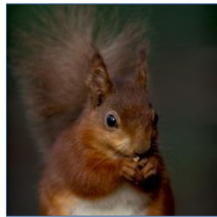


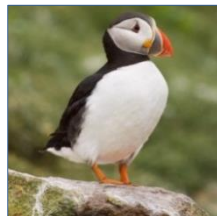
NATIONAL PARKS AND WILDLIFE SERVICE



CHECKLISTS OF PROTECTED AND THREATENED SPECIES IN IRELAND



Brian Nelson, Sinéad Cummins, Loraine Fay, Rebecca Jeffrey, Seán Kelly, Naomi Kingston, Neil Lockhart, Ferdia Marnell, David Tierney and Mike Wyse Jackson



An Roinn Cultúir,
Oidhreachta agus Gaeltachta
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Front cover, small photographs from top row:

Coastal heath, Howth Head, Co. Dublin, Maurice Eakin; **Red Squirrel** *Sciurus vulgaris*, Eddie Dunne, NPWS Image Library; **Marsh Fritillary** *Euphydryas aurinia*, Brian Nelson; **Puffin** *Fratercula arctica*, Mike Brown, NPWS Image Library; **Long Range and Upper Lake**, Killarney National Park, NPWS Image Library; **Limestone pavement**, Bricklieve Mountains, Co. Sligo, Andy Bleasdale; **Meadow Saffron** *Colchicum autumnale*, Lorcan Scott; **Barn Owl** *Tyto alba*, Mike Brown, NPWS Image Library; **A deep water fly trap anemone** *Phelliactis* sp., Yvonne Leahy; **Violet Crystalwort** *Riccia huebeneriana*, Robert Thompson

Main photograph:

Short-beaked Common Dolphin *Delphinus delphis*, Gary Burrows



Checklists of protected and threatened species in Ireland

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Executive Summary

This volume provides checklists of the plant and animal species that are afforded legal protection in Ireland, through the Nature Directives (Birds and Habitat Directives), and the Wildlife Acts and associated Statutory Instruments (e.g. the Flora (Protection) Order). Checklists are provided for the following groups

- Plants
 - Flowering Plants (Angiosperms)
 - Ferns and Fern-allies (Pteridophytes)
 - Hornworts and Liverworts
 - Mosses
 - Algae
 - Lichens
- Vertebrates
 - Mammals
 - Birds
 - Reptiles
 - Amphibians
 - Freshwater Fish
 - Cartilaginous Fish (Sharks, skates, rays and chimaeras)
- Insects
 - Bees (Hymenoptera, Apoidea)
 - Butterflies (Lepidoptera)
 - Damselflies and Dragonflies (Odonata)
 - Macro-moths (Lepidoptera)
 - Mayflies (Ephemeroptera)
 - Stoneflies (Plecoptera)
 - Water beetles (Aquatic Coleoptera)
- Invertebrates (other than insects)
 - Crayfish
 - Non-marine Mollusca

Each checklist also includes species that have been assessed as at risk of extinction on the island of Ireland using the IUCN Regional Red List criteria. All threatened species are listed, i.e. those categorised as Critically Endangered (CR), Endangered (EN) and Vulnerable (VU). Species assessed as Regionally Extinct (RE) and Near Threatened (NT) are also given in the checklists.

In total, 1,050 species are included in the checklists.

1 Introduction

Ferriss *et al.* (2009) produced a taxonomic overview of the marine, terrestrial and freshwater animal species recorded from the Republic of Ireland. This produced an approximate total of 19,000 species but recognised that this figure was likely to be a significant underestimate of the true diversity of Irish fauna. FitzPatrick *et al.* (2010) provided an upper estimate of the number of plants and fungi in Ireland to be in excess of 18,000 species.

A small number of these animal and plant species are protected under Irish legislation. The principal Irish legislation is the Wildlife Act 1976. Amendments to the Wildlife Act and its Statutory Instruments have enacted and amended protection of individual species, notably in order to comply with EU legislation or other international agreements. The Birds and Habitats Directives are the primary EU legislation resulting in the legal protection of species in Ireland. The Acts and Statutory Instruments which list species within the broad taxonomic groupings are referred to in the relevant sections. See also www.npws.ie/legislation. The full text of Irish legal Acts and Statutory Instruments are available from the electronic Irish Statute Book website www.irishstatutebook.ie.

The International Union for the Conservation of Nature (IUCN) coordinates the Red Listing process at the global level, defining the categories so that they are standardised across all taxa. Red Lists are also produced at regional, national and subnational levels using the same IUCN categories (IUCN 2012, 2019). Since 2009, Red Lists have been produced for the island of Ireland by the National Parks and Wildlife Service (NPWS) and the Northern Ireland Environment Agency (NIEA) using these IUCN categories. To date, 13 Red Lists have been completed. The 2006 bee Red List (FitzPatrick *et al.*, 2006) also followed the IUCN regional assessment guidelines. All these Red Lists are available to download from the website of the National Parks and Wildlife Service: www.npws.ie/publications/red-lists, and readers are referred to those publications for a full explanation of the assessments and the Red Listing process. Some earlier All-Ireland or Britain and Ireland Red Data books were produced using earlier iterations of the IUCN methodology (Curtis & McGough, 1988; Stewart & Church, 1992; Whilde, 1993). These are referred to if they provide the most recent assessment of the species group.

This volume provides a listing of the plant and animal species that are legally protected in Ireland, and/or Red Listed and, therefore, assessed as in danger of extinction, and/or assessed as Near Threatened and likely to qualify for a threat category in the future. Checklists are presented by taxonomic group and species within each group are listed alphabetically by scientific name.

The treatment of bird species in this checklist differs from other animal groups. All birds are protected by Irish national legislation so the bird checklist is limited to species included on Annex I of the EU Birds Directive and those listed on the latest Birds of Conservation Concern.

It should be stressed that Red Lists and lists of species protected by legislation are subject to reassessment. Whilst the most recent (at date of publication) such lists were used to compile the checklists provided here, readers are advised to regularly check the NPWS website for updated versions. See Section 2.6 for further information.

2 Explanation and key to tables

This Chapter provides a key to the abbreviations used in the checklists given in Chapters 3 to 5. Species are listed alphabetically by scientific name in each table. Synonyms are provided, in parentheses, for more familiar former names. Columns, from left to right, follow the general hierarchy of EU Directives, followed by national legislation and then Red List category (All-Ireland Red Lists), or in the case of birds, Birds of Conservation Concern (BoCCI) status.

2.1 EU Directives

The primary legislation transposing the Nature Directives (Birds and Habitats Directives) into Irish law is the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), as amended.

Table 1 Codes used for the EU Nature Directives, the Birds and Habitats Directives

Code	Explanation
EU HD	EU Habitats Directive (Council Directive 92/43/EEC)
II	Animal and plant species listed in Annex II
IV	Animal and plant species listed in Annex IV
V	Animal and plant species listed in Annex V
EU BD	EU Birds Directive (Council Directive 09/147/EC)
I	Bird species listed in Annex I

2.2 National legislation

The Wildlife Act 1976 (Number 39 of 1976) was amended on four occasions up to 2019, the principal being the Wildlife (Amendment) Act 2000 (Number 38 of 2000). The Flora (Protection) Order lists the plant species protected by Section 21 of the Wildlife Acts. The regulations that give rise to the protection of animal species under the Wildlife Acts are detailed in the relevant sections. See www.npws.ie/legislation for further information.

Table 2 Codes used for national legislation

Code	Explanation
WA	Wildlife Act, 1976, Wildlife (Amendment) Act, 2000 and other relevant amendments
FPO	Flora (Protection) Order, 2015 (S.I. No. 356 of 2015)

2.3 All-Ireland Red Lists

The Red Lists are an assessment of the risk of extinction of each species and not just an assessment of their rarity. Threatened species are those species categorised as Critically Endangered, Endangered or Vulnerable (IUCN, 2019) – also commonly referred to as ‘Red Listed’. All Red Listed species are included in each checklist, together with all the species categorised as Regionally Extinct and Near

Threatened. Where a species is included in the checklist for other reasons, e.g. protected through European or national legislation, and an assessment has been completed, the IUCN Red List category is given. A blank in the 'Red List Status' column means that the species is within a group that has not yet had a Red List assessment.

Red Lists in Ireland refer to the whole island, i.e. including Northern Ireland, and so follow the guidelines for regional assessments (IUCN, 2012, 2019). The abbreviations used within the individual tables are as per Table 3, with the exception of the charophyte algae (see Section 3.5). See the individual Red Lists and IUCN (2012, 2019) for a full explanation of the categories.

Table 3 IUCN Red List categories and their abbreviations

IUCN Code	IUCN Category
RE	Regionally Extinct
CR	Critically Endangered
EN	Endangered
VU	Vulnerable
NT	Near Threatened
DD	Data Deficient
LC	Least Concern
NA	Not Assessed
NE	Not Evaluated

Table 4 provides a list of the All-Ireland Red Lists published or in press since 2009. Note that the Mammals have been subject to two assessments.

Table 4 All-Ireland Red Lists published or in press since 2009

Number	Group	Citation
No. 1	Water beetles	Foster <i>et al.</i> (2009)
No. 2	Non-marine Molluscs	Byrne <i>et al.</i> (2009)
No. 3	Terrestrial Mammals	Marnell <i>et al.</i> (2009)
No. 4	Butterflies	Regan <i>et al.</i> (2010)
No. 5	Fish, Amphibians & Reptiles	King <i>et al.</i> (2011)
No. 6	Damselflies & Dragonflies (Odonata)	Nelson <i>et al.</i> (2011)
No. 7	Mayflies (Ephemeroptera)	Kelly-Quinn & Regan (2012)
No. 8	Bryophytes	Lockhart <i>et al.</i> (2012)
No. 9	Macro-moths (Lepidoptera)	Allen (2016)
No. 10	Vascular Plants	Wyse Jackson <i>et al.</i> (2016)
No. 11	Cartilaginous fish [sharks, skates, rays and chimaeras]	Clarke <i>et al.</i> (2016)
No. 12	Mammals	Marnell <i>et al.</i> (2019)
No. 13	Stoneflies (Plecoptera)	Feeley <i>et al.</i> (in press)

2.4 Birds of Conservation Concern in Ireland

The current status of the regularly occurring Irish bird species is assessed using the Birds of Conservation Concern (BoCCI) guidelines (Colhoun & Cummins, 2013). The last assessment covered the period 2014-2019 and all species assessed as Amber and Red are given in the checklist.

2.5 Licensing

Licences, or other consents, may be required in Ireland for work or activities that could affect the species listed in these checklists, or their habitat, breeding or resting places. The NPWS website (<https://www.npws.ie/licences>) should be consulted for further information on licences that may be issued by the Minister for Culture, Heritage and the Gaeltacht.

2.6 Updates to the checklists

The checklists will be updated, as and when required, including when relevant legislation and Red Lists are published. The checklists may also be updated to reflect nomenclatural changes. Checklist updates will be communicated through the associated MS Excel File at www.npws.ie/publications/irish-wildlife-manuals. The version accompanying this publication is IWM 116 Checklists Protected and Threatened Species Version 1.0 18 Dec 2019.xlsx. Changes among versions will be documented in the **READ_ME** Worksheet in the MS Excel File. Users are advised to regularly check the NPWS website to ensure they are using the current version. Citation of the MS Excel file name (in full) is also recommended. NPWS takes no responsibility for the use of out-of-date versions.

3 Plants

The checklists of species in this Chapter follow the broad interpretation of ‘plants’ included in the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), i.e. to include any seed plant, fern or fern-ally, lycophyte, bryophyte, charophyte, green alga, brown alga, red alga, fungus, slime-mould, lichen, actinomycete or cyanobacterium. The checklists are presented in the following order: Flowering plants (Angiosperms), Ferns and Fern-allies (Pteridophytes), Hornworts and Liverworts, Mosses, Algae, Lichens.

3.1 Flowering Plants (Angiosperms)

The latest Red List assessment of the Irish flowering plants is Wyse Jackson *et al.* (2016), the previous assessment of these being by Curtis & McGough (1988). Scientific names in this checklist (Table 5) follow Stace (2019). Common names follow those given in Scannell & Synnott (1987) and, where not included there, Stace (2019), followed by Sell & Murrell (2006) and Jebb (2019). Synonyms are provided for taxa for which recent nomenclatural/taxonomic research has necessitated changes to the scientific name, the more familiar former name being in parentheses. The relevant national legislation is the Wildlife Act (1976), as amended and the Flora (Protection) Order. The Flora (Protection) Order, 2015 (S.I. No. 356 of 2015) lists 60 flowering plant species. Species assessed as Regionally Extinct (RE) in Wyse Jackson *et al.* (2016) for which native population/s have since been discovered are indicated as RE* and those for which introduced, neophyte populations have since been discovered as RE*[^{neo}] (Table 5).

