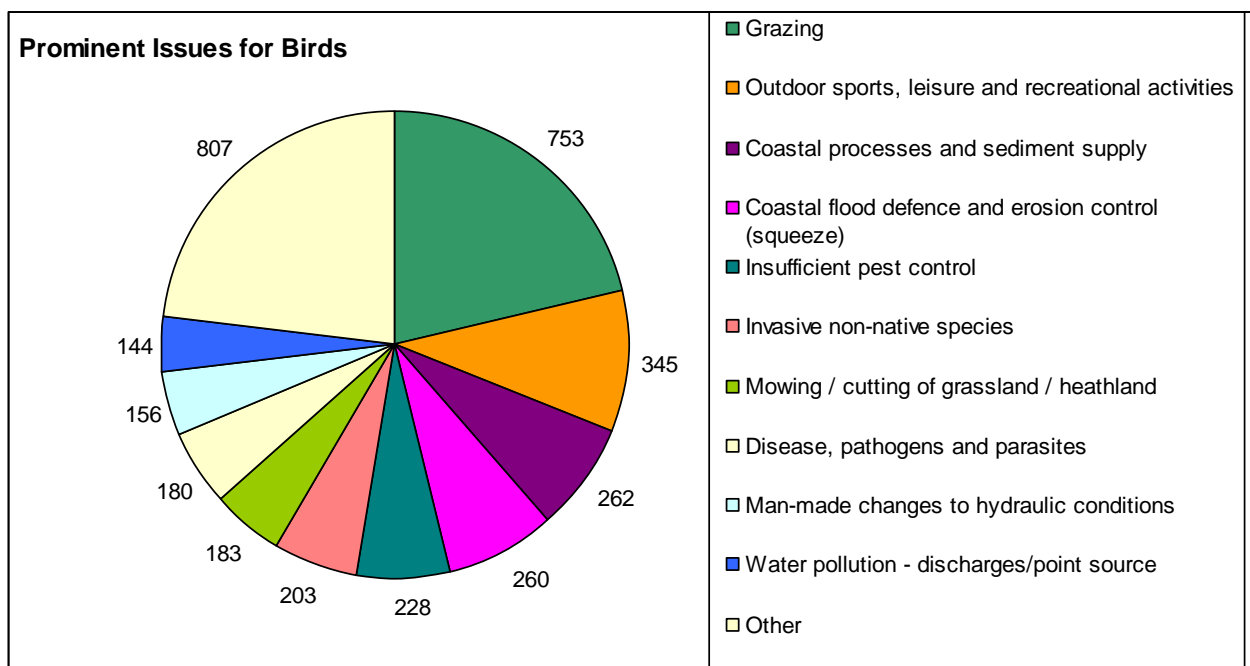
Llywodraeth Cymru Welsh Government

NATURA 2000

26 different issues were identified as adversely affecting the 19 marine features. Issues for marine features were cited 3649 times in the Actions Database – 25% of the total. The dominant challenges are water pollution and waste, including marine litter which is a particular problem for birds and marine mammals. Issues connected with management of the coastline and the interaction between artificial coastal defences and erosion, sediment supply and sea level rise are also very significant.

Marine fisheries data was not included in the data analysis; therefore this issue is under-represented in the chart. A lack of detailed information for example on the scale or intensity of issue was identified by stakeholders as a cross-cutting concern.
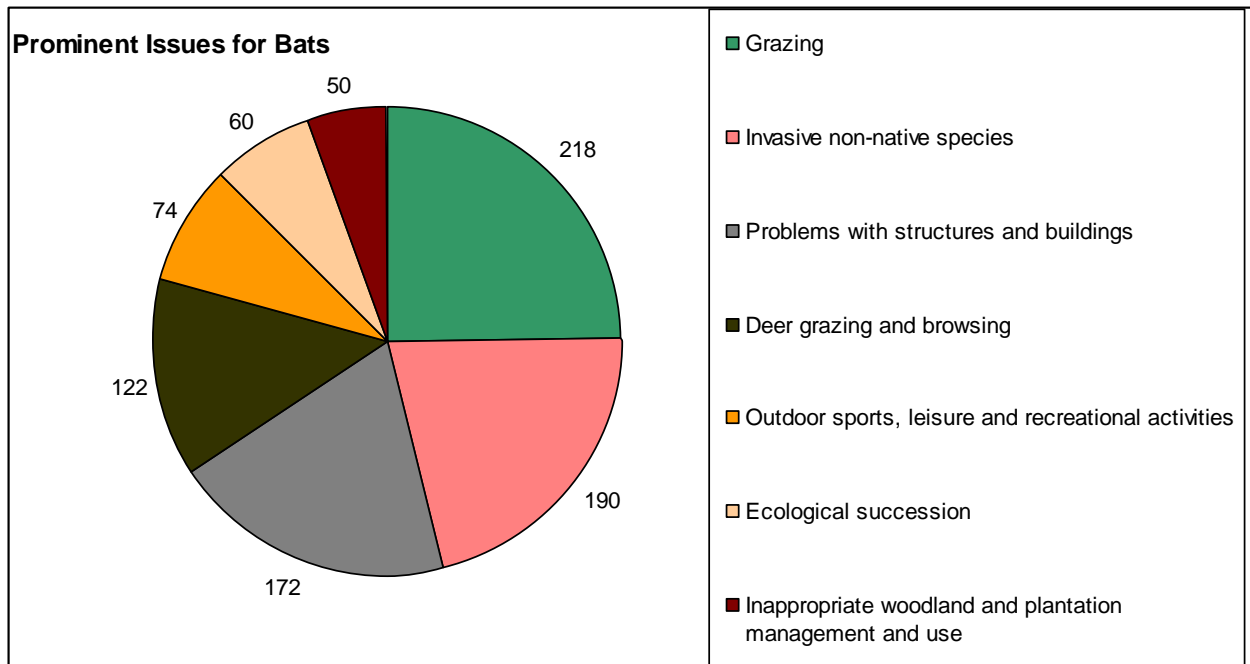
2.6.4 Issues Affecting Bird Features

Prominent Issues for Birds

Legend:
- Grazing
- Outdoor sports, leisure and recreational activities
- Coastal processes and sediment supply
- Coastal flood defence and erosion control (squeeze)
- Insufficient pest control
- Invasive non-native species
- Mowing / cutting of grassland / heathland
- Disease, pathogens and parasites
- Man-made changes to hydraulic conditions
- Water pollution - discharges/point source
- Other

Values shown: 753, 345, 262, 260, 228, 203, 183, 180, 156, 144, 807

In total, 24 different issues were identified as adversely affecting 32 bird features. Issues were cited 1612 times in the Actions Database – 11% of the total. There were fewer recorded issues for birds than may be expected, possibly due to a paucity of data but also because many of the marine species are believed to be in favourable condition. Seven bird species (mostly marine) had no issues recorded against them. However, estuarine species suffered from the largest combined range of issues (e.g. outdoor sports, recreation, water pollution, coastal processes and flood defence) which are associated with such complex habitats.

