

Ireland

Red List No. 12



THE IUCN RED LIST  
OF THREATENED SPECIES™

## Terrestrial Mammals







## Ireland Red List No. 12:

### Terrestrial Mammals

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## **Executive Summary**

- A new Red List of Irish terrestrial mammals is presented. This updates and supersedes the Red List published in 2009.
- All 27 terrestrial species native to Ireland or naturalised in Ireland before 1500 are assessed. The seals are included for the first time.
- Of these, one was found to be regionally extinct (grey wolf *Canis lupus*), one achieved a threat status of Vulnerable (black rat *Rattus rattus*), and the remaining 25 were assessed as least concern.
- Improvements in the status of the red squirrel, Leisler's bat and the otter were noted. Brandt's bat, previously considered data deficient and now considered a vagrant, has been removed from the list.
- While the Irish mammalian fauna in general is in good status a number of widespread threats are highlighted. In addition, the absence of reliable population data for many species is a concern. There are also concerns about the underlying status of many of the natural habitats on which Irish mammal species rely.
- Current and future research priorities are examined.

## **Acknowledgements**

With thanks to Deirdre Lynn for provision of Figure 3.

## Introduction

Mammals are particularly important for nature conservation, as they are generally charismatic flagship species whose welfare garners the support and sympathy of the general public. As umbrella species, with comparatively large home ranges, protecting enough habitat for their populations, will also protect adequate habitat for many other species (Hunter, 1995).

Ireland is comparatively poor in terms of mammal diversity, as it became isolated from mainland Europe relatively soon after the ice retreated following the last period of glaciation. As a result few mammals were able to cross the land-bridges between mainland Europe, Britain and Ireland before the island of Ireland reformed. Of the 219 terrestrial mammals found in Europe (Temple & Terry, 2007), only 27 or 12.3% are native or long established in Ireland, compared with 43 species found on the island of Britain (NHM, 2009).

Ireland has a long history of mammal recording, with an intense period of recording just prior to the publication of the An Foras Forbatha Atlases (Ní Lamhna, 1979; 1983). Subsequent mammal recording comes largely from single species surveillance or monitoring programmes that necessarily focus on species of conservation concern. Of particular note are several large scale studies of the badger (Smal, 1995; Feore, 1994), the otter (Chapman & Chapman, 1982; Lunnion & Reynolds, 1991; Preston *et al.*, 2004; Bailey & Rochford, 2006; Reid *et al.*, 2013), the hare (Reid *et al.* 2009; McGowan *et al.*, 2019) and the squirrels (Carey *et al.*, 2007; Lawton *et al.*, 2015). More recent collaborative works to map the ranges of several species have been published on bats (Roche *et al.*, 2014) and mammals in general (Lysaght & Marnell, 2016).

We can learn much about the ecology and biology of Irish mammal species from studies conducted elsewhere in Europe, but there are important differences too. The paucity of species here, and the consequent absence of con-generic or inter-generic competition in many cases, has allowed some mammals to exploit expanded niches in Ireland. For example, in Ireland, in the absence of the brown hare, the Irish hare (*Lepus timidus hibernicus*) is common in lowlands. Elsewhere in Europe, where the brown hare dominates the lowlands, *Lepus timidus* is an upland specialist. The Leisler's bat (*Nyctalus leisleri*) provides another example; in Ireland this is our only large bat species and it is widespread and abundant. In most other countries where Leisler's bat occurs it overlaps with at least one other large bat species (e.g. Noctule *Nyctalus noctula*) and is far less common.

Ireland's Atlantic climate and the fact that many mammals are at the north-western limit of their biogeographical range in Ireland has also led to some interesting ecological adaptations here. The probability of finding bats foraging on mild evenings in mid-winter, when their continental colleagues are hibernating deep in snow-drifted caves is one example.

These local differences displayed by Irish mammal species, supported in some cases by genetic and archaeological work, has led to a reappraisal of the historic and even taxonomic status of some Irish species (e.g. Finnegan *et al.*, 2007; Martinkova *et al.*, 2007; McDevitt *et al.*, 2009a).

Significant advances have been made in our understanding of Irish mammals since the first Red Data Book was published (Whilde, 1993). Indeed that publication provided the impetus and focus for an increase in mammal research here, as it identified significant gaps in our knowledge of



species ecology and status. Dedicated teams of mammal researchers are now present in most Irish universities and with the continuing development of both field and laboratory techniques and equipment, our understanding of Irish mammals is being advanced on many fronts. A new emphasis in recent years has been on long-term monitoring programmes (e.g. Aughney *et al.*, 2018, Lawton *et al.*, 2015). This has been largely driven by the demands of the EU Habitats Directive [92/43/EEC], but the results will provide robust trend data for many of our mammal species which in turn will underpin future conservation priorities and initiatives.