Table 5 Checklist of Flowering Plants (Angiosperms)

Species name	Common name	EU HD	FPO	Red List Status
<i>Achillea maritima</i> (<i>Otanthus maritimus</i>)	Cottonweed		FPO	CR
<i>Adoxa moschatellina</i>	Moschatel			CR
<i>Agrimonia procera</i>	Fragrant Agrimony			NT
<i>Ajuga pyramidalis</i>	Pyramidal Bugle			VU
<i>Alchemilla alpina</i>	Alpine Lady’s-mantle			VU
<i>Alchemilla glaucescens</i>	Silky Lady’s-mantle			VU
<i>Allium schoenoprasum</i>	Chives		FPO	VU
<i>Alopecurus aequalis</i>	Orange Foxtail		FPO	NT
<i>Althaea officinalis</i>	Marsh-mallow			NT
<i>Anacamptis morio</i> (<i>Orchis morio</i>)	Green-winged Orchid			VU
<i>Anthriscus caucalis</i>	Bur Chervil			NT
<i>Arabis petraea</i> (<i>Cardaminopsis petraea</i>)	Northern Rock-cress		FPO	VU
<i>Arbutus unedo</i>	Strawberry-tree			NT
<i>Arenaria ciliata</i>	Fringed Sandwort		FPO	VU
<i>Arenaria norvegica</i>	Arctic Sandwort			VU
<i>Aristavena setacea</i> (<i>Deschampsia setacea</i>)	Bog Hair-grass		FPO	NT
<i>Artemisia absinthium</i>	Wormwood			VU
<i>Asparagus prostratus</i> (<i>Asparagus officinalis</i> subsp. <i>prostratus</i>)	Wild Asparagus		FPO	EN
<i>Astragalus danicus</i>	Purple Milk-vetch		FPO	NT
<i>Ballota nigra</i>	Black Horehound			NT

Species name	Common name	EU HD	FPO	Red List Status
<i>Betonica officinalis</i> (<i>Stachys officinalis</i>)	Betony		FPO	NT
<i>Bistorta vivipara</i> (<i>Persicaria vivipara</i> ; <i>Polygonum viviparum</i>)	Alpine Bistort		FPO	VU
<i>Blitum bonus-henricus</i> (<i>Chenopodium bonus-henricus</i>)	Good-King-Henry			VU
<i>Blysmus rufus</i>	Saltmarsh Flat-sedge			NT
<i>Bromopsis erecta</i> (<i>Bromus erectus</i>)	Upright Brome			NT
<i>Bromus racemosus</i> [incl. <i>Bromus commutatus</i>]	Smooth Brome			NT
<i>Buglossoides arvensis</i> (<i>Lithospermum arvense</i>)	Field Gromwell			CR
<i>Calamagrostis epigejos</i>	Wood Small-reed		FPO	VU
<i>Calamagrostis stricta</i>	Narrow Small-reed			EN
<i>Callitriche palustris</i>	Narrow-fruited Water-starwort			VU
<i>Callitriche truncata</i>	Short-leaved Water-starwort		FPO	VU
<i>Cardamine impatiens</i>	Narrow-leaved Bitter-cress		FPO	EN
<i>Carduus tenuiflorus</i>	Slender Thistle			NT
<i>Carex acuta</i>	Slender Tufted-sedge			NT
<i>Carex appropinquata</i>	Fibrous Tussock-sedge			NT
<i>Carex buxbaumii</i>	Club Sedge			RE
<i>Carex depauperata</i>	Starved Wood-sedge		FPO	CR
<i>Carex divisa</i>	Divided Sedge		FPO	EN
<i>Carex elongata</i>	Elongated Sedge			NT
<i>Carex pauciflora</i>	Few-flowered Sedge			NT
<i>Carex spicata</i>	Spiked Sedge			NT
<i>Centaurea scabiosa</i>	Greater Knapweed			NT
<i>Centaurium littorale</i>	Seaside Centaury			VU
<i>Centaurium pulchellum</i>	Lesser Centaury		FPO	NT
<i>Cephalanthera longifolia</i>	Narrow-leaved Helleborine		FPO	VU
<i>Chaerophyllum temulum</i>	Rough Chervil			VU
<i>Chamaemelum nobile</i>	Chamomile			NT
<i>Chenopodium vulvaria</i>	Stinking Goosefoot			RE
<i>Cirsium heterophyllum</i>	Melancholy Thistle			CR
<i>Clinopodium acinos</i> (<i>Acinos arvensis</i>)	Basil Thyme		FPO	NT
<i>Coeloglossum viride</i>	Frog Orchid			NT
<i>Colchicum autumnale</i>	Meadow Saffron; Autumn Crocus		FPO	EN
<i>Crambe maritima</i>	Sea-kale			NT
<i>Cynoglossum officinale</i>	Hound's-tongue			NT
<i>Cytisus scoparius</i> subsp. <i>maritimus</i>	Prostrate Broom			VU
<i>Dasiphora fruticosa</i> (<i>Potentilla fruticosa</i>)	Shrubby Cinquefoil			VU
<i>Dianthus armeria</i>	Deptford Pink			EN
<i>Elatine hexandra</i>	Six-stamened Waterwort			NT
<i>Eleocharis parvula</i>	Dwarf Spike-rush			CR
<i>Epilobium alsinifolium</i>	Chickweed Willowherb		FPO	EN

Species name	Common name	EU HD	FPO	Red List Status
<i>Epipactis phyllanthes</i>	Green-flowered Helleborine			EN
<i>Erica vagans</i>	Cornish Heath			CR
<i>Eriocaulon aquaticum</i>	Pipewort			NT
<i>Eriophorum gracile</i>	Slender Cottongrass		FPO	NT
<i>Euphorbia exigua</i>	Dwarf Spurge			NT
<i>Euphorbia peplis</i>	Purple Spurge			RE
<i>Filago germanica (Filago vulgaris)</i>	Common Cudweed			VU
<i>Fumaria densiflora</i>	Dense-flowered Fumitory			RE*[^{neo}]]
<i>Galeopsis angustifolia</i>	Red Hemp-nettle		FPO	VU
<i>Galeopsis speciosa</i>	Large-flowered Hemp-nettle			NT
<i>Gentiana verna</i>	Spring Gentian			NT
<i>Gentianella amarella</i>	Autumn Gentian			NT
<i>Gentianella campestris</i>	Field Gentian			NT
<i>Geranium pratense</i>	Meadow Crane's-bill			VU
<i>Geranium purpureum</i>	Little-Robin			NT
<i>Geranium sylvaticum</i>	Wood Crane's-bill			EN
<i>Glaucium flavum</i>	Yellow Horned-poppy			NT
<i>Glebionis segetum (Chrysanthemum segetum)</i>	Corn Marigold			NT
<i>Groenlandia densa</i>	Opposite-leaved Pondweed		FPO	NT
<i>Hammarbya paludosa</i>	Bog Orchid		FPO	NT
<i>Helianthemum nummularium</i>	Common Rock-rose		FPO	CR
<i>Helianthemum oelandicum</i>	Hoary Rock-rose			NT
<i>Hieracium argentatum</i>	Killarney Hawkweed			VU
<i>Hieracium hartii</i>	Hart's Hawkweed			CR
<i>Hieracium hibernicum</i>	Irish Hawkweed			CR
<i>Hieracium scullyi</i>	Scully's Hawkweed			EN
<i>Hieracium sparsifrons</i>	Kerry Hawkweed			EN
<i>Hierochloa odorata</i>	Holy-grass			RE
<i>Hordelymus europaeus</i>	Wood Barley			CR
<i>Hordeum secalinum</i>	Meadow Barley		FPO	VU
<i>Hottonia palustris</i>	Water-violet			CR
<i>Hydrilla verticillata</i>	Hydrilla		FPO	EN
<i>Hyoscyamus niger</i>	Henbane			NT
<i>Hypericum canadense</i>	Irish St John's-wort		FPO	LC
<i>Hypericum hirsutum</i>	Hairy St John's-wort		FPO	VU
<i>Hypochaeris glabra</i>	Smooth Cat's-ear			EN
<i>Hypopitys monotropa</i>	Yellow Bird's-nest			NT
<i>Inula salicina</i>	Irish Fleabane		FPO	CR
<i>Juncus compressus</i>	Round-fruited Rush			CR
<i>Juncus filiformis</i>	Thread Rush			VU
<i>Lamium confertum</i>	Northern Dead-nettle			NT

Species name	Common name	EU HD	FPO	Red List Status
<i>Lathyrus japonicus</i>	Sea Pea		FPO	VU
<i>Lepidium latifolium</i>	Dittander			VU
<i>Ligusticum scoticum</i>	Scots Lovage			NT
<i>Limonium recurvum</i> subsp. <i>portlandicum</i>	Irish Sea-lavender			VU
<i>Limosella aquatica</i>	Mudwort		FPO	LC
<i>Linaria repens</i>	Pale Toadflax			NT
<i>Linaria vulgaris</i>	Common Toadflax			NT
<i>Linum bienne</i>	Pale Flax			NT
<i>Linum radiola</i> (<i>Radiola linoides</i>)	Allseed			NT
<i>Lithospermum officinale</i>	Common Gromwell			NT
<i>Logfia minima</i> (<i>Filago minima</i>)	Small Cudweed		FPO	NT
<i>Lolium temulentum</i>	Darnel			EN
<i>Lotus subbiflorus</i> (<i>Lotus hispidus</i>)	Hairy Bird's-foot-trefoil		FPO	NT
<i>Luronium natans</i>	Floating Water-plantain	II IV		NE
<i>Luzula pallescens</i> (<i>Luzula pallidula</i>)	Fen Wood-rush			RE
<i>Lycopsis arvensis</i> (<i>Anchusa arvensis</i>)	Bugloss			NT
<i>Lysimachia minima</i> (<i>Centunculus minimus</i>)	Chaffweed			NT
<i>Malva neglecta</i>	Dwarf Mallow			NT
<i>Matthiola sinuata</i>	Sea Stock			RE*
<i>Melampyrum sylvaticum</i>	Small Cow-wheat			EN
<i>Mentha pulegium</i>	Pennyroyal		FPO	EN
<i>Mertensia maritima</i>	Oysterplant		FPO	VU
<i>Mibora minima</i>	Early Sand-grass			VU
<i>Micranthes nivalis</i> (<i>Saxifraga nivalis</i>)	Alpine Saxifrage		FPO	CR
<i>Minuartia recurva</i>	Recurved Sandwort		FPO	VU
<i>Misopates orontium</i>	Lesser Snapdragon		FPO	EN
<i>Najas flexilis</i>	Slender Naiad	II IV	FPO	NT
<i>Neotinea maculata</i>	Dense-flowered Orchid			NT
<i>Oenanthe fistulosa</i>	Tubular Water-dropwort			NT
<i>Oenanthe pimpinelloides</i>	Corky-fruited Water-dropwort			NT
<i>Omalotheca sylvatica</i> (<i>Gnaphalium sylvaticum</i>)	Heath Cudweed		FPO	EN
<i>Ophrys insectifera</i>	Fly Orchid			NT
<i>Orobanche rapum-genistae</i>	Greater Broomrape			NT
<i>Orthilia secunda</i>	Serrated Wintergreen			VU
<i>Parapholis incurva</i>	Curved Hard-grass			EN
<i>Parentucellia viscosa</i>	Yellow Bartsia			NT
<i>Poa alpina</i>	Alpine Meadow-grass			EN
<i>Polygonum maritimum</i>	Sea Knotgrass			RE
<i>Pseudorchis albida</i>	Small-white Orchid		FPO	VU
<i>Puccinellia fasciculata</i>	Borrer's Saltmarsh-grass		FPO	NT
<i>Pyrola media</i>	Intermediate Wintergreen			NT

Species name	Common name	EU HD	FPO	Red List Status
<i>Pyrola minor</i>	Common Wintergreen			NT
<i>Pyrola rotundifolia</i>	Round-leaved Wintergreen			NT
<i>Pyrola rotundifolia</i> subsp. <i>maritima</i>	Round-leaved Wintergreen		FPO	VU
<i>Pyrola rotundifolia</i> subsp. <i>rotundifolia</i>	Round-leaved Wintergreen			NT
<i>Ranunculus baudotii</i>	Brackish Water-crowfoot			NT
<i>Ranunculus fluitans</i>	River Water-crowfoot			VU
<i>Ranunculus penicillatus</i> subsp. <i>pseudofluitans</i>	Stream Water-crowfoot			VU
<i>Ranunculus tripartitus</i>	Three-lobed Crowfoot			CR
<i>Rhynchospora fusca</i>	Brown Beak-sedge			NT
<i>Roemeria argemone</i> (<i>Papaver argemone</i>)	Prickly Poppy			VU
<i>Roemeria hispida</i> (<i>Papaver hybridum</i>)	Rough Poppy		FPO	RE*[^{neo}]]
<i>Rubus chamaemorus</i>	Cloudberry			CR
<i>Rumex acetosa</i> subsp. <i>hibernicus</i>	Irish Sorrel			NT
<i>Rumex maritimus</i>	Golden Dock			NT
<i>Rumex pulcher</i>	Fiddle Dock			VU
<i>Salix herbacea</i>	Dwarf Willow			NT
<i>Salix phylicifolia</i>	Tea-leaved Willow			EN
<i>Sanguisorba officinalis</i>	Great Burnet		FPO	VU
<i>Sarcocornia perennis</i> (<i>Arthrocnemon perenne</i>)	Perennial Glasswort		FPO	VU
<i>Saussurea alpina</i>	Alpine Saw-wort			VU
<i>Saxifraga granulata</i>	Meadow Saxifrage		FPO	RE*
<i>Saxifraga hirculus</i>	Marsh Saxifrage	II IV	FPO	NT
<i>Saxifraga rosacea</i>	Irish Saxifrage			NT
<i>Saxifraga rosacea</i> subsp. <i>hartii</i> (<i>Saxifraga hartii</i>)	Hart's Saxifrage		FPO	VU
<i>Saxifraga rosacea</i> subsp. <i>rosacea</i>	Irish Saxifrage			NT
<i>Scandix pecten-veneris</i>	Shepherd's-needle			RE
<i>Scheuchzeria palustris</i>	Rannoch-rush			RE
<i>Schoenoplectus triqueter</i> (<i>Scirpus triqueter</i>)	Triangular Club-rush		FPO	NT
<i>Scirpus sylvaticus</i>	Wood Club-rush			NT
<i>Scleranthus annuus</i>	Annual Knawel		FPO	VU
<i>Scrophularia umbrosa</i>	Green Figwort			NT
<i>Serratula tinctoria</i>	Saw-wort			RE
<i>Silene gallica</i>	Small-flowered Catchfly			VU
<i>Silybum marianum</i>	Milk Thistle			NT
<i>Simethis mattiazzii</i> (<i>Simethis planifolia</i>)	Kerry Lily		FPO	NT
<i>Sorbus anglica</i>	English Whitebeam			EN
<i>Sorbus devoniensis</i>	Devon Whitebeam			EN
<i>Sorbus hibernica</i>	Irish Whitebeam			VU
<i>Sorbus rupicola</i>	Rock Whitebeam			VU
<i>Sorbus scannelliana</i>	Scannell's Whitebeam			CR
<i>Sparganium natans</i>	Least Bur-reed			NT