Appropriate conservation management of upland heathland is a key issue for birds of prey, as are grazing regimes, on coastal heath and grassland to provide suitable habitat for foraging chough. Disturbance caused by human access and recreation is a significant factor, particularly for estuarine species.

2.6.5 Issues Affecting Bat Features

Prominent Issues for Bats

Legend:
- Grazing
- Invasive non-native species
- Problems with structures and buildings
- Deer grazing and browsing
- Outdoor sports, leisure and recreational activities
- Ecological succession
- Inappropriate woodland and plantation management and use

Pie chart values: 218, 190, 172, 122, 74, 60, 50

Seven different issues were identified as adversely affecting two bat features (lesser horseshoe bat and greater horseshoe bat). There were no issues recorded for barbastelle bat[6]. Issues were cited for bats 396 times in the Actions Database – 3% of the total. For both species, the issues can be divided into those that affect roosting and those that affect commuting and foraging (including prey availability).

'Problems with structures and buildings' is a major issue for roosting and relates largely to changes in building practice and developments. For commuting and foraging these bats rely on linear features, grazed wet grassland and woodland, therefore achieving appropriate management practices in these areas are key. Invasive non-native species, deer grazing and browsing and ecological succession are issues which affect the woodland habitats used by the bat species, rather than issues directly affecting the bats themselves.

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[6] Although this may reflect the small extent of the designated area, and insufficient recording rather than a complete absence of issues.

3. Prominent Risks to Natura 2000 in Wales

3.1 Limitations of Data and Use

Except for marine features, data on risks is not held in the Actions Database, therefore, data for this analysis was derived principally from the Habitats Directive Article 17 reports and scientific literature (bird features). This information often focuses on individual features and was created by specialists, but, is generally less detailed and site-specific than that available in the Actions Database.

Data for marine features was derived from the Actions Database, but it was less comprehensive than that available for issues.

Other limitations expressed in 1.5 and 1.6 also apply. Further information on limitations is shown in Appendix A.

3.2 Prominent Risks Across Wales

The dominant risks identified as being likely to adversely affect Natura 2000 features in the near future[7] are shown below.

The 'No of features affected' column shows the results of the initial data analysis and indicates the number of different Natura 2000 features cited as potentially being at risk (threat). The 'Combined score' takes account of the views of stakeholders, being the sum of the 'No of features affected' and the stakeholder ranking of risks.

	Risk	No of features affected	Combined score
1	Grazing	36	82
2	Air pollution, air-borne pollutants	35	81
3	Invasive non-native species	38	63
4	Climate change	0	57
5	Renewable abiotic energy use	10	54
6	Human induced change to hydraulic conditions	30	50
7	Pollution to surface waters	22	44
8	Fertiliser use	17	40
9	Outdoor sports, leisure and recreational activities	17	40
10	Mowing / cutting of grassland / heathland	5	39
11	Biocentric evolution, succession	23	33
12	Disease and pathogens	0	32
13	Modification of cultivation practice	9	31
14	Use of biocides, hormones and chemicals	7	29
15	Major oil spill or pollution incident	0	27
16	Coastal flood defence and erosion control (including squeeze)	6	24
17	Fire and fire suppression	10	23
18	Waste impacts -fly-tipping, litter etc	7	21

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[7] Generally considered to be by 2020.

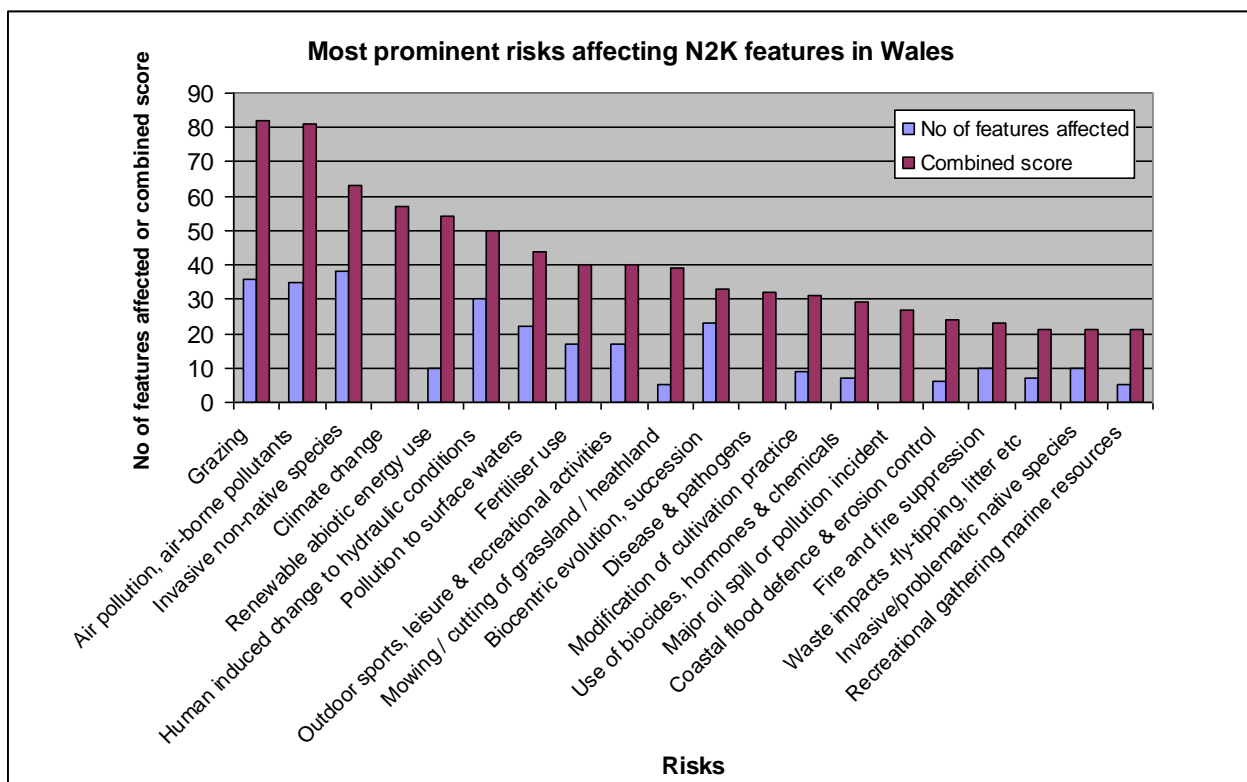| 19 | Invasive/problematic native species | 10 | 21 |
| 20 | Recreational gathering marine resources e.g. seaweed, bait | 5 | 21 |

The results show that Natura 2000 features could be adversely affected by quite a broad range of risks in the future (as shown by the more even distribution of frequency of risks in the chart below as compared with the quite narrow distribution of issue occurrences shown in Section 2.)

In part this is due to fact that both existing and new risks have been taken into account. Many of the prominent issues have also been identified as major risks. This indicates that the issue in question cannot be resolved or may increase in intensity or extent in the near future, for example, inappropriate grazing, air pollution, invasive non-natives, outdoor recreation.

The study also highlights a number of threats which have become of greater concern in recent years. For example, impacts of climate change, disease and pathogens, biocides, hormones and other chemicals and renewable energy developments. However, currently there is insufficient knowledge about the nature and extent of such threats on Natura 2000 features.
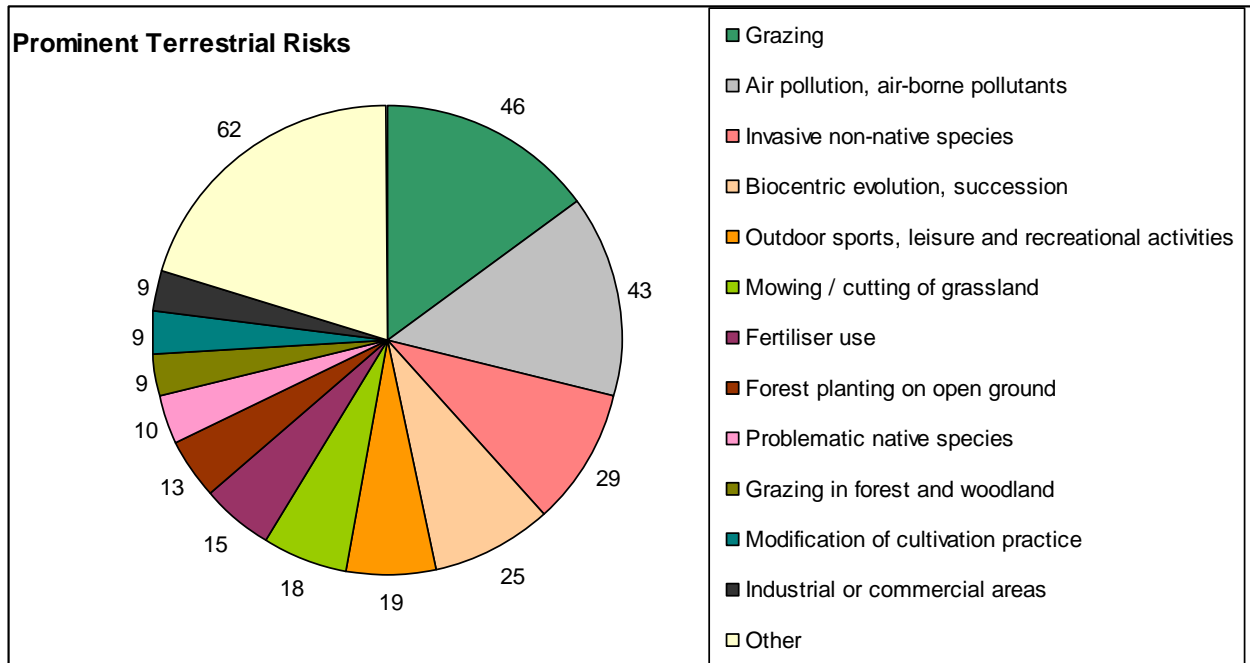
Impacts of the potential future modification of farming practice and systems were also flagged up by workshop participants.

Most of the identified major risks are ongoing factors, however, a single incidence of an event such as a major oil spill could have significant impact on Natura 2000 habitats and species in Wales.


Most prominent risks affecting N2K features in Wales

3.3 Prominent Risks Affecting Each Feature Group

3.3.1 Risks Affecting Terrestrial Features

Prominent Terrestrial Risks

Legend:
- Grazing
- Air pollution, air-borne pollutants
- Invasive non-native species
- Biocentric evolution, succession
- Outdoor sports, leisure and recreational activities
- Mowing / cutting of grassland
- Fertiliser use
- Forest planting on open ground
- Problematic native species
- Grazing in forest and woodland
- Modification of cultivation practice
- Industrial or commercial areas
- Other