Species name	Common name	EU HD	FPO	Red List Status
<i>Spiranthes romanzoffiana</i>	Irish Lady's-tresses		FPO	NT
<i>Spiranthes spiralis</i>	Autumn Lady's-tresses			NT
<i>Subularia aquatica</i>	Awlwort			VU
<i>Teesdalia nudicaulis</i>	Shepherd's Cress			EN
<i>Torilis nodosa</i>	Knotted Hedge-parsley			NT
<i>Trifolium glomeratum</i>	Clustered Clover		FPO	EN
<i>Trifolium scabrum</i>	Rough Clover			NT
<i>Trifolium subterraneum</i>	Subterranean Clover		FPO	VU
<i>Trocaris verticillata</i> (<i>Carum verticillatum</i>)	Whorled Caraway			NT
<i>Trollius europaeus</i>	Globeflower		FPO	NT
<i>Valerianella dentata</i>	Narrow-fruited Cornsalad			VU
<i>Valerianella rimosa</i>	Broad-fruited Cornsalad			CR
<i>Verbena officinalis</i>	Vervain			NT
<i>Veronica agrestis</i>	Green Field-speedwell			NT
<i>Vicia orobus</i>	Wood Bitter-vetch		FPO	VU
<i>Viola hirta</i>	Hairy Violet		FPO	VU
<i>Viola lactea</i>	Pale Dog-violet		FPO	VU
<i>Viola lutea</i>	Mountain Pansy			VU
<i>Viola stagnina</i> (<i>Viola persicifolia</i>)	Fen Violet			NT
<i>Wahlenbergia hederacea</i>	Ivy-leaved Bellflower			NT

3.2 Ferns and Fern-allies (Pteridophytes)

The latest Red List assessment of the Irish ferns and fern-allies is Wyse Jackson *et al.* (2016), the previous assessment of these being by Curtis and McGough (1988). Scientific names in this checklist (Table 6) follow Stace (2019). The scientific name for Killarney Fern used in other recent works is provided in parentheses. Common names follow those given in Scannell & Synnott (1987). The relevant national legislation is the Wildlife Act (1976), as amended, and the Flora (Protection) Order. The Flora (Protection) Order, 2015 (S.I. No. 356 of 2015) lists one hybrid and seven species of ferns and fern-allies.

Table 6 Checklist of Ferns and Fern-allies (Pteridophytes)

Species name	Common name	EU HD	FPO	Red List Status
<i>Asplenium obovatum</i>	Lanceolate Spleenwort		FPO	VU
<i>Asplenium onopteris</i>	Irish Spleenwort			VU
<i>Asplenium septentrionale</i>	Forked Spleenwort		FPO	VU
<i>Botrychium lunaria</i>	Moonwort			NT
<i>Cryptogramma crispa</i>	Parsley Fern		FPO	VU
<i>Diphasiastrum alpinum</i>	Alpine Clubmoss	V		NT
<i>Dryopteris remota</i>	Scaly Buckler-fern			RE
<i>Equisetum</i> x <i>moorei</i> (<i>Equisetum hyemale</i> x <i>E. ramosissimum</i>)	Moore's Horsetail		FPO	NT
<i>Gymnocarpium dryopteris</i>	Oak Fern			RE
<i>Gymnocarpium robertianum</i>	Limestone Fern		FPO	CR
<i>Huperzia selago</i>	Fir Clubmoss	V		LC
<i>Isoetes echinospora</i>	Spring Quillwort			NT
<i>Lycopodiella inundata</i>	Marsh Clubmoss	V	FPO	VU
<i>Lycopodium clavatum</i>	Stag's-horn Clubmoss	V		NT
<i>Ophioglossum azoricum</i>	Small Adder's-tongue			NT
<i>Phegopteris connectilis</i>	Beech Fern			NT
<i>Pilularia globulifera</i>	Pillwort		FPO	VU
<i>Polystichum lonchitis</i>	Holly Fern			VU
<i>Thelypteris palustris</i>	Marsh Fern			NT
<i>Trichomanes speciosum</i> (<i>Vandenboschia speciosa</i>)	Killarney Fern	II IV	FPO	LC

3.3 Hornworts and Liverworts

The latest Red List assessment of the Irish hornworts and liverworts is Lockhart *et al.* (2012). The relevant national legislation is the Wildlife Act (1976), as amended, and the Flora (Protection) Order. The Flora (Protection) Order, 2015 (S.I. No. 356 of 2015) lists 25 species of liverworts. Species assessed as RE in Lockhart *et al.* (2012) for which native population/s have since been discovered are indicated as RE*. The checklist of hornworts and liverworts is given in Table 7; all species are liverworts except the hornwort *Anthoceros agrestis*, which is listed first. Nomenclature follows Lockhart *et al.* (2012).

Table 7 Checklist of Hornworts and Liverworts

Species name	Common name	EU HD	FPO	Red List Status
<i>Anthoceros agrestis</i>				VU
<i>Acrobolbus wilsonii</i>	Wilson's Pouchwort		FPO	VU
<i>Adelanthus lindenbergianus</i>	Lindenberg's Featherwort		FPO	VU
<i>Anastrophyllum hellerianum</i>				RE
<i>Aneura mirabilis</i>				VU
<i>Anthelia juratzkana</i>				NT
<i>Barbilophozia atlantica</i>	Atlantic Pawwort		FPO	EN
<i>Barbilophozia barbata</i>				CR
<i>Barbilophozia kunzeana</i>				RE
<i>Bazzania pearsonii</i>	Arch-leaved Whipwort		FPO	VU
<i>Calypogeia integristipula</i>				EN
<i>Calypogeia suecica</i>				RE*
<i>Cephalozia crassifolia</i>	Irish Pincerwort		FPO	EN
<i>Cephalozia loitlesbergeri</i>				VU
<i>Cephalozia pleniceps</i>				VU
<i>Cephaloziella integerrima</i>				VU
<i>Cephaloziella massalongi</i>	Lesser Copperwort		FPO	VU
<i>Cephaloziella nicholsonii</i>	Greater Copperwort		FPO	VU
<i>Cephaloziella rubella</i>				VU
<i>Cephaloziella stellulifera</i>				NT
<i>Cephaloziella turneri</i>				VU
<i>Cladopodiella francisci</i>				VU
<i>Diplophyllum obtusifolium</i>				NT
<i>Douinia ovata</i>				NT
<i>Dumortiera hirsuta</i>				NT
<i>Eremonotus myriocarpus</i>				NT
<i>Fossombronia fimbriata</i>				VU
<i>Fossombronia maritima</i>				NT
<i>Geocalyx graveolens</i>	Turps Pouchwort; Turpswort		FPO	EN
<i>Gymnomitrium concinnatum</i>	Braided Frostwort		FPO	EN
<i>Gymnomitrium corallioides</i>	Coral Frostwort		FPO	CR
<i>Gymnomitrium obtusum</i>				NT
<i>Kurzia sylvatica</i>				NT
<i>Leiocolea bantriensis</i>				NT
<i>Leiocolea fitzgeraldiae</i>				NT
<i>Leiocolea gillmanii</i>	Gillman's Notchwort		FPO	VU
<i>Leiocolea heterocolpos</i>				CR
<i>Leiocolea rutheana</i> var. <i>rutheana</i>	Lesser Fen Notchwort		FPO	EN
<i>Lejeunea eckloniana</i>				NT
<i>Lejeunea flava</i> subsp. <i>moorei</i>				VU

Species name	Common name	EU HD	FPO	Red List Status
<i>Lejeunea hibernica</i>	Irish Pouncewort		FPO	NT
<i>Lejeunea mandonii</i>	Atlantic Pouncewort		FPO	EN
<i>Lophozia opacifolia</i>				VU
<i>Marchantia polymorpha</i> subsp. <i>montivagans</i>	Mountain Liverwort		FPO	EN
<i>Marsupella adusta</i>				NT
<i>Marsupella funckii</i>				NT
<i>Marsupella sphacelata</i>				VU
<i>Marsupella sprucei</i>				VU
<i>Mastigophora woodsia</i>	Wood's Whipwort		FPO	NT
<i>Metzgeria leptoneura</i>				NT
<i>Metzgeria pubescens</i>				VU
<i>Nardia geoscyphus</i>				NT
<i>Odontoschisma elongatum</i>				NT
<i>Pallavicinia lyellii</i>	Ribbonwort; Veilwort		FPO	EN
<i>Petalophyllum ralfsii</i>	Petalwort	II	FPO	LC
<i>Plagiochila carringtonii</i>	Carrington's Featherwort		FPO	EN
<i>Plagiochila heterophylla</i>	Western Featherwort		FPO	EN
<i>Porella cordaeana</i>				NT
<i>Ptilidium pulcherrimum</i>				RE
<i>Radula carringtonii</i>				NT
<i>Radula holtii</i>	Holt's Scalewort		FPO	NT
<i>Riccia crozalsii</i>	Ciliate Crystalwort		FPO	EN
<i>Ricciocarpos natans</i>				NT
<i>Scapania curta</i>				VU
<i>Scapania cuspiduligera</i>				VU
<i>Scapania gymnostomophila</i>				VU
<i>Scapania nimbosea</i>	Cloud Earwort		FPO	EN
<i>Scapania ornithopodioides</i>	Bird's-foot Earwort		FPO	VU
<i>Solenostoma paroicum</i>				NT
<i>Solenostoma sphaerocarpum</i>				NT
<i>Solenostoma subellipticum</i>				NT
<i>Southbya tophacea</i>	Green Blackwort		FPO	CR
<i>Sphenolobopsis pearsonii</i>				NT
<i>Targionia hypophylla</i>				RE
<i>Telaranea europaea</i>				NT
<i>Tritomaria exsecta</i>				VU

3.4 Mosses

The latest Red List assessment of the Irish mosses is Lockhart *et al.* (2012). Species assessed as RE in Lockhart *et al.* (2012) for which native population/s have since been discovered are indicated as RE*. The relevant national legislation is the Wildlife Act (1976), as amended, and the Flora (Protection) Order. The Flora (Protection) Order, 2015 (S.I. No. 356 of 2015) lists 40 species of mosses. All members of the bryophyte family Sphagnaceae in Ireland are protected under Annex V of the EU Habitats Directive (92/43/EEC). The total number of *Sphagnum* species recorded from Ireland is 30 but only those which are on the Irish Red List are included in Table 8 below. Nomenclature follows Lockhart *et al.* (2012).