Values shown: 46, 43, 29, 25, 19, 18, 15, 13, 10, 9, 9, 9, 62

A total of 25 different risks were identified for the terrestrial features. The dominant risks largely reflect the main issues shown in Section 2, indicating that many of the factors are considered to be difficult to resolve across the full extent of any site, and/or are likely to intensify with time. For example, inappropriate grazing levels are already an issue for many features but as the farming population ages and farms change hands there is a risk that traditional farming practice and therefore, grazing may cease or change in some areas.
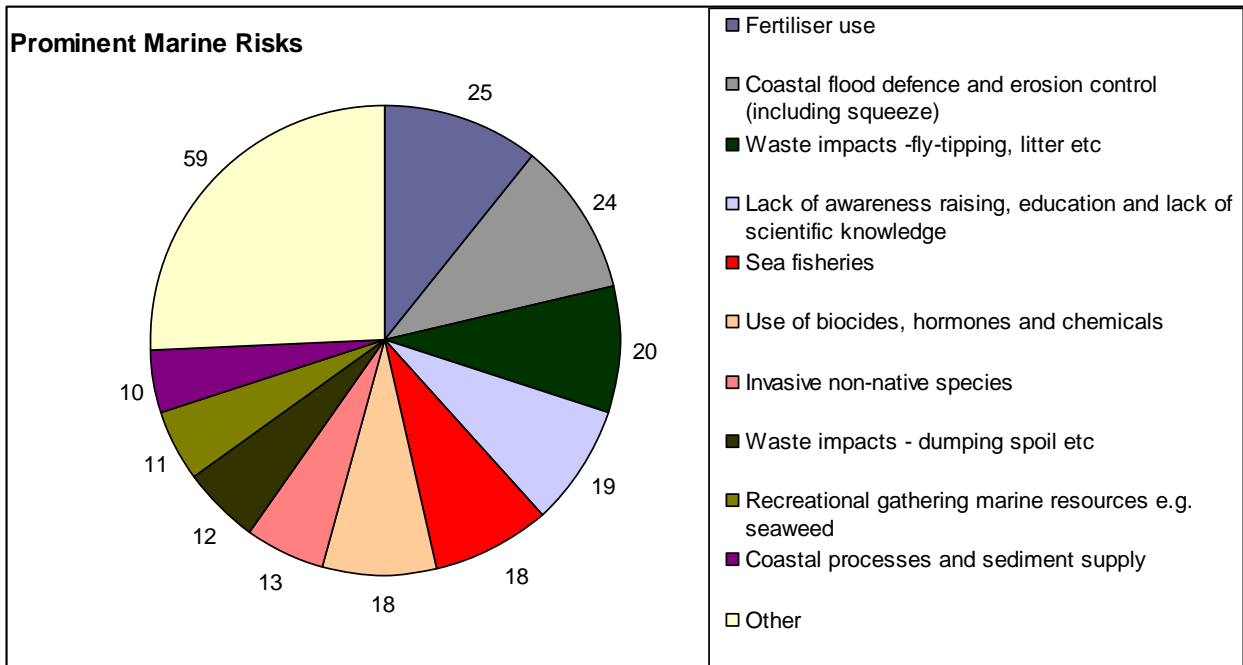
3.3.2 Risks Affecting Freshwater and Wetland Features
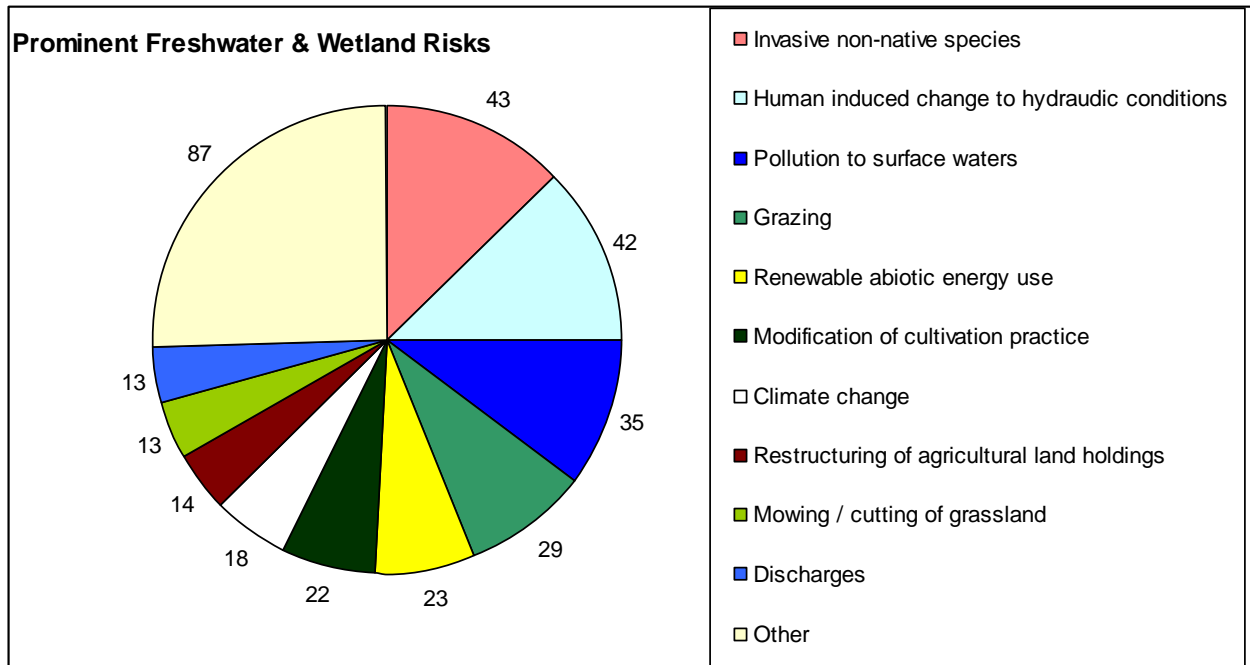
A total of 23 different risks were identified for the freshwater and wetland features. As with terrestrial features some issues are re-stated as risks, for example invasive alien species, such as the case of Himalayan balsam, which is likely to spread further without additional control measures.

However, workshop participants noted other factors in particular the modification of waterways for renewable energy such as hydroelectric schemes and the risk of climate change influencing water levels (due to floods or droughts). Risks connected to potential changes to farming practice such as intensification, conversion of pasture to arable were also noted.

3.3.3 Risks Affecting Marine Features

Prominent Marine Risks

Pie chart values: 25, 24, 20, 19, 18, 18, 13, 12, 11, 10, 59

Legend:
- Fertiliser use
- Coastal flood defence and erosion control (including squeeze)
- Waste impacts -fly-tipping, litter etc
- Lack of awareness raising, education and lack of scientific knowledge
- Sea fisheries
- Use of biocides, hormones and chemicals
- Invasive non-native species
- Waste impacts - dumping spoil etc
- Recreational gathering marine resources e.g. seaweed
- Coastal processes and sediment supply
- Other

A total of 17 different risks were identified for the marine features. As sea levels are predicted to rise, risks connected with the factors causing coastal squeeze appear as a dominant threat. While marine waste and nutrient pollution are again noted, other pollutants such as hormones and biocides are highlighted. Impact of the sea fisheries industries is also a major risk, as is the general lack of information available about the marine environment.