Table 8 Checklist of Mosses

Species name	Common name	EU HD	FPO	Red List Status
<i>Abietinella abietina</i> var. <i>abietina</i>				EN
<i>Abietinella abietina</i> var. <i>hystricosa</i>				NT
<i>Acaulon muticum</i>				RE
<i>Aloina ambigua</i>				EN
<i>Aloina rigida</i>				RE
<i>Amblystegium confervoides</i>				NT
<i>Amphidium lapponicum</i>				VU
<i>Andreaea megistospora</i>				VU
<i>Antitrichia curtipendula</i>				NT
<i>Aongstroemia longipes</i>				CR
<i>Arctoa fulvella</i>				VU
<i>Atrichum angustatum</i>				RE
<i>Atrichum tenellum</i>				NT
<i>Aulacomnium androgynum</i>				VU
<i>Bartramia halleriana</i>	Haller's Apple-moss		FPO	RE*
<i>Bartramia ithyphylla</i>				VU
<i>Brachydontium trichodes</i>	Bristle-leaf		FPO	EN
<i>Brachytheciastrum velutinum</i>				EN
<i>Bryum bornholmense</i>				NT
<i>Bryum caespiticium</i>				VU
<i>Bryum calophyllum</i>	Blunt Bryum; Matted Bryum		FPO	EN
<i>Bryum dyffrynense</i>				NT
<i>Bryum elegans</i>				VU
<i>Bryum gemmiparum</i>				VU
<i>Bryum intermedium</i>	Many-seasoned Thread-moss		FPO	EN
<i>Bryum knowltonii</i>	Knowlton's Thread-moss		FPO	EN
<i>Bryum moravicum</i>				CR
<i>Bryum riparium</i>				EN
<i>Bryum salinum</i>	Saltmarsh Thread-moss		FPO	CR
<i>Bryum torquescens</i>				VU
<i>Bryum turbinatum</i>				RE

Species name	Common name	EU HD	FPO	Red List Status
<i>Bryum uliginosum</i>	Ceruous Thread-moss		FPO	EN
<i>Bryum warneum</i>	Warne's Thread-moss; Sea Bryum		FPO	EN
<i>Buxbaumia aphylla</i>				RE
<i>Campyliadelphus elodes</i>				NT
<i>Campylopus atrovirens</i> var. <i>falcatus</i>				NT
<i>Campylopus schimperi</i>				RE
<i>Campylopus shawii</i>				NT
<i>Campylopus subulatus</i>				VU
<i>Campylostelium saxicola</i>	Bent-moss		FPO	EN
<i>Catoscopium nigratum</i>	Down-looking Moss; Golf-club Moss		FPO	NT
<i>Cinclidium stygium</i>				VU
<i>Conardia compacta</i>				RE
<i>Ctenidium molluscum</i> var. <i>robustum</i>				RE
<i>Cyclodictyon laetevirens</i>				NT
<i>Cynodontium jenneri</i>				VU
<i>Dicranella cerviculata</i>				NT
<i>Dicranella crispa</i>				EN
<i>Dicranella grevilleana</i>				NT
<i>Dicranodontium asperulum</i>				VU
<i>Dicranodontium uncinatum</i>				VU
<i>Dicranum undulatum</i>				RE*
<i>Didymodon acutus</i>	Pointed Beard-moss		FPO	EN
<i>Didymodon icmadophilus</i>				RE
<i>Didymodon maximus</i>	Irish Beard-moss		FPO	NT
<i>Didymodon tomaculosus</i>				VU
<i>Didymodon umbrosus</i>				VU
<i>Discelium nudum</i>				NT
<i>Ditrichum cornubicum</i>	Cornish Path-moss		FPO	CR
<i>Ditrichum lineare</i>	Dark Ditrichum		FPO	CR
<i>Ditrichum plumbicola</i>	Lead-moss		FPO	EN
<i>Ditrichum zonatum</i>				EN
<i>Drepanocladus sendtneri</i>				NT
<i>Encalypta alpina</i>				VU
<i>Encalypta ciliata</i>	Fringed Extinguisher-moss		FPO	CR
<i>Encalypta rhaptocarpa</i>	Ribbed Extinguisher-moss		FPO	CR
<i>Encalypta vulgaris</i>				NT
<i>Entosthodon fascicularis</i>				NT
<i>Entosthodon muhlenbergii</i>	Muhlenberg's Cord-moss		FPO	RE
<i>Ephemerum cohaerens</i>	Clustered Earth-moss		FPO	VU

Species name	Common name	EU HD	FPO	Red List Status
<i>Ephemerum crassinervium</i> subsp. <i>rutheanum</i>				NT
<i>Ephemerum crassinervium</i> subsp. <i>sessile</i>				NT
<i>Ephemerum spinulosum</i>	Prickly Earth-moss		FPO	EN
<i>Eurhynchiastrum pulchellum</i> var. <i>diversifolium</i>				RE
<i>Fissidens curvatus</i>				RE
<i>Fissidens exilis</i>				VU
<i>Fissidens fontanus</i>				VU
<i>Fissidens monguillonii</i>				NT
<i>Fissidens polyphyllus</i>				VU
<i>Fissidens rivularis</i>				VU
<i>Fissidens rufulus</i>	Beck Pocket-moss		FPO	EN
<i>Fissidens serrulatus</i>				VU
<i>Fontinalis antipyretica</i> var. <i>gracilis</i>				NT
<i>Grimmia anomala</i>				EN
<i>Grimmia atrata</i>	Copper Grimmia		FPO	EN
<i>Grimmia crinita</i>				RE
<i>Grimmia decipiens</i>				NT
<i>Grimmia dissimulata</i>				VU
<i>Grimmia donniana</i>				NT
<i>Grimmia funalis</i>				NT
<i>Grimmia laevigata</i>				RE
<i>Grimmia longirostris</i>				RE*
<i>Grimmia orbicularis</i>				VU
<i>Grimmia ramondii</i>				NT
<i>Grimmia torquata</i>				NT
<i>Hageniella micans</i>				NT
<i>Hamatocaulis vernicosus</i>	Shining Sickle Moss; Varnished Hook-moss; Slender Green Feather-moss	II	FPO	NT
<i>Hedwigia ciliata</i> var. <i>ciliata</i>				VU
<i>Hedwigia integrifolia</i>	Green Hoar-moss		FPO	VU
<i>Heterocladium wulfsbergii</i>				NT
<i>Hygroamblystegium fluviatile</i>				NT
<i>Hygroamblystegium humile</i>				EN
<i>Hygroamblystegium varium</i>				NT
<i>Hygrohypnum duriusculum</i>	Broad-leaved Brook-moss		FPO	CR
<i>Hylocomiastrum umbratum</i>				NT
<i>Hymenostylium recurvirostrum</i> var. <i>insigne</i>				NT
<i>Hypnum callichroum</i>				NT

Species name	Common name	EU HD	FPO	Red List Status
<i>Hypnum uncinulatum</i>	Hooked Plait-moss		FPO	NT
<i>Isopterygiopsis muelleriana</i>				VU
<i>Kiaeria falcata</i>	Sickle-leaved Fork-moss		FPO	CR
<i>Leptobarbula berica</i>				VU
<i>Leptodon smithii</i>	Prince-of-Wales Feather-moss		FPO	EN
<i>Leptodontium flexifolium</i>				NT
<i>Leucobryum glaucum</i>	White Cushion Moss	V		LC
<i>Meesia triquetra</i>	Three-ranked Hump-moss		FPO	RE*
<i>Meesia uliginosa</i>	Broad-nerved Hump-moss		FPO	EN
<i>Microbryum curvicolium</i>				RE
<i>Microbryum starckeanum</i>				RE
<i>Mnium thomsonii</i>				NT
<i>Molendoa warburgii</i>	Warburg's Moss		FPO	VU
<i>Myurella julacea</i>	Small Mouse-tail Moss		FPO	EN
<i>Myurium hochstetteri</i>				RE
<i>Oedipodium griffithianum</i>	Gouty-moss		FPO	CR
<i>Orthodontium gracile</i>				CR
<i>Orthothecium rufescens</i>				NT
<i>Orthotrichum pallens</i>				EN
<i>Orthotrichum rivulare</i>				NT
<i>Orthotrichum sprucei</i>	Spruce's Bristle-moss		FPO	VU
<i>Orthotrichum stramineum</i>				VU
<i>Oxyrrhynchium schleicheri</i>				CR
<i>Oxyrrhynchium speciosum</i>				NT
<i>Paludella squarrosa</i>	Tufted Fen-moss		FPO	CR
<i>Paraleptodontium recurvifolium</i>				NT
<i>Philonotis arnellii</i>				EN
<i>Philonotis caespitosa</i>				NT
<i>Philonotis cernua</i>				CR
<i>Philonotis rigida</i>				VU
<i>Philonotis tomentella</i>				VU
<i>Physcomitrium sphaericum</i>				VU
<i>Plagiobryum zieri</i>				NT
<i>Plagiomnium cuspidatum</i>				NT
<i>Plagiopus oederianus</i>				CR
<i>Plagiothecium cavifolium</i>				VU
<i>Plagiothecium curvifolium</i>				VU
<i>Plagiothecium denticulatum</i> var. <i>obtusifolium</i>				NT
<i>Plagiothecium laetum</i>				VU
<i>Plagiothecium latebricola</i>				VU

Species name	Common name	EU HD	FPO	Red List Status
<i>Plagiothecium platyphyllum</i>				VU
<i>Plasteurhynchium striatulum</i>				NT
<i>Platydictya jungermannioides</i>				NT
<i>Platyhypnidium lusitanicum</i>				NT
<i>Pleurochaete squarrosa</i>				NT
<i>Pogonatum nanum</i>				EN
<i>Pohlia andalusica</i>	Roth's Thread-moss		FPO	EN
<i>Pohlia elongata</i> var. <i>elongata</i>				NT
<i>Pohlia elongata</i> var. <i>greenii</i>				EN
<i>Pohlia filum</i>				VU
<i>Pohlia proligera</i>				RE
<i>Pohlia wahlenbergii</i> var. <i>glacialis</i>				RE
<i>Pseudocalliergon lycopodioides</i>				VU
<i>Pseudocalliergon trifarium</i>				VU
<i>Pterigynandrum filiforme</i>				RE
<i>Pterygoneurum lamellatum</i>				RE
<i>Pterygoneurum ovatum</i>				RE
<i>Ptilium crista-castrensis</i>	Ostrich-plume Feather-moss		FPO	CR
<i>Racomitrium canescens</i>				VU
<i>Racomitrium elongatum</i>				VU
<i>Racomitrium macounii</i> subsp. <i>alpinum</i>				VU
<i>Rhabdoweisia crispata</i>				NT
<i>Rhabdoweisia fugax</i>				VU
<i>Rhizomnium pseudopunctatum</i>				NT
<i>Rhodobryum roseum</i>				NT
<i>Rhynchostegiella curviseta</i>				RE
<i>Rhynchostegium megapolitanum</i>				NT
<i>Rhytidiadelphus subpinnatus</i>				RE
<i>Rhytidium rugosum</i>				VU
<i>Schistidium agassizii</i>				VU
<i>Schistidium platyphyllum</i>				VU
<i>Schistidium strictum</i>				NT
<i>Schistidium trichodon</i>				VU
<i>Scleropodium cespitans</i>				NT
<i>Scleropodium touretii</i>	Glass-wort Feather-moss		FPO	EN
<i>Scopelophila cataractae</i>				VU
<i>Seligeria calcarea</i>				VU
<i>Seligeria calycina</i>				RE
<i>Seligeria oelandica</i>				VU
<i>Seligeria patula</i>				NT
<i>Sematophyllum demissum</i>				NT

Species name	Common name	EU HD	FPO	Red List Status
<i>Sematophyllum substrumosum</i>				VU
<i>Sphagnum</i> ALL SPECIES		V		
<i>Sphagnum affine</i>		V		VU
<i>Sphagnum flexuosum</i>		V		VU
<i>Sphagnum girgensohnii</i>		V		NT
<i>Sphagnum platyphyllum</i>		V		NT
<i>Sphagnum russowii</i>		V		NT
<i>Sphagnum subsecundum</i>		V		NT
<i>Sphagnum teres</i>		V		NT
<i>Sphagnum warnstorffii</i>		V		VU
<i>Syntrichia princeps</i>				RE
<i>Tayloria tenuis</i>				RE
<i>Tetradontium brownianum</i>				NT
<i>Thuidium recognitum</i>				VU
<i>Timmia norvegica</i>				VU
<i>Tomentypnum nitens</i>				VU
<i>Tortella densa</i>				NT
<i>Tortella inclinata</i>	Bent Crisp-moss		FPO	EN
<i>Tortula atrovirens</i>				NT
<i>Tortula cuneifolia</i>				CR
<i>Tortula lanceola</i>				CR
<i>Tortula marginata</i>				NT
<i>Tortula modica</i>				VU
<i>Tortula protobryoides</i>				RE
<i>Tortula vahlana</i>				RE
<i>Tortula wilsonii</i>				RE
<i>Ullota coarctata</i>	Club Pincushion		FPO	CR
<i>Ullota drummondii</i>				RE
<i>Weissia longifolia</i> var. <i>angustifolia</i>				VU
<i>Weissia rostellata</i>				NT
<i>Weissia rutilans</i>				VU

3.5 Algae

The latest Red List assessment for the Irish charophytes is Stewart & Church (1992). Names used for charophytes in Table 9 follow Stewart & Church (1992) and Bryant & Stewart (2011). Stewart & Church (1992) used a previous IUCN assessment system and categories, which are denoted by the following abbreviations: Ex=Extinct, E=Endangered, V=Vulnerable; R=Rare; I=Indeterminate (E, V or R but not enough information to say which). Other species of algae have not been assessed. The relevant national legislation is the Wildlife Act (1976), as amended, and the Flora (Protection) Order. The Flora (Protection) Order, 2015 (S.I. No. 356 of 2015) lists two species of charophyte.

Table 9 Checklist of Algae

Species name	Common name	EU HD	FPO	Red List Status
<i>Chara canescens</i>	Bearded Stonewort			V
<i>Chara connivens</i>	Convergent Stonewort			I
<i>Chara denudata</i>	Naked Stonewort			R
<i>Chara muscosa</i>	Mossy Stonewort			Ex
<i>Chara tomentosa</i>	Coral Stonewort			R
<i>Lamprothamnium papulosum</i>	Foxtail Stonewort		FPO	V
<i>Lithothamnion corralloides</i>	Maërl	V		
<i>Nitella gracilis</i>	Slender Stonewort		FPO	V
<i>Nitella mucronata</i>	Pointed Stonewort			R
<i>Nitella spanioclema</i>	Few-branched Stonewort			I
<i>Nitella tenuissima</i>	Dwarf Stonewort			V
<i>Phymatolithon calcareum</i>	Maërl	V		
<i>Tolypella intricata</i>	Tassel Stonewort			V
<i>Tolypella prolifera</i>	Great Tassel Stonewort			Ex

3.6 Lichens

A Red List assessment of the Irish lichen species has not been completed. Five species of the genus *Cladonia* subgenus *Cladina* (a grouping that is not now universally accepted), Reindeer Lichens or Reindeer Mosses, occur in Ireland and are protected under Annex V of the EU Habitats Directive (92/43/EEC). The relevant national legislation is the Wildlife Act (1976), as amended, and the Flora (Protection) Order. The Flora (Protection) Order, 2015 (S.I. No. 356 of 2015) lists a single species of lichen. Nomenclature follows Smith *et al.* (2009).