3.3.4 Risks Affecting Bird Features
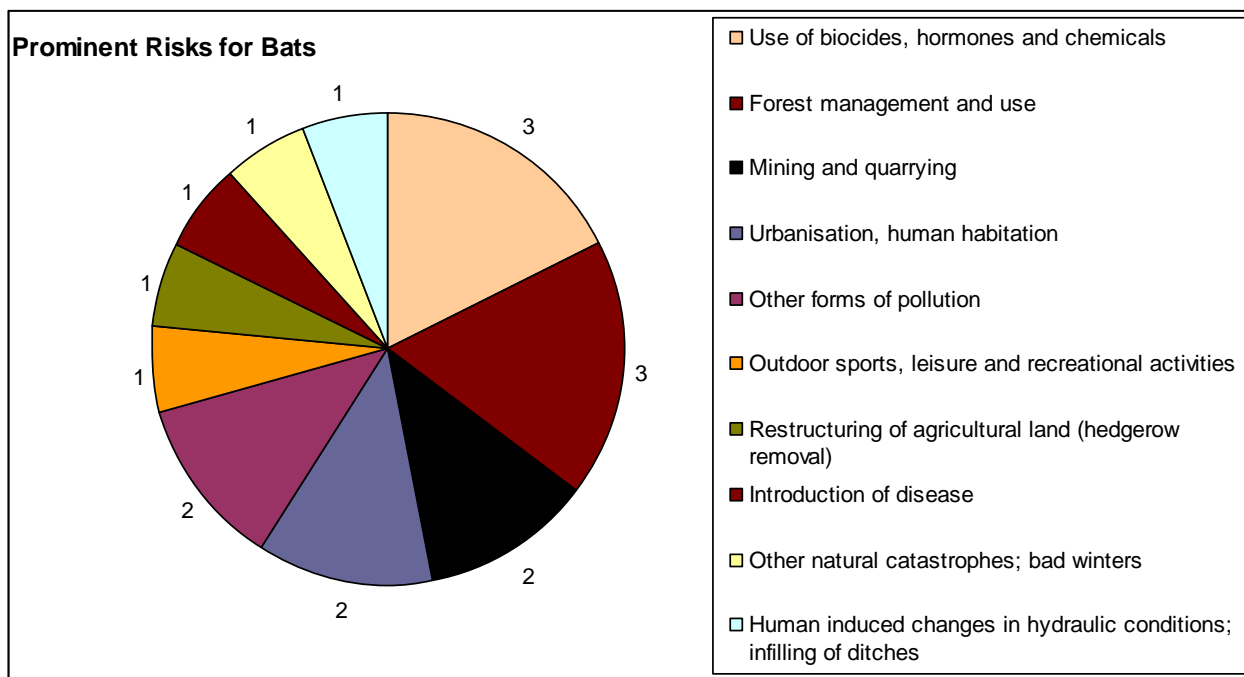
Prominent Risks for Birds
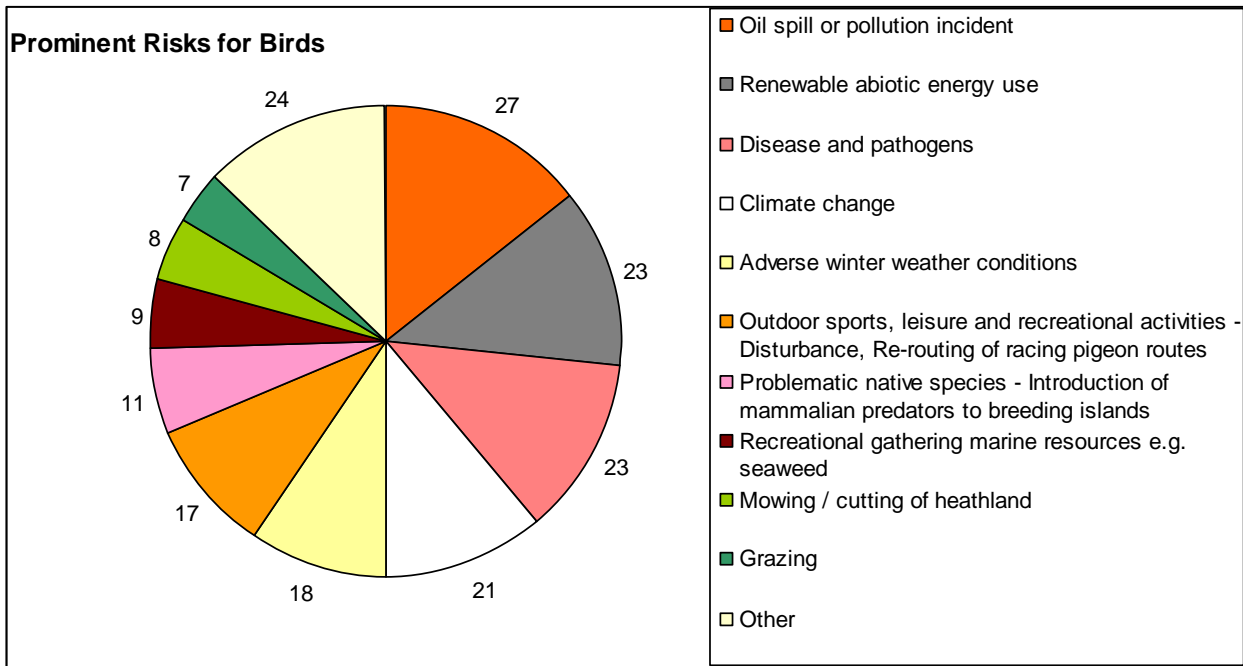
A total of 18 different risks were identified for bird features. The possibility of a major pollution incident remains one of the most significant threats for marine and estuarine birds. Impacts of inappropriate renewable energy developments may also be significant. Climate change was flagged as a major factor, particularly the possible increase in spring/summer rainfall, loss of food supplies due to sea warming, changes to migration patterns (short stopping) and harsh winters.

Avian diseases (including *Puffinosis* and avian flu) were also recorded as significant – there is probably a low likelihood of occurrence but the potential impact could be high. It was recognised that species such as Red-throated diver and Common Scoter are very susceptible to human disturbance in winter foraging and roost areas. The introduction of mammalian predators to island sites such as Skokholm and Skomer would have serious implications to the viability of seabird populations such as Manx shearwater.

The risk of changes in agriculture, such as abandonment of grazing in the uplands was not identified in the results but could have an impact in the future.

3.3.5 Risks Affecting Bats

Prominent Risks for Bats

□	Use of biocides, hormones and chemicals
■	Forest management and use
■	Mining and quarrying
■	Urbanisation, human habitation
■	Other forms of pollution
□	Outdoor sports, leisure and recreational activities
■	Restructuring of agricultural land (hedgerow removal)
■	Introduction of disease
□	Other natural catastrophes; bad winters
□	Human induced changes in hydraulic conditions; infilling of ditches

A total of 10 different risks were identified for bat features. Simplification of landscapes (e.g. loss of hedgerows) due to changes in farming practice and urbanisation and industrial land uses are major risks as they would result in the reduction of prey and the loss of roosting sites and foraging and commuting habitat.

Appendix A: Methods Used in Study

1. Data Analysis

1.1 Data Sources for Issues and Risks

No one data source held full, high quality data for all the feature groups, therefore, in addition to the primary data source, it was necessary to use a variety of additional information to validate and support the data. The data sources are shown below; the primary data sources are marked in bold.

Feature group	Issues	Risks
Terrestrial	**NRW Actions Database** NRW Natura 2000 Core Management Plans NRW Special Area of Conservation monitoring reports UK Air Pollution Information System (APIS)	**Habitats Directive UK Article 17 Report threat data**
Freshwater and Wetland	**NRW Actions Database** NRW Core Management Plans NRW SAC monitoring reports APIS	**Habitats Directive UK Article 17 Report threat data**
Marine	**NRW Actions Database**	**NRW Actions Database**
Birds	**NRW Actions Database**	Draft Birds Directive Article 12 threats Professional judgement **Scientific peer-reviewed literature** Published report/data Unpublished data
Bats	**NRW Actions Database**	**Habitats Directive UK Article 17 Report threat data**

1.2 Quality of Data Sources

1.2.1 Natural Resources Wales Actions Database Data

The NRW Actions Database is a communication tool that holds actions associated with all designated sites in Wales. Each action includes an issue, mechanism and is assigned to an organisation and is subject to annual review and update. It is populated by the Natural Resources Wales conservation officer responsible for a given site

However, it does have a number of limitations, specifically:

- At the time of the analysis the Actions Database did not have the capacity to identify which issues relate to which features. Therefore, this link had to be established as part of the study.

- There are variations in terms of professional opinion, level of detail, quality and frequency of updating.

- Issue data for the bird and marine features was generally more sparsely populated compared to, for example, terrestrial features. A strategic review of marine actions is underway but only partially complete, and changes identified by the review were not included in the Database at the time of the analysis.

- The Actions Database currently only holds data on 'Risks' for marine sites.

1.2.2 Habitat Directive Article 17 Report Data

- Data derived from the UK Habitats Directive UK Article 17 Report applies to the feature over the whole of its range in Wales, both inside and outside Natura 2000 sites, while this study is concerned only with risks affecting features on sites. This may bias the data somewhat, particularly for widely distributed features where much of the Welsh resource is found outside Natura 2000 boundaries.

- Article 17 data is collated by Natural Resources Wales habitat and species specialists at an all-Wales scale, relying on a range of survey and research material and a degree of professional judgement.

1.3 Method of Data Processing and Analysis

1.3.1 Issues

The analysis was carried out for each feature individually. The frequency of occurrence of an issue on units on all Natura 2000 sites across Wales was calculated (i.e. number of units affected by the issue), and the issues ranked. The frequency of occurrence was therefore used as a proxy for the importance/dominance/impact of a given issue.

The Actions Database was queried in February 2013 to produce spreadsheets of issues and related actions. A link to the feature was established manually. The data and link was validated and processed (e.g. to remove duplicates), before calculating number of units affected

Totals for individual features were amalgamated to create lists of prominent issues for feature types, and in turn these were amalgamated to create lists of dominant issues for broader feature groups.

1.3.2 Risks

Marine features: Risks were analysed in the same way as issues (see section 1.3.1 above).

Terrestrial, freshwater and wetland and bat features: Article 17 threat data was used. The number of different features ranked as having high or medium impact were counted.

Bird features: Risks were identified from scientific papers, expert opinion within Natural Resources Wales, unpublished papers etc. The professional judgement of workshop delegates was used to establish the level of impact using a matrix supplied

which quantified timing, scope and severity of the risk. The number of different features ranked with high or medium risks were counted.

1.4   Limitations of Issue and Risk Methods

- One issue may impact upon a number of features, and will be counted separately for each feature.

- Frequency of occurrence is not necessarily an accurate proxy for severity of impact or importance of the issue in relation to a feature. It also does not reflect the fact that units vary in size.

- Natural Resources Wales are currently undertaking a review of actions relating to the sea fish industry. For the marine theme all issues and risks relating to the 'Sea Fish Industries' was screened out of the data. The LIFE Natura 2000 Programme will work collaboratively to address the issues and actions connected to marine fisheries once the review is complete

- Since data sources and methods varied between themes, the final analysis involved amalgamating different types of data, meaning that it was not always possible to compare like-with-like.

2. Stakeholder Consultation

2.1   Purpose and Format of Workshops

In June 2013, the LIFE Natura 2000 Programme hosted a series of consultation events across Wales. The aims of the workshops were to:

- Present and share the method and findings of the analysis on issues and risks; and give stakeholders the chance to express an opinion on its validity and relevance;

- Allow delegates to contribute information, expertise and opinion on issues and risks;

- Identify those issues and risks which are considered of primary importance in Wales by stakeholders;

- Provide an opportunity to discuss the findings with others and reach a consensus;

- Involve stakeholders in the process of developing the LIFE Natura 2000 Programme and engender a sense of ownership and willingness to undertake actions.

Workshops were held as shown below:

Date	Location	Themes covered	No of delegates
6 June 13	Cardigan Guildhall	Terrestrial Freshwater & Wetlands Marine	18
7 June 13	Cardiff City Hall	Terrestrial Freshwater & Wetlands Marine	24
10 June	Shrewsbury Gateway Centre	Birds	15
12 June	Llandudno Junction, Conwy Business Centre	Terrestrial Freshwater & Wetlands Marine	20
		TOTAL	**77**

By running the three identical events in different parts of Wales it was possible to gain good attendance from the widest possible range of stakeholders, pick up on regional issues and differences and avoid dominance by one set of stakeholders.

The workshops were well attended with delegates providing a cross-section of expertise from the public, private, voluntary and business environmental sectors. A total of 154 organisations were invited. One or more representatives from the following organisations attended.

Type	Organisation
Utilities	Dwr Cymru
Local authorities	Flintshire County Council
	Welsh Local Government Association
Agriculture and fishing sector	Farmers Union Wales
	National Farmers Union
Recreation sector	Welsh Yachting Association
Marine Relevant Authority Groups and Special Areas of Conservation Officers	Carmarthen Bay and Estuaries
	Pen Llyn a'r Sarnau
	Severn Estuary Partnership
	Pembrokeshire Marine
Conservation non-governmental organisations	National Trust
	RSPB
	Sea Watch Foundation
	WWF Wales
	Wildlife Trust of South & West Wales
	Wales Environmental Link
	Marine Conservation Society
	Welsh Ornithological Society
	British Trust for Ornithology Wales
	Wye and Usk Foundation
Publically funded bodies	Natural Resources Wales
	Natural England (IPENS project)
Welsh Government	Department of Marine Biodiversity & Conservation
	Marine Branch, Department of Environment and Sustainable Development
Other	Crown Estate
	UK Cetacean Strandings Investigation Programme
	Wales Biodiversity Partnership Ecosystem Group chairpersons

2.2 Workshop Tasks

At each event, the delegates were divided into separate groups of around 5 to 10 individuals and a facilitator. Each group covered one or two feature types (e.g. woodland, marine species, upland birds) selected on the basis of the expertise of the group members.

Delegates were asked to undertake the following tasks:-

- Identify any additional prominent issues/risks not identified by data analysis.

- Identify the 10 most prominent/important issues/risks and then refine to produce a list of the 5 most prominent issues.

- For risks that may affect SPA bird features, workshop groups were in addition asked to assign an impact score for each risk.