Table 10 Checklist of Lichens

Species name	Common name	EU HD	FPO
<i>Cladonia arbuscula</i>		V	
<i>Cladonia azorica</i>		V	
<i>Cladonia ciliata</i>		V	
<i>Cladonia portentosa</i>		V	
<i>Cladonia rangiferina</i>		V	
<i>Fulgensia fulgens</i>	Scrambled-egg Lichen		FPO

4 Vertebrates

The vertebrate checklists are presented in the following order: mammals, birds, reptiles, amphibians, freshwater fish, cartilaginous fish (sharks, skates, rays and chimaeras).

4.1 Mammals

The Red List of Irish terrestrial mammals was updated in 2019 (Marnell *et al.*, 2019). This assessment included seals but did not cover the cetaceans. All species of cetaceans are fully protected in Irish waters by national and European legislation. The relevant national legislation is the Wildlife Act (1976), as amended. All cetaceans and all bats are protected under Annex IV of the EU Habitats Directive, but only established Irish species are listed below. Harbour Porpoise, Common Bottlenose Dolphin, Grey Seal, Harbour Seal, Otter and Lesser Horseshoe Bat are also protected under Annex II of the EU Habitats Directive. Nomenclature follows Wilson & Reeder (2005).

Table 11 Checklist of Mammals

Species name	Common name	EU HD	WA	Red List Status
<i>Balaenoptera acutorostrata</i>	Minke Whale	IV	WA	NE
<i>Balaenoptera borealis</i>	Sei Whale	IV	WA	NE
<i>Balaenoptera musculus</i>	Blue Whale	IV	WA	NE
<i>Balaenoptera physalus</i>	Fin Whale	IV	WA	NE
<i>Canis lupus</i>	Grey Wolf			RE
<i>Cervus elaphus</i>	Red Deer		WA	LC
<i>Cervus nippon</i>	Sika Deer		WA	NA
<i>Dama dama</i>	Fallow Deer		WA	LC
<i>Delphinapterus leucas</i>	Beluga/White Whale	IV	WA	NE
<i>Delphinus delphis</i>	Short-beaked Common Dolphin	IV	WA	NE
<i>Erinaceus europaeus</i>	Hedgehog		WA	LC
<i>Eubalaena glacialis</i>	Northern Right Whale	IV	WA	NE
<i>Globicephala melas</i>	Long-finned Pilot Whale	IV	WA	NE
<i>Grampus griseus</i>	Risso's Dolphin	IV	WA	NE
<i>Halichoerus grypus</i>	Grey Seal	II V	WA	LC
<i>Hyperoodon ampullatus</i>	Northern Bottlenose Whale	IV	WA	NE
<i>Kogia breviceps</i>	Pygmy Sperm Whale	IV	WA	NE
<i>Lagenorhynchus acutus</i>	White-sided Dolphin	IV	WA	NE
<i>Lagenorhynchus albirostris</i>	White-beaked Dolphin	IV	WA	NE
<i>Lepus europaeus</i>	Brown Hare		WA	NA
<i>Lepus timidus</i>	Irish/Mountain Hare		V WA	LC
<i>Lutra lutra</i>	Otter	II IV	WA	LC
<i>Martes martes</i>	Pine Marten		V WA	LC
<i>Megaptera novaeangliae</i>	Humpback Whale	IV	WA	NE
<i>Meles meles</i>	Badger		WA	LC
<i>Mesoplodon bidens</i>	Sowerby's Beaked Whale	IV	WA	NE

Species name	Common name	EU HD	WA	Red List Status
<i>Mesoplodon europaeus</i>	Gervais' Beaked Whale	IV	WA	NE
<i>Mesoplodon mirus</i>	True's Beaked Whale	IV	WA	NE
<i>Mustela erminea</i>	Stoat		WA	LC
<i>Myotis daubentoni</i>	Daubenton's Bat	IV	WA	LC
<i>Myotis mystacinus</i>	Whiskered Bat	IV	WA	LC
<i>Myotis nattereri</i>	Natterer's Bat	IV	WA	LC
<i>Nyctalus leisleri</i>	Leisler's Bat	IV	WA	LC
<i>Orcinus orca</i>	Killer Whale	IV	WA	NE
<i>Phoca vitulina</i>	Harbour Seal	II V	WA	LC
<i>Phocoena phocoena</i>	Harbour Porpoise	II IV	WA	NE
<i>Physeter macrocephalus</i>	Sperm Whale	IV	WA	NE
<i>Pipistrellus nathusii</i>	Nathusius' Pipistrelle	IV	WA	LC
<i>Pipistrellus pipistrellus</i>	Common Pipistrelle	IV	WA	LC
<i>Pipistrellus pygmaeus</i>	Soprano Pipistrelle	IV	WA	LC
<i>Plecotus auritus</i>	Brown Long-eared Bat	IV	WA	LC
<i>Pseudorca crassidens</i>	False Killer Whale	IV	WA	NE
<i>Rattus rattus</i>	Black or Ship Rat			VU
<i>Rhinolophus hipposideros</i>	Lesser Horseshoe Bat	II IV	WA	LC
<i>Sciurus vulgaris</i>	Red Squirrel		WA	LC
<i>Sorex minutus</i>	Pygmy Shrew		WA	LC
<i>Stenella coeruleoalba</i>	Striped Dolphin	IV	WA	NE
<i>Tursiops truncatus</i>	Common Bottlenose Dolphin	II IV	WA	NE
<i>Ziphius cavirostris</i>	Cuvier's Beaked Whale	IV	WA	NE

4.2 Birds

All species of wild bird that occur naturally in Ireland are fully protected at all times by the Wildlife Act and relevant amending legislation.

This protection may be lessened by other legislation. Some bird species are listed on the Open Seasons Order. This is subject to amendment and the latest version can be found on the NPWS website at <https://www.npws.ie/legislation/irish-law/open-seasons-order>.

Similarly, all birds naturally occurring in the wild state are protected by the EU Birds Directive but derogations may reduce protection for specified reasons. Two derogations from protective measures can apply, one where birds are causing damage to crops, livestock, flora and fauna or represent a threat to public health and safety, and a second where birds represent a threat to air safety. As these are subject to annual review, the species covered are not listed here but the most recent version of these can be found on the NPWS website at <https://www.npws.ie/legislation/irish-law/eu-birds-directive-derogations>.

The checklist includes species which a) are Amber or Red on the most recent BoCCI (Colhoun & Cummins, 2013) and b) species which are on Annex I and which are reported in the Article 12 report. Some Annex I species that have been recorded in Ireland irregularly and as vagrants are, therefore, not included in this checklist. The BoCCI assessment is given for all species. The taxonomy and scientific

nomenclature used in this report follow that used for Article 12 reporting under the EU Bird's Directive. Common names follow normal usage in Ireland. The EU Bird List incorporates the taxonomic and nomenclatural changes proposed in del Hoyo & Collar (2014) and del Hoyo & Collar (2016).

Table 12 Checklist of Birds

Species name	Common name	EU BD	BoCCI
<i>Accipiter gentilis</i>	Goshawk		Amber
<i>Accipiter nisus</i>	Sparrowhawk		Amber
<i>Acrocephalus scirpaceus</i>	Reed Warbler		Amber
<i>Actitis hypoleucos</i>	Common Sandpiper		Amber
<i>Alauda arvensis</i>	Skylark		Amber
<i>Alca torda</i>	Razorbill		Amber
<i>Alcedo atthis</i>	Kingfisher	I	Amber
<i>Anas acuta</i>	Pintail		Red
<i>Anas crecca</i>	Teal		Amber
<i>Anser albifrons flavirostris</i>	Greenland White-fronted Goose	I	Amber
<i>Anser anser</i>	Greylag Goose		Amber
<i>Anthus pratensis</i>	Meadow Pipit		Red
<i>Apus apus</i>	Swift		Amber
<i>Aquila chrysaetos</i>	Golden Eagle	I	Red
<i>Ardenna grisea</i>	Sooty Shearwater		Red
<i>Asio flammeus</i>	Short-eared Owl	I	Amber
<i>Aythya ferina</i>	Pochard		Red
<i>Aythya fuligula</i>	Tufted Duck		Red
<i>Aythya marila</i>	Scaup		Amber
<i>Branta bernicla hrota</i>	Light-bellied Brent Goose		Amber
<i>Branta leucopsis</i>	Barnacle Goose	I	Amber
<i>Bucephala clangula</i>	Goldeneye		Red
<i>Calidris alpina alpina</i>	Dunlin		Red
<i>Calidris alpina schinzii</i>	Dunlin	I	Red
<i>Calidris canutus</i>	Knot		Amber
<i>Calidris pugnax (Philomachus pugnax)</i>	Ruff	I	Amber
<i>Calonectris borealis (Calonectris diomedea)</i>	Cory's Shearwater	I	Amber
<i>Caprimulgus europaeus</i>	Nightjar	I	Red
<i>Catharacta skua</i>	Great Skua		Amber
<i>Cephus grylle</i>	Black Guillemot		Amber
<i>Charadrius dubius</i>	Little Ringed Plover		Amber
<i>Chloris chloris</i>	Greenfinch		Amber
<i>Circus aeruginosus</i>	Marsh Harrier	I	Amber
<i>Circus cyaneus</i>	Hen Harrier	I	Amber
<i>Clangula hyemalis</i>	Long-tailed Duck		Red
<i>Columba oenas</i>	Stock Dove		Amber
<i>Coturnix coturnix</i>	Quail		Red

Species name	Common name	EU BD	BoCCI
<i>Crex crex</i>	Corncrake	I	Red
<i>Cygnus columbianus bewickii</i>	Bewick's Swan	I	Red
<i>Cygnus cygnus</i>	Whooper Swan	I	Amber
<i>Cygnus olor</i>	Mute Swan		Amber
<i>Delichon urbicum</i>	House Martin		Amber
<i>Dendrocopos major</i>	Great Spotted Woodpecker		Amber
<i>Egretta garzetta</i>	Little Egret	I	Green
<i>Emberiza citrinella</i>	Yellowhammer		Red
<i>Erithacus rubecula</i>	Robin		Amber
<i>Falco columbarius</i>	Merlin	I	Amber
<i>Falco peregrinus</i>	Peregrine	I	Green
<i>Falco tinnunculus</i>	Kestrel		Amber
<i>Ficedula hypoleuca</i>	Pied Flycatcher		Amber
<i>Fratercula arctica</i>	Puffin		Amber
<i>Gallinago gallinago</i>	Snipe		Amber
<i>Gavia arctica</i>	Black-throated Diver	I	Amber
<i>Gavia immer</i>	Great Northern Diver	I	Amber
<i>Gavia stellata</i>	Red-throated Diver	I	Amber
<i>Haematopus ostralegus</i>	Oystercatcher		Amber
<i>Haliaeetus albicilla</i>	White-tailed Eagle	I	Red
<i>Hirundo rustica</i>	Swallow		Amber
<i>Hydrobates leucorhous (Oceanodroma leucorhoa)</i>	Leach's Storm Petrel	I	Red
<i>Hydrobates pelagicus</i>	Storm Petrel	I	Amber
<i>Hydrocoloeus minutus (Larus minutus)</i>	Little Gull	I	Amber
<i>Lagopus lagopus</i>	Red Grouse		Red
<i>Larus argentatus</i>	Herring Gull		Red
<i>Larus canus</i>	Common Gull		Amber
<i>Larus fuscus</i>	Lesser Black-backed Gull		Amber
<i>Larus marinus</i>	Great Black-backed Gull		Amber
<i>Larus melanocephalus</i>	Mediterranean Gull	I	Amber
<i>Larus ridibundus</i>	Black-headed Gull		Red
<i>Limosa lapponica</i>	Bar-tailed Godwit	I	Amber
<i>Limosa limosa</i>	Black-tailed Godwit		Amber
<i>Linaria cannabina</i>	Linnet		Amber
<i>Linaria flavirostris</i>	Twite		Red
<i>Lymnocyptes minimus</i>	Jack Snipe		Amber
<i>Mareca penelope</i>	Wigeon		Red
<i>Mareca strepera</i>	Gadwall		Amber
<i>Melanitta fusca</i>	Velvet Scoter		Red
<i>Melanitta nigra</i>	Common Scoter		Red
<i>Mergellus albellus</i>	Smew	I	Amber
<i>Mergus merganser</i>	Goosander		Amber