Sea fisheries was not excluded as an issue/risk from the workshops.

Following the workshops an analysis was also carried out to determine the following:

- The degree of correlation or difference between the results of the data analysis and the views of the stakeholder; and identification of any major disagreement about particular issues.

2.2.1 Assessment of Quality of Information Derived from the Workshops

- In general there was a high level of expertise and breadth of experience and professional opinion available within the workshops and delegates could readily pinpoint key issues and risks in the wider context. They could also readily identify omissions and shortcomings in the data. However, some delegates were unfamiliar with the concept and terminology used in the data analysis and the Actions Database.

- Some delegates were not comfortable with the process of identifying major issues and risks on a national scale.

- Whilst there was a good range of representation from stakeholder organisations, there was a bias towards the traditional conservation sector, with fewer representatives from industry, fishing sector, Welsh government departments, and other sectors such as transport, energy, health etc.

- Different groups categorised issues and risks at different scales and in different ways, which could potentially skew the final analysis.

- Not all groups rigorously ranked their key issues and risks numerically.

2.3   Quality of Data Analysis and Level of Consensus

The five most prominent issues identified for each feature type from the data analysis was compared with the most prominent issues identified by the delegates. The results are shown below.
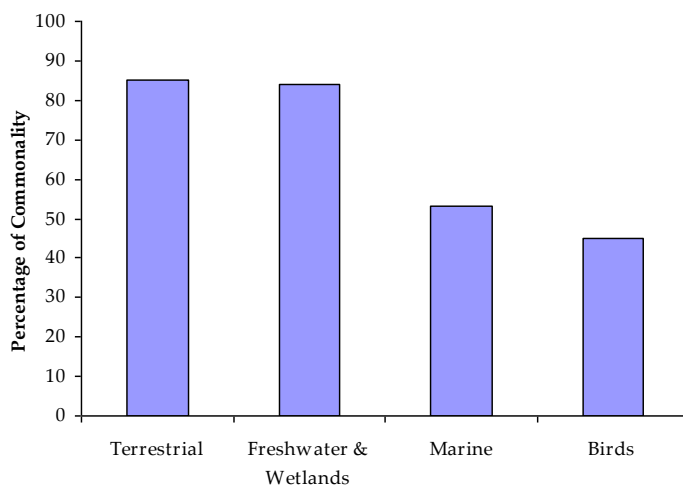
Within the **terrestrial and freshwater and wetland feature** group there was a good correlation between the data analysis and stakeholder opinion (85% and 84% respectively, of the issues identified by the data analysis were also selected as being of primary importance by the stakeholder groups). There was general support for the approach to data analysis and the results.

For **marine features** there was only a 53% commonality between the primary issues identified by the data analysis and those selected by the stakeholder groups.

For **bird features** there was only a moderate consensus of the prominent issues affecting all bird features between the data analysis and the workshop groups. However, there was a stronger agreement for the upland, coastal and estuarine feature types as they were able to agree on 9 out of the 15 prominent issues identified by the data analysis. In contrast, the marine birds group, showed the least level of consensus between the analysis findings and the views of the workshop group. Again this highlights deficiencies in Actions Database data in this area.

There was a lower level of consensus between stakeholders and the review findings for risks which indicated poor commonality for all feature groups (notably marine).

2.4   Additional Issues and Risks Identified by Stakeholders

The following issues and risks were not identified as prominent in the initial data analysis but were subsequently highlighted by as key issues or risks by stakeholders :

- Climate change impacts
- Habitat fragmentation
- Disease and pathogens
- Sea fisheries
- Changes to land use & agricultural restructuring e.g. removing hedgerows
- Renewable energy developments
- General development, urbanisation, etc

2.5   Method for Combining Results of Data Analysis and Stakeholder Opinion

Broad and sub-categories of issues used in different theme data were amalgamated into one standard category so figures could be cross-compared. Rankings for the most prominent issues and risks established in the workshops was used and converted to 'points' (i.e. most prominent issue was given 10 points). If there was more than one workshop then an average was taken.

If unit figure was over 100, the stakeholder score was weighted to give it fair prominence. Finally the unit figure and the stakeholder score were summed to give the overall combined score.

3.   Conclusion on Methods

The objective of this study was to use an evidence-driven approach to assessing the barriers to achieving successful conservation outcomes on Natura 2000. Considerable effort was taken to identify and source and analyse a range of information sources to derive a quantitative assessment of issues and risks.

The expert workshops were valuable to consolidate, review, interpret and validate the data. It also helped to engender stakeholder engagement, consensus-building and buy-in.

Appendix B: Classification of Natura 2000 features

Feature Group	Feature (Species & Habitat) Type	Feature name (informal)	Feature name (formal)
SAC terrestrial features	Woodland	Beech forests on acid soils	H 9120 Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*)
		Beech forests on neutral to rich soils	H9130 Asperulo-Fagetum beech forests
		Alder woodland on floodplains	H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)
		Yew-dominated woodland	H91J0 *Taxus baccata* woods of the British Isles
		Mixed woodland on base-rich soils associated with rocky slopes	H9180 Tilio-Acerion forests of slopes, screes and ravines
		Western acidic oak woodland	H91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles
	Temperate heath and scrub	Wet heathland with cross-leaved heath	H4010 Northern Atlantic wet heaths with *Erica tetralix*
		Dry heaths	H4030 European Dry Heaths
		Alpine and subalpine heaths	H4060 Alpine and Boreal Heaths
	Natural and semi-natural grassland	Tall herb communities	H6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
		Early gentian	S1654 *Gentianella anglica*
		Purple moor-grass meadows	H6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)
		Species-rich grassland with mat-grass in upland areas	H6230 Species-rich Nardus grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe)
		Dry grasslands and scrublands on chalk or limestone.	H6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*)
		Alpine and subalpine calcareous grasslands	H6170 Alpine and Subalpine calcareous grassland
		Montane acid grasslands	H6150 Siliceous Alpine and boreal grassland
		Grasslands on soils rich in heavy metals	H6130 Calaminarian grassland of the *Violetalia calaminariae*
	Coastal sand dunes	Shore dock	H1441 *Rumex rupestris*
		Narrow-mouthed whorl snail	S1014 *Vertigo angustior*
		Fen orchid	S1903 *Liparis loeselii*
		Petalwort	S1395 *Petalophyllum ralfsii*
		Humid dune slacks	H2190 Humid dune slacks
		Dunes with creeping willow	H2170 Dunes with Salix repens ssp. Argentea (*Salicion arenariae*)
		Dune grassland	H2130 Fixed dunes with herbaceous

Feature Group	Feature (Species & Habitat) Type	Feature name (informal)	Feature name (formal)
			vegetation (grey dunes)
		Shifting dunes with marram	H2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)
		Shifting dunes	H2110 Embryonic Shifting Dunes
	Rocky habitats and caves	Acidic scree	H8110 Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)
		Plants in crevices in base-rich rocks	H8210 Calcareous rocky slopes with chasmophytic vegetation
		Base-rich scree	H8120 Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)
		Plants in crevices on acid rocks	H8220 Siliceous rocky slopes with chasmophytic vegetation
		Caves not open to the public	H8310 Caves not open to the public
SAC freshwater and wetland features	Riverine	Rivers with floating vegetation often dominated by water-crowfoot	H3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation
		Allis shad	S1102 *Alosa alosa*
		Twaite shad	S1103 *Alosa fallax*
		White-clawed (or Atlantic stream) crayfish	S1092 *Austropotamobius pallipes*
		Bullhead	S1163 *Cottus gobio*
		River lamprey	S1099 *Lampetra fluviatilis*
		Brook lamprey	S1096 *Lampetra planeri*
		Otter	S1355 *Lutra lutra*
		Freshwater pearl mussel	S1029 *Margaritifera margaritifera*
		Sea lamprey	S1095 *Petromyzon marinus*
		Atlantic salmon	S1106 *Salmo salar*
		Killarney fern	S1421 *Trichomanes speciosum*
	Wetland	Active raised bogs	H7110 Active raised bogs
		Calcium-rich springwater-fed fens	H7110 Alkaline fens
		Blanket bog	H7130 Blanket bogs
		Bog woodland	H91D0 Bog woodland
		Calcium-rich fen dominated by great fen sedge (saw sedge)	H7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*
		Degraded raised bog	H7210 Degraded raised bogs still capable of natural regeneration
		Depressions on peat substrates	H7150 Depressions on peat substrates of the Rhynchosporion
		Hard-water springs depositing lime	H7220 Petrifying springs with tufa formation (Cratoneurion)
		Very wet mires often identified by an unstable `quaking` surface	H7140 Transition mires and quaking bogs
		Southern damselfly	S1044 *Coenagrion mercuriale*
		Slender green feather-moss	S1393 *Drepanocladus (Hamatocaulis) vernicosus*
		Marsh fritillary butterfly	S1065 *Euphydryas (Eurodryas, Hypodryas) aurinia*

Feature Group	Feature (Species & Habitat) Type	Feature name (informal)	Feature name (formal)
		Geyer`s whorl snail	S1013 *Vertigo geyeri*
		Desmoulin`s whorl snail	S1016 *Vertigo moulinsiana*
		High-altitude plant communities associated with areas of water seepage	H7240 Alpine pioneer formations of the *Caricion bicoloris-atrofuscae*
	Standing water/terrestrial	Great crested newt	S1166 *Triturus cristatus*
	Standing water	Calcium-rich nutrient-poor lakes, lochs and pools	H3140 Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.
		Acid peat-stained lakes and ponds	H3160 Natural dystrophic lakes and ponds
		Naturally nutrient-rich lakes or lochs which are often dominated by pondweed	H3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation
		Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels	H3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the Isoëto-Nanojuncetea
		Turloughs	H3180 Turloughs
		Floating water-plantain	S1831 *Luronium natans*
SAC marine features	Habitats	Lagoons	H1150 Coastal Lagoons
		Sea caves	H8330 Submerged or partially submerged sea caves
		Subtidal sandbanks	H1110 Sandbanks that are covered by sea water all the time
		Reefs	H1170 Reefs
		Intertidal mudflats and sandflats	H1140 Mudflats and sandflats not covered by sea water at low tide
		Shallow inlets and bays	H1160 Large shallow inlets and bays
		Estuaries	H1130 Estuaries
		Annual vegetation of drift lines	H1210 Annual vegetation of drift lines
		Glasswort and other annuals colonising mud and sand	H1310 Salicornia and other annuals colonising mud and sand
		Atlantic salt meadows	H1330 Atlantic salt meadows (Glauco-Puccinelietalia maritimae)
	Species	Grey seal	S1364 *Halichoerus grypus*
		Bottlenose dolphin	S1349 *Tursiops truncates*
		River lamprey**	*S1095 Petromyzon marinus***
		Sea lamprey**	*S1099 Lampetra fluvitalis***
		Allis shad**	*S1102 Alosa alosa***
		Twaite shad**	*S1103 Alosa fallax***
		Otter**	*S1355 Lutra lutra***
SPA bird features	Upland	Merlin	*Falco columbarius*
		Peregrine	*Falco peregrinus*
		Hen Harrier	*Circus cyaneus*
		Red kite	*Milvus milvus*
		Short-eared owl	*Asio flammeus*
	Marine	Arctic Tern	*Sterna paradisaea*
		Roseate Tern	*Sterna dougallii*
		Little Tern	*Sterna albifrons*
		Common Tern	*Sterna hirundo*
		Sandwich Tern	*Sterna sandvicensis*

Feature Group	Feature (Species & Habitat) Type	Feature name (informal)	Feature name (formal)
		Red-throated Diver	*Gavia stellata*
		Common Scoter	*Melanitta nigra*
		Gannet	*Morus bassanus*
		Lesser Black-backed Gull	*Larus fuscus*
		Manx Shearwater	*Puffinus puffinus*
		Storm Petrel	*Hydrobates pelagicus*
		Puffin	*Fratercula arctica*
		Seabird Assemblage	*Waterfowl assemblage*
	Estuarine	Greenland White-fronted goose	*Anser albifrons flavirostris*
		European White-fronted goose	*Anser albifrons albifrons*
		Bewicks Swan	*Cygnus columbianus bewickii*
		Pintail	*Anas acuta*
		Teal	*Anas crecca*
		Gadwall	*Anas strepera*
		Curlew	*Numenius arquata*
		Oystercatcher	*Haematopus ostralegus*
		Redshank	*Tringa totanus*
		Shelduck	*Tadorna tadorna*
		Dunlin	*Calidris alpina alpina*
		Knot	*Calidris canutus*
		Grey Plover	*Pluvialis squatarola*
		Black-tailed godwit	*Limosa limosa islandica*
		Waterfowl assemblage	*Waterfowl assemblage*
	Coastal	Chough	*Pyrrhocorax pyrrhocorax*
SAC bat features	Woodland and grassland fringe	Lesser Horseshoe Bat	S1303 *Rhinolophus hipposideros*
		Greater Horseshoe Bat	S1304 *Rhinolophus ferrumequinum*
		Barbastelle Bat	S1308 *Barbastella barbastellus*

**Species are present within the freshwater and marine environment.