Species name	Common name	EU BD	BoCCI
<i>Milvus milvus</i>	Red Kite	I	Amber
<i>Morus bassanus</i>	Gannet		Amber
<i>Motacilla cinerea</i>	Grey Wagtail		Red
<i>Motacilla flava</i>	Yellow Wagtail		Amber
<i>Muscicapa striata</i>	Spotted Flycatcher		Amber
<i>Numenius arquata</i>	Curlew		Red
<i>Oenanthe oenanthe</i>	Wheatear		Amber
<i>Passer domesticus</i>	House Sparrow		Amber
<i>Passer montanus</i>	Tree Sparrow		Amber
<i>Perdix perdix</i>	Grey Partridge		Red
<i>Phalacrocorax aristotelis</i>	Shag		Amber
<i>Phalacrocorax carbo</i>	Cormorant		Amber
<i>Phalaropus lobatus</i>	Red-necked Phalarope	I	Red
<i>Phoenicurus phoenicurus</i>	Common Redstart		Amber
<i>Phylloscopus sibilatrix</i>	Wood Warbler		Amber
<i>Pluvialis apricaria</i>	Golden Plover	I	Red
<i>Pluvialis squatarola</i>	Grey Plover		Amber
<i>Podiceps auritus</i>	Slavonian Grebe	I	Amber
<i>Podiceps cristatus</i>	Great Crested Grebe		Amber
<i>Podiceps nigricollis</i>	Black-necked Grebe		Red
<i>Porzana porzana</i>	Spotted Crake	I	Amber
<i>Puffinus mauretanicus</i>	Balearic Shearwater	I	Red
<i>Puffinus puffinus</i>	Manx Shearwater		Amber
<i>Pyrhhorax pyrrhhorax</i>	Chough	I	Amber
<i>Regulus regulus</i>	Goldcrest		Amber
<i>Riparia riparia</i>	Sand Martin		Amber
<i>Rissa tridactyla</i>	Kittiwake		Amber
<i>Saxicola rubetra</i>	Whinchat		Red
<i>Saxicola torquatus</i>	Stonechat		Amber
<i>Scolopax rusticola</i>	Woodcock		Red
<i>Somateria mollissima</i>	Eider		Amber
<i>Spatula clypeata</i>	Shoveler		Red
<i>Spatula querquedula</i>	Garganey		Amber
<i>Sterna dougallii</i>	Roseate Tern	I	Amber
<i>Sterna hirundo</i>	Common Tern	I	Amber
<i>Sterna paradisaea</i>	Arctic Tern	I	Amber
<i>Sternula albifrons</i>	Little Tern	I	Amber
<i>Streptopelia turtur</i>	Turtle Dove		Amber
<i>Sturnus vulgaris</i>	Starling		Amber
<i>Sylvia curruca</i>	Lesser Whitethroat		Amber
<i>Tachybaptus ruficollis</i>	Little Grebe		Amber
<i>Tadorna tadorna</i>	Shelduck		Amber

Species name	Common name	EU BD	BoCCI
<i>Thalasseus sandvicensis</i> (<i>Sterna sandvicensis</i>)	Sandwich Tern	I	Amber
<i>Tringa erythropus</i>	Spotted Redshank		Amber
<i>Tringa glareola</i>	Wood Sandpiper	I	Amber
<i>Tringa totanus</i>	Redshank		Red
<i>Turdus torquatus</i>	Ring Ouzel		Red
<i>Turdus viscivorus</i>	Mistle Thrush		Amber
<i>Tyto alba</i>	Barn Owl		Red
<i>Uria aalge</i>	Guillemot		Amber
<i>Vanellus vanellus</i>	Lapwing		Red

4.3 Reptiles

Nomenclature and the latest Red List assessment of the Irish marine and terrestrial reptiles are from King *et al.* (2011). The relevant national legislation is the Wildlife Act (1976), as amended. The Common Lizard was added to the Wildlife Act by regulations made in S.I. No. 282 of 1980, and marine turtles were added by S.I. No. 112 of 1990.

Table 13 Checklist of Reptiles

Species name	Common name	EU HD	WA	Red List Status
<i>Caretta caretta</i>	Loggerhead Turtle	II IV	WA	NA
<i>Dermochelys coriacea</i>	Leatherback Turtle	IV	WA	LC
<i>Eretmochelys imbricata</i>	Hawksbill Turtle	IV	WA	NA
<i>Lepidochelys kempii</i>	Kemp's Ridley Turtle	IV	WA	NA
<i>Zootoca vivipara</i> (<i>Lacerta vivipara</i>)	Common Lizard		WA	LC

4.4 Amphibians

Nomenclature and the latest Red List assessment of the Irish amphibians are from King *et al.* (2011). The relevant national legislation is the Wildlife Act (1976), as amended. The Common Frog and Common Newt were added to the Wildlife Act, 1976 by regulations made in S.I. No. 282 of 1980.

Table 14 Checklist of Amphibians

Species name	Common name	EU HD	WA	Red List Status
<i>Epidalea calamita</i> (<i>Bufo calamita</i>)	Natterjack Toad	IV	WA	EN
<i>Lissotriton vulgaris</i> (<i>Triturus vulgaris</i>)	Common Newt		WA	LC
<i>Rana temporaria</i>	Common Frog	V	WA	LC

4.5 Freshwater Fish

Nomenclature and the latest Red List assessment of the Irish freshwater fish are from King *et al.* (2011). The EU HD Annex provisions only refers to Atlantic Salmon *Salmo salar* in freshwater. Many freshwater fish species are listed on the Wildlife (Fish and Aquatic Invertebrate Animals) (Exclusion) Regulations, 2001 (S.I. No. 372 of 2001), which excludes them from the provisions of the Wildlife (Amendment) Act, 2000.

Table 15 Checklist of Freshwater Fish

Species name	Common name	EU HD		Red List Status
<i>Alosa alosa</i>	Allis Shad	II	V	DD
<i>Alosa fallax</i>	Twaite Shad	II	V	VU
<i>Alosa fallax killarnensis</i>	Killarney Shad	II	V	VU
<i>Anguilla anguilla</i>	European Eel			CR
<i>Coregonus autumnalis</i>	Pollan		V	VU
<i>Lampetra fluviatilis</i>	River Lamprey	II	V	LC
<i>Lampetra planeri</i>	Brook Lamprey	II		LC
<i>Petromyzon marinus</i>	Sea Lamprey	II		NT
<i>Salmo salar</i>	Atlantic Salmon	II	V	VU
<i>Salvelinus alpinus</i>	Arctic Charr			VU

4.6 Cartilaginous Fish (Sharks, Skates, Rays and Chimaeras)

Nomenclature and the latest Red List assessment of the Irish marine cartilaginous fish are from Clarke *et al.* (2016). Many marine cartilaginous fish are listed on the Wildlife (Fish and Aquatic Invertebrate Animals) (Exclusion) Regulations, 2001 (S.I. No. 372 of 2001), which excludes them from the provisions of the Wildlife (Amendment) Act, 2000.

Table 16 Checklist of Cartilaginous Fish (Sharks, Skates, Rays and Chimaeras)

Species name	Common name	Red List Status
<i>Apristurus manis</i>	Ghost Shark	NT
<i>Apristurus melanoasper</i>	Black Roughscale Catshark	NT
<i>Apristurus microps</i>	Smalleye Catshark	NT
<i>Centrophorus squamosus</i>	Leafscale Gulper Shark	EN
<i>Centroscymnus coelolepis</i>	Portuguese Dogfish	CR
<i>Centroselachus crepidater</i>	Longnose Velvet Dogfish	VU
<i>Cetorhinus maximus</i>	Basking Shark	EN
<i>Chimaera monstrosa</i>	Rabbitfish	NT
<i>Chimaera opalescens</i>	Opal Chimaera	NT
<i>Dalatias licha</i>	Kitefin Shark	VU
<i>Dasyatis pastinaca</i>	Common Stingray	EN
<i>Deania calcea</i>	Birdbeak Dogfish	NT

Species name	Common name	Red List Status
<i>Dipturus batis</i> (<i>Dipturus flossada</i>)	Common Skate	CR
<i>Dipturus intermedia</i>	Flapper Skate	CR
<i>Dipturus nidarosiensis</i>	Norwegian Skate	NT
<i>Dipturus oxyrinchus</i>	Longnosed Skate	VU
<i>Etmopterus princeps</i>	Greater Lantern shark	NT
<i>Galeorhinus galeus</i>	Tope	VU
<i>Hexanchus griseus</i>	Bluntnose Sixgill Shark	NT
<i>Hydrolagus mirabilis</i>	Large-eyed Rabbitfish	NT
<i>Lamna nasus</i>	Porbeagle	CR
<i>Leucoraja circularis</i>	Sandy Ray	NT
<i>Leucoraja fullonica</i>	Shagreen Ray	VU
<i>Leucoraja naevus</i>	Cuckoo Ray	VU
<i>Malacoraja krefftii</i>	Krefft's Ray	NT
<i>Neoraja caerulea</i>	Blue Ray	NT
<i>Oxynotus paradoxus</i>	Sharp-back Shark	NT
<i>Prionace glauca</i>	Blue Shark	NT
<i>Raja brachyura</i>	Blonde Ray	NT
<i>Raja undulata</i>	Undulate Skate	EN
<i>Rhinochimaera atlantica</i>	Straightnose Rabbitfish	NT
<i>Rostroraja alba</i>	White Skate	CR
<i>Scymnodon ringens</i>	Knifetooth Dogfish	NT
<i>Squalus acanthias</i>	Spurdog	EN
<i>Squatina squatina</i>	Angel Shark	CR
<i>Tetronarce nobiliana</i>	Electric Ray	NT

5 Insects

Insect checklists are provided in alphabetical order, by the group's common name.

5.1 Bees (Hymenoptera, Apoidea)

The latest Red List assessment of the Irish bees is FitzPatrick *et al.* (2006). Nomenclature, both scientific and common names, follows Falk & Lewington (2015). Species assessed as RE in FitzPatrick *et al.* (2006) for which native population/s have since been discovered are indicated as RE*.

Table 17 Checklist of Bees (Hymenoptera, Apoidea)

Species name	Common name	Red List Status
<i>Andrena angustior</i>	Groove-faced Mining Bee	VU
<i>Andrena barbilabris</i>	Sandpit Mining Bee	NT
<i>Andrena coitana</i>	Small Flecked Mining Bee	VU
<i>Andrena denticulata</i>	Grey-banded Mining Bee	VU
<i>Andrena fucata</i>	Painted Mining Bee	NT
<i>Andrena fulva</i>	Tawny Mining Bee	RE*
<i>Andrena fuscipes</i>	Heather Mining Bee	VU
<i>Andrena humilis</i>	Buff-tailed Mining Bee	CR
<i>Andrena marginata</i>	Small Scabious Mining Bee	CR
<i>Andrena nigroaenea</i>	Buffish Mining Bee	VU
<i>Andrena praecox</i>	Small Sallow Mining Bee	VU
<i>Andrena rosae</i>	Perkin's Mining Bee	RE
<i>Andrena semilaevis</i>	Shiny-margined Mini-miner	VU
<i>Andrena trimmerana</i>	Trimmer's Mining Bee	CR
<i>Bombus barbutellus</i>	Barbut's Cuckoo Bee	EN
<i>Bombus bohemicus</i>	Gypsy Cuckoo Bee	NT
<i>Bombus campestris</i>	Field Cuckoo Bee	VU
<i>Bombus distinguendus</i>	Large Yellow Bumblebee	EN
<i>Bombus lapidarius</i>	Red-tailed Bumblebee	NT
<i>Bombus muscorum</i>	Moss Carder Bee	NT
<i>Bombus ruderarius</i>	Red-shanked Bumblebee	VU
<i>Bombus rupestris</i>	Red-tailed Cuckoo Bee	EN
<i>Bombus sylvarum</i>	Shrill Carder Bee	EN
<i>Coelioxys elongata</i>	Dull-vented Sharp-tail Bee	EN
<i>Colletes floralis</i>	Northern Colletes	VU
<i>Colletes similis</i>	Bare-saddled Colletes	NT
<i>Halictus tumulorum</i>	Bronze Furrow Bee	NT
<i>Hylaeus brevicornis</i>	Short-horned Yellow-face Bee	EN
<i>Hylaeus hyalinatus</i>	Hairy Yellow-face Bee	VU
<i>Lasioglossum lativentre</i>	Furry-claspered Furrow Bee	CR

Species name	Common name	Red List Status
<i>Lasioglossum nitidiusculum</i>	Tufted Furrow Bee	VU
<i>Lasioglossum rufitarse</i>	Rufous-footed Furrow Bee	VU
<i>Megachile centuncularis</i>	Patchwork Leafcutter Bee	NT
<i>Megachile maritima</i>	Coast Leafcutter Bee	NT
<i>Megachile willughbiella</i>	Willoughy's Leafcutter Bee	NT
<i>Nomada argentata</i>	Silver-sided Nomad Bee	CR
<i>Nomada goodeniana</i>	Gooden's Nomad Bee	EN
<i>Nomada obtusifrons</i>	Flat-ridged Nomad Bee	EN
<i>Nomada panzeri</i>	Panzer's Nomad Bee	NT
<i>Nomada sheppardana</i>	Sheppard's Nomad Bee	RE
<i>Nomada striata</i>	Blunt-jawed Nomad Bee	EN
<i>Osmia aurulenta</i>	Gold-fringed Mason Bee	NT
<i>Sphecodes ferruginatus</i>	Dull-headed Blood Bee	EN
<i>Sphecodes gibbus</i>	Dark-winged Blood Bee	CR
<i>Sphecodes hyalinatus</i>	Furry-bellied Blood Bee	VU

5.2 Butterflies (Lepidoptera)

Nomenclature and the latest Red List assessment of the Irish butterflies are from Regan *et al.* (2010).

Table 18 Checklist of Butterflies (Lepidoptera)

Species name	Common name	EU HD	Red List Status
<i>Argynnis aglaja</i>	Dark Green Fritillary		VU
<i>Boloria euphrosyne</i>	Pearl-bordered Fritillary		EN
<i>Coenonympha pamphilus</i>	Small Heath		NT
<i>Coenonympha tullia</i>	Large Heath		VU
<i>Cupido minimus</i>	Small Blue		EN
<i>Erebia epiphron</i>	Mountain Ringlet		RE
<i>Erynnis tages</i>	Dingy Skipper		NT
<i>Euphydryas aurinia</i>	Marsh Fritillary	II	VU
<i>Hipparchia semele</i>	Grayling		NT
<i>Lasiommata megera</i>	Wall		EN
<i>Leptidea sinapis</i>	Wood White		NT
<i>Pyronia tithonus</i>	Gatekeeper		NT

5.3 Damselflies and Dragonflies (Odonata)

Nomenclature and the latest Red List assessment of the Irish Odonata are from Nelson *et al.* (2011).

Table 19 Checklist of Damselflies and Dragonflies (Odonata)

Species name	Common name	Red List Status
<i>Coenagrion lunulatum</i>	Irish Damselfly/Crescent Bluet	VU
<i>Cordulia aenea</i>	Downy Emerald	EN
<i>Ischnura pumilio</i>	Scarce Blue-tailed Damselfly/Small Bluetail	VU
<i>Lestes dryas</i>	Scarce Emerald Damselfly/Robust Spreadwing	NT
<i>Somatochlora arctica</i>	Northern Emerald	EN

5.4 Macro-moths (Lepidoptera)

Nomenclature and the latest Red List assessment of the Irish macro-moths are from Allen *et al.* (2016).

Table 20 Checklist of Macro-moths (Lepidoptera)

Species name	Common name	Red List Status
<i>Actebia praecox</i>	Portland Moth	CR
<i>Adscita statices</i>	Forester	EN
<i>Agrotis cinerea</i>	Light Feathered Rustic	CR
<i>Agrotis clavis</i>	Heart & Club	NT
<i>Alcis jubata</i>	Dotted Carpet	VU
<i>Amphipyra tragopoginis</i>	Mouse Moth	NT
<i>Apamea oblonga</i>	Crescent Striped	EN
<i>Apamea sublustris</i>	Reddish Light Arches	NT
<i>Aporophyla australis</i>	Feathered Brindle	VU
<i>Asteroscopus sphinx</i>	Sprawler	NT
<i>Brachylomia viminalis</i>	Minor Shoulder-knot	VU
<i>Calamia tridens</i>	Burren Green	NT
<i>Camptogramma bilineata</i>	Yellow Shell	NT
<i>Carsia sororiata</i>	Manchester Treble-bar	CR
<i>Catarhoe cuculata</i>	Royal Mantle	VU
<i>Clostera pigra</i>	Small Chocolate-tip	NT
<i>Coenocalpe lapidata</i>	Slender-striped Rufous	RE
<i>Colostygia olivata</i>	Beech-green Carpet	EN
<i>Cucullia absinthii</i>	Wormwood	RE
<i>Cucullia verbasci</i>	Mullein	RE
<i>Cyclophora punctaria</i>	Maiden's Blush	EN
<i>Dicallomera fascelina</i>	Dark Tussock	NT
<i>Diloba caeruleocephala</i>	Figure of Eight	NT

Species name	Common name	Red List Status
<i>Drymonia dodonaea</i>	Marbled Brown	VU
<i>Earias clorana</i>	Cream-bordered Green Pea	RE
<i>Eilema caniola</i>	Hoary Footman	NT
<i>Enargia paleacea</i>	Angle-striped Sallow	VU
<i>Ennomos erosaria</i>	September Thorn	RE
<i>Entephria caesiata</i>	Grey Mountain Carpet	NT
<i>Entephria flavicinctata</i>	Yellow-ringed Carpet	CR
<i>Epirrhoe tristata</i>	Small Argent & Sable	VU
<i>Epirrita filigrammaria</i>	Small Autumnal Moth	VU
<i>Eriogaster lanestris</i>	Small Eggar	NT
<i>Eupithecia denotata</i>	Jasione Pug	VU
<i>Eupithecia intricata</i>	Freyer's/Mere's Pug	VU
<i>Eupithecia pygmaeata</i>	Marsh Pug	VU
<i>Eupithecia simpliciatata</i>	Plain Pug	VU
<i>Eupithecia succenturiata</i>	Bordered Pug	VU
<i>Euxoa cursoria</i>	Coast Dart	NT
<i>Euxoa nigricans</i>	Garden Dart	NT
<i>Furcula bicuspis</i>	Alder Kitten	VU
<i>Globia sparganii</i>	Webb's Wainscot	VU
<i>Gnophos dumetata</i>	Irish Annulet	EN
<i>Hyppa rectilinea</i>	Saxon	VU
<i>Idaea muricata</i>	Purple-bordered Gold	EN
<i>Lacanobia suasa</i>	Dog's Tooth	NT
<i>Larentia clavaria</i>	Mallow	CR
<i>Lenisa geminipuncta</i>	Twin-spotted Wainscot	VU
<i>Leucodonta bicoloria</i>	White Prominent	EN
<i>Luperina nickerlii</i>	Sandhill Rustic	EN
<i>Lymantria monacha</i>	Black Arches	VU
<i>Macaria wauaria</i>	V-Moth	RE
<i>Miltochrista miniata</i>	Rosy Footman	VU
<i>Odezia atrata</i>	Chimney Sweeper	VU
<i>Orthosia miniosa</i>	Blossom Underwing	RE
<i>Orthosia opima</i>	Northern Drab	VU
<i>Orthosia populeti</i>	Lead-coloured Drab	VU
<i>Parasemia plantaginis</i>	Wood Tiger	NT
<i>Parastichtis suspecta</i>	Suspected	RE
<i>Pareulype berberata</i>	Barberry Carpet	RE
<i>Pechipogo strigilata</i>	Common Fan-foot	RE
<i>Perizoma flavofasciata</i>	Sandy Carpet	NT
<i>Perizoma minorata</i>	Heath Rivulet	VU
<i>Phytometra viridaria</i>	Small Purple-barred	NT
<i>Polia bombycina</i>	Pale Shining Brown	RE

Species name	Common name	Red List Status
<i>Polymixis xanthomista</i>	Black-banded	VU
<i>Pyropteron muscaeformis</i>	Thrift Clearwing	CR
<i>Rheumaptera hastata</i>	Argent & Sable	VU
<i>Rhyacia simulans</i>	Dotted Rustic	VU
<i>Scopula ternata</i>	Smoky Wave	VU
<i>Sesia apiformis</i>	Hornet Moth	RE
<i>Synanthedon scoliaeformis</i>	Welsh Clearwing	VU
<i>Tethea or</i>	Poplar Lutestring	NT
<i>Tholera decimalis</i>	Feathered Gothic	CR
<i>Triphosa dubitata</i>	Tissue	NT
<i>Xanthorhoe decoloraria</i>	Red Carpet	EN
<i>Xylena exsoleta</i>	Sword-grass	RE
<i>Zygaena lonicerae</i>	Narrow-bordered Five-spot Burnet	VU

5.5 Mayflies (Ephemeroptera)

Nomenclature and the latest Red List assessment of the Irish mayflies are from Kelly-Quinn & Regan (2012).

Table 21 Checklist of Mayflies (Ephemeroptera)

Species name	Common name	Red List Status
<i>Ameletus inopinatus</i>	Upland Summer Mayfly	NT
<i>Baetis atrebatinus</i>	Dark Olive	EN
<i>Ephemerella notata</i>	Yellow Hawk	EN
<i>Kageronia fuscogrisea</i>	Brown May Dun	NT
<i>Leptophlebia marginata</i>	Sepia Dun	VU
<i>Procloeon bifidum</i>	Pale Evening Dun	VU
<i>Rhithrogena germanica</i>	March Brown	VU
<i>Siphonurus armatus</i>	Scarce Summer	CR

5.6 Stoneflies (Plecoptera)

Nomenclature and the latest Red List assessment of the Irish stoneflies are from Feeley *et al.* (in press).

Table 22 Checklist of Stoneflies (Plecoptera)

Species name	Common name	Red List Status
<i>Capnia atra</i>		VU
<i>Perlodes mortoni</i>		RE
<i>Protonemura praecox</i>		EN

5.7 Water Beetles (Aquatic Coleoptera)

The latest Red List assessment of the water beetles is Foster *et al.* (2009). Scientific and common names are from Foster *et al.* (2009), other than *Ochthebius viridis fallaciosus*, which has since been elevated from sub-species to species (Villastrigo *et al.*, 2018) and a generic change of *Stictotarsus multilineatus* to *Boreonectes multilineatus*.

Table 23 Checklist of Water Beetles (Aquatic Coleoptera)

Species name	Common name	Red List Status
<i>Agabus arcticus</i>	Arctic Diver	NT
<i>Agabus congener</i>	Relative Diver	VU
<i>Agabus conspersus</i>	Spattered Diver	EN
<i>Agabus labiatus</i>	Lipped Diver	NT
<i>Bagous alismatis</i>	Water Plantain Sloth Weevil	CR
<i>Bagous brevis</i>	Short Sloth Weevil	CR
<i>Bagous frit</i>	A sloth weevil	VU
<i>Bagous glabrirostris</i>	Bald-beaked Sloth Weevil	RE
<i>Bagous limosus</i>	Mud Sloth Weevil	CR
<i>Bagous lutulentus</i>	Horsetail Sloth Weevil	CR
<i>Berosus luridus</i>	Sallow Scavenger Beetle	CR
<i>Berosus signaticollis</i>	Spotted Scavenger Beetle	EN
<i>Bidessus minutissimus</i>	Diminutive Diver	RE
<i>Boreonectes multilineatus</i> (<i>Stictotarsus multilineatus</i>)	Bubblegum Diver	NT
<i>Cyphon kongsbergensis</i>	Kongsberg Marsh Beetle	VU
<i>Cyphon punctipennis</i>	Transition Marsh Beetle	VU
<i>Donacia aquatica</i>	Zircon Reed Beetle	VU
<i>Donacia cinerea</i>	Hairy Reed Beetle	VU
<i>Donacia marginata</i>	A reed beetle	NT
<i>Donacia semicuprea</i>	Halfpenny Reed Beetle	RE
<i>Dryops similaris</i>	Turlough Long-Claw	NT
<i>Dytiscus circumcinctus</i>	Ring-eyed Great Diving Beetle	NT
<i>Dytiscus lapponicus</i>	Highland Great Diving Beetle	NT
<i>Enicocerus exsculptus</i>	Sculptured Moss Beetle	EN
<i>Enochrus halophilus</i>	Salty Scavenger Beetle	VU
<i>Enochrus melanocephalus</i>	Blackheaded Scavenger Beetle	NT
<i>Graptodytes bilineatus</i>	Two-lined Diver	NT
<i>Gyrinus distinctus</i>	Distinguished Whirligig	NT
<i>Gyrinus natator</i>	Shady Whirligig	NT
<i>Gyrinus urinator</i>	Artist Whirligig	NT
<i>Haliplus apicalis</i>	Saltmarsh Crawler Water Beetle	EN
<i>Haliplus lineolatus</i>	Hydravore Crawler Water Beetle	NT
<i>Haliplus variegatus</i>	Variegated Crawler Water Beetle	VU

Species name	Common name	Red List Status
<i>Helophorus alternans</i>	Ridge and Furrow	RE
<i>Helophorus arvernicus</i>	Upland Frenchman	EN
<i>Helophorus fulgidicollis</i>	Orangeman	VU
<i>Helophorus granularis</i>	Little Nobby	EN
<i>Helophorus nanus</i>	Dwarf	VU
<i>Helophorus strigifrons</i>	Wrinkled Brow	VU
<i>Hydraena minutissima</i>	Diminutive Moss Beetle	CR
<i>Hydraena nigrita</i>	Black Moss Beetle	VU
<i>Hydraena pulchella</i>	Beautiful Moss Beetle	RE
<i>Hydraena pygmaea</i>	Pygmy Moss Beetle	RE
<i>Hydraena rufipes</i>	Red-Legged Moss Beetle	EN
<i>Hydraena testacea</i>	Shelled Moss Beetle	VU
<i>Hydrochus angustatus</i>	Narrow Scavenger Beetle	RE
<i>Hydrochus brevis</i>	Bereft Scavenger Beetle	VU
<i>Hydrochus ignicollis</i>	Hotnecked Scavenger Beetle	NT
<i>Hydrocyphon deflexicollis</i>	Rockhopper Beetle	EN
<i>Hydroporus glabriusculus</i>	Three Bs Diver	EN
<i>Hydroporus longicornis</i>	Sharp's Parallel Diver	EN
<i>Hydroporus morio</i>	Quicksilver Diver	VU
<i>Hydroporus obsoletus</i>	Semisubterranean Diver	NT
<i>Hydroporus scalesianus</i>	Mr Scales's Diver	NT
<i>Hygrotus decoratus</i>	Decorous Diver	CR
<i>Hygrotus novemlineatus</i>	Nine-lined Diver	VU
<i>Hygrotus versicolor</i>	Rash Diver	VU
<i>Ilybius chalconatus</i>	Copper Diver	VU
<i>Ilybius subaeneus</i>	Dull Bronze Diver	VU
<i>Laccobius atratus</i>	Charred Scavenger Beetle	NT
<i>Laccophilus hyalinus</i>	Dinghy Skipper	VU
<i>Laccornis oblongus</i>	Dualist	NT
<i>Limnebius nitidus</i>	Bright Moss Beetle	EN
<i>Macrolea appendiculata</i>	Submerged Reed Beetle	NT
<i>Ochthebius auriculatus</i>	Eared Moss Beetle	NT
<i>Ochthebius bicolon</i>	Double Colon Moss Beetle	VU
<i>Ochthebius fallaciosus</i> (<i>Ochthebius viridis fallaciosus</i>)	Deceptive Moss Beetle	NT
<i>Ochthebius marinus</i>	Marine Moss Beetle	NT
<i>Ochthebius nilssoni</i>	Ciaróginbán	VU
<i>Oreodytes davisii</i>	Davis's River Diver	NT
<i>Paracymus scutellaris</i>	Shield Scavenger Beetle	NT
<i>Plateumaris bradata</i>	Breeched Water Beetle	CR
<i>Plateumaris rustica</i>	Peasant Reed Beetle	RE

6 Invertebrates (other than insects)

Checklists are currently provided for crayfish and non-marine Mollusca.

6.1 Crayfish (Astacoidea)

The relevant national legislation is the Wildlife Act (1976), as amended. White-clawed Crayfish *Austropotamobius pallipes* was added to the Wildlife Act, 1976 by regulations made in S.I. No. 112 of 1990. Nomenclature follows the Habitats Directive (Annex II).

Table 24 Checklist of Other invertebrates

Species name	Common name	EU HD	WA
<i>Austropotamobius pallipes</i>	White-clawed Crayfish	II V	WA

6.2 Non-marine Mollusca

The latest Red List assessment of the Irish non-marine Mollusca is Byrne *et al.* (2009). The relevant national legislation is the Wildlife Act (1976), as amended. Freshwater Pearl Mussel and Kerry Slug were added to the Wildlife Act, 1976 by regulations made in S.I. No. 112 of 1990. Nomenclature follows the Red List (Byrne *et al.*, 2009). Genetic research has since placed the Nore Pearl Mussel (*Margaritifera durrovensis*) within the *Margaritifera margaritifera* taxon (Feind *et al.*, 2016; Geist *et al.*, 2018).

Table 25 Checklist of Non-marine Mollusca

Species name	Common name	EU HD	WA	Red List Status
<i>Acanthinula aculeata</i>	Prickly Snail			NT
<i>Acicula fusca</i>	Point Snail			VU
<i>Anisus vortex</i>	Whirlpool Ram's Horn			VU
<i>Anodonta anatina</i>	Duck Mussel			VU
<i>Anodonta cygnea</i>	Swan Mussel			VU
<i>Aplexa hypnorum</i>	Moss Bladder Snail			VU
<i>Arianta arbustorum</i>	Copse Snail			VU
<i>Ashfordia granulata</i>	Silky Snail			NT
<i>Balea perversa</i>	Wall Snail			VU
<i>Cecilioides acicula</i>	Blind Snail			VU
<i>Cochlodina laminata</i>	Plaited Door Snail			VU
<i>Ecrobia ventrosa</i>	Spire Snail			VU
<i>Geomalacus maculosus</i>	Kerry Slug	II IV	WA	LC
<i>Gyraulus laevis</i>	Smooth Ramshorn			EN
<i>Helicella itala</i>	Heath Snail			VU
<i>Helicigona lapicida</i>	Lapidary Snail			RE
<i>Hydrobia acuta</i>				EN
<i>Leiostyla anglica</i>	English Chrysalis Snail			VU

Species name	Common name	EU HD	WA	Red List Status
<i>Limax cinereoniger</i>	Ash-black Slug			VU
<i>Margaritifera durrovensis</i> (<i>Margaritifera margaritifera</i> , <i>Margaritifera margaritifera</i> <i>durrovensis</i>)	Nore Pearl Mussel	II	V WA	CR
<i>Margaritifera margaritifera</i>	Freshwater Pearl Mussel	II	V WA	CR
<i>Mercuria cf. similis</i>	Swollen Spire Snail			EN
<i>Merdigera obscura</i>	Lesser Bullin			EN
<i>Musculium lacustre</i>	Lake Orb Mussel			VU
<i>Myxas glutinosa</i>	Glutinous Snail			EN
<i>Omphiscola glabra</i>	Mud Pond Snail			RE
<i>Pisidium conventus</i>	Arctic-alpine Pea Mussel			CR
<i>Pisidium hibernicum</i>	Globular Pea Mussel			NT
<i>Pisidium lilljeborgii</i>	Lilljeborg's Pea Mussel			VU
<i>Pisidium moitessierianum</i>	Pygmy Pea Mussel			EN
<i>Pisidium pseudosphaerium</i>	False Orb Pea Mussel			EN
<i>Pisidium pulchellum</i>	Iridescent Pea Mussel			EN
<i>Pomatias elegans</i>	Land Winkle			CR
<i>Pupilla muscorum</i>	Moss Chrysalis Snail			EN
<i>Quickella arenaria</i>	Sand Amber Snail			EN
<i>Radix auricularia</i>	Ear Pond Snail			VU
<i>Spermodea lamellata</i>	Plaited Snail			EN
<i>Sphaerium nucleus</i>				VU
<i>Succinella oblonga</i>	Small Amber Snail			EN
<i>Tandonia rustica</i>				VU
<i>Testacella haliotideia</i>	Shelled Slug			VU
<i>Testacella maugéi</i>	Maugé's Slug			NT
<i>Truncatella subcylindrica</i>	Looping Snail			CR
<i>Vallonia pulchella</i>	Smooth Grass Snail			VU
<i>Vertigo angustior</i>	Narrow-mouthed Whorl Snail	II		VU
<i>Vertigo antiwertigo</i>	Marsh Whorl Snail			VU
<i>Vertigo geyeri</i>	Geyer's Whorl Snail	II		VU
<i>Vertigo lilljeborgi</i>	Lilljeborg's Whorl Snail			VU
<i>Vertigo moulinsiana</i>	Des Moulin's Whorl Snail	II		EN
<i>Vertigo pusilla</i>	Wall Whorl Snail			EN
<i>Vertigo pygmaea</i>	Common Whorl Snail			NT
<i>Vertigo substriata</i>	Striated Whorl Snail			NT
<i>Zenobiella subrufescens</i>	Brown Snail			VU
<i>Zonitoides excavatus</i>	Hollowed Glass Snail			VU

7 Bibliography & Relevant Literature

- Allen, D., O'Donnell, M., Nelson, B., Tyner, A., Bond, K.G.M., Bryant, T., Crory, A., Mellon, C., O'Boyle, J., O'Donnell, E., Rolston, T., Sheppard, R., Strickland, P., FitzPatrick, U. & Regan, E. (2016) *Ireland Red List No. 9: Macro-moths (Lepidoptera)*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- Bryant, J.A. & Stewart, N.F. (2011) Order Charales. In: John, D.M., Whitton, B.A. & Brook, A.J. (Eds), *The Freshwater Algal Flora of the British Isles*. 2nd Edition. Cambridge University Press.
- Byrne, A., Moorkens, E.A., Anderson, R., Killeen, I.J. & Regan, E.C. (2009) *Ireland Red List No. 2: Non-marine Molluscs*. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
- Clarke, M., Farrell, E.D., Roche, W., Murray, T.E., Foster, S. & Marnell, F. (2016) *Ireland Red List No. 11: Cartilaginous fish [sharks, skates, rays and chimaerans]*. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs. Dublin, Ireland.
- Colhoun, K. & Cummins, S. (2013) Birds of Conservation Concern in Ireland 2014–2019. *Irish Birds* 9, 523–544.
- Curtis, T.G.F. & McGough, H.N. (1988) *The Irish Red Data Book 1: Vascular Plants*. Stationery Office, Dublin.
- del Hoyo, J. & Collar, N.J. (2014) *HBW and BirdLife International Illustrated Checklist of the Birds of the World. Volume 1: Non-passerines*. Lynx Edicions, Barcelona.
- del Hoyo, J. & Collar, N.J. (2016) *HBW and BirdLife International Illustrated Checklist of the Birds of the World. Volume 2: Passerines*. Lynx Edicions and BirdLife International, Barcelona, Spain and Cambridge, UK.
- Falk, S.J. & Lewington, R. (2015) *Field Guide to the Bees of Great Britain and Ireland*. British Wildlife Publications, Hook.
- Feeley, H.B., Baars, J.-R., Kelly-Quinn, M. & Nelson, B. (in press). *Ireland Red List No. 13: Stoneflies (Plecoptera)*. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Dublin, Ireland.
- Feind, S., Kuehn, R., Geist, J., Moorkens, E.A. & Killeen, I.J. (2016) *Population genetic analyses of the endangered freshwater pearl mussel (Margaritifera margaritifera) in Ireland*. Unpublished report for the National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.
- Ferriss, S.E., Smith, K.G. & Inskipp, T.P. (Eds) (2009) Irish Biodiversity: a taxonomic inventory of fauna. *Irish Wildlife Manuals*, No. 38. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
- FitzPatrick, Ú., Murray, T.E., Byrne, A., Paxton, R.J. & Brown, M.J.F. (2006) *Regional Red List of Irish Bees*. Report to National Parks & Wildlife Service (Ireland) and Environment & Heritage Service (N. Ireland).
- FitzPatrick, Ú., Regan, E. & Lysaght, L. (Eds) (2010) *Ireland's Biodiversity in 2010: State of Knowledge*. National Biodiversity Data Centre, Waterford.
- Foster, G.N., Nelson, B.H. & O'Connor, Á. (2009) *Ireland Red List No. 1: Water beetles*. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
- Geist, J., Moorkens, E., Killeen, I., Feind, S., Stoeckle, B.C., O'Connor, Á. & Kuehn, R. (2018) Genetic structure of Irish freshwater pearl mussels (*Margaritifera margaritifera* and *Margaritifera durrovensis*): validity of subspecies, roles of host fish, and conservation implications. *Aquatic Conservation: Marine and Freshwater Ecosystems* 28, 923–933.
- IUCN (2012) *Guidelines for Application of IUCN Red List Criteria at Regional and National Levels: Version 4.0*. IUCN Gland, Switzerland and Cambridge, UK.
- IUCN (2019) *Guidelines for Using the IUCN Red List Categories and Criteria. Version 14*. Prepared by the Standards and Petitions Committee.
- Jepp, M. (2019) *Irish Vascular Plant Synonym Workbook*. Version: 02.05.2019. National Botanic Gardens, Glasnevin. Available at <http://botanicgardens.ie/wp-content/uploads/2019/05/2-syno.xls> (accessed 30.10.2019).
- Kelly-Quinn, M. & Regan, E.C. (2012) *Ireland Red List No. 7: Mayflies (Ephemeroptera)*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- King, J., Marnell, F., Kingston, N., Rosell, R., Roche, W.K. & Cassidy, D. (2011) *Ireland Red List No. 5: Fish, Amphibians & Reptiles*. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.
- Lockhart, N., Hodgetts, N. & Holyoak, D. (2012) *Ireland Red List No.8: Bryophytes*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- Marnell, F., Kingston, N. & Looney, D. (2009) *Ireland Red List No. 3: Terrestrial Mammals*. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
- Marnell, F., Looney, D. & Lawton, C. (2019) *Ireland Red List No. 12: Terrestrial Mammals*. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.
- Nelson, B., Ronayne, C. & Thompson, R. (2011) *Ireland Red List No. 6: Damselflies & Dragonflies (Odonata)*. National Parks and Wildlife Service, Department of

- the Environment, Heritage and Local Government, Dublin, Ireland.
- Regan, E.C., Nelson, B., Aldwell, B., Bertrand, C., Bond, K., Harding, J., Nash, D., Nixon, D. & Wilson, C.J. (2010) *Ireland Red List No 4: Butterflies*. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Ireland
- Scannell, M.J.P. & Synnott, D.M. (1987) *Census Catalogue of the Flora of Ireland*. Second edition. Stationery Office, Dublin.
- Sell, P. & Murrell, G. (2006) *Flora of Great Britain and Ireland*. Volume 4. Campanulaceae – Asteraceae. Cambridge University Press, Cambridge.
- Smith, C.W., Aptroot, A., Coppins, B.J., Fletcher, A., Gilbert, O.L., James, P.W. & Wolsley, P.A. (Eds) (2009) *The Lichens of Great Britain and Ireland*. The British Lichen Society, London.
- Stace, C.A. (2019) *New Flora of the British Isles*. Fourth edition. C&M Floristics, Middlewood Green.
- Stewart, N.F. & Church, J.M. (1992) *Red Data Books of Britain & Ireland: Stoneworts*. JNCC, Peterborough.
- Villastrigo, A., Jäch, M.A., Cardoso, A., Valladares, L.F. & Ribera, I. (2018) A molecular phylogeny of the tribe Ochthebiini (Coleoptera, Hydraenidae, Ochthebiinae). *Systematic Entomology* doi: 10.1111/syen.12318.
- Wilde, A. (1993) *Threatened Mammals, Birds, Amphibians and Fish in Ireland*. Irish Red Data book 2: Vertebrates. Belfast, HMSO.
- Wilson, D.E. & Reeder, D.M. (editors) (2005) *Mammal Species of the World. A Taxonomic and Geographic Reference (3rd edition)*. Johns Hopkins University Press.
- Wyse Jackson, M., FitzPatrick, Ú., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M. & Wright, M. (2016) *Ireland Red List No. 10: Vascular Plants*. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.