While university-led research has produced many scientific publications on Irish mammals over the last 10 years, public interest has also been stimulated and detailed and popular accounts of Irish mammals can be found in Hayden and Harrington (2000), Fairley (2001), Browne (2005) and Lysaght and Marnell (2016).

### **Aim**

The Ireland Red List of Terrestrial Mammals aims to:

- provide a full and objective assessment of species using the International Union for the Conservation of Nature (IUCN) categories and criteria (IUCN, 2001) in conjunction with their guidance on regional assessments (IUCN, 2003).
- allow for direct comparisons with the European (Temple & Terry, 2007) and global (IUCN, 2019) mammal assessments.
- update the assessment of terrestrial mammals carried out by Marnell *et al.*, 2009.
- provide a current and easily updatable list.
- identify those species most in need of conservation interventions.
- identify the major threats to Ireland's terrestrial mammals so that mitigating measures can be implemented.
- highlight areas of mammal ecology in Ireland requiring further research.

### **Red list categories & criteria**

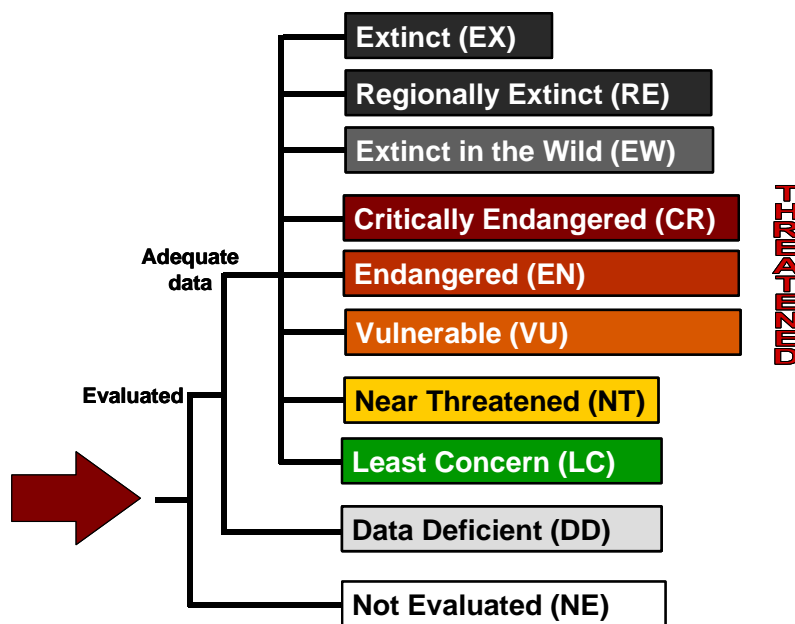
The IUCN Red List categories and criteria are intended to be an easily and widely understood system for classifying species at high risk of global extinction. The general aim of the system is to provide an explicit, objective framework for the classification of the broadest range of species according to their extinction risk (IUCN, 2001).

Various versions of the IUCN system have been in use for over 40 years (IUCN 1990), but since the late 1990s the categories and criteria have undergone an extensive review to produce a clearer, widely applicable, open and easy-to-use system. The IUCN also produce and regularly update detailed guidance on how to apply the categories and criteria (IUCN, 2019). Adoption of the IUCN system ensures consistency and comparability across taxonomic groups and regions.

In addition, the IUCN have provided guidance on how to apply the red list categories and criteria on a regional level (IUCN, 2003). Assessments for a geographically defined sub-global area, assist in conservation prioritisation at a regional level.

For the purposes of this assessment the additional category of “regionally extinct” was included, as recommended by the IUCN regional guidelines (IUCN, 2003). This category was not used in the 1993 assessment (Whilde, 1993). The “data deficient” category used in this assessment is equivalent to the indeterminate (I) category used in the 1993 assessment. The full list of categories used in this assessment is provided in figure 1.

Appendix 1, taken from IUCN 2008, provides a summary of the five criteria (A-E) used to evaluate whether a taxon belongs in a threatened category (Critically Endangered, Endangered or Vulnerable). In order to complete the current red list, each species was evaluated against each criterion A-D systematically. Criterion E was not used, as sufficient data for a fully quantitative assessment was not available for any of the terrestrial mammals. Where a species met any one of the criteria it was noted, and the highest level of threat achieved by a species became its qualifying category. All of the criteria met at the highest level of threat were listed for each species.



**Figure 1** – Red List categories used for the purposes of this assessment. Further details and definitions for these categories and the criteria for achieving them are available in IUCN (2001, 2003) and Appendix 1.

## Workshops

The assessments for all species were carried out on the 6<sup>th</sup> February 2019 by Dr Declan Looney (Northern Ireland Environment Agency [NIEA]), Dr Ferdia Marnell (National Parks & Wildlife Service [NPWS]) and Dr Colin Lawton (National University of Ireland, Galway [NUIG]).

More recent information on distribution and ecology has been included in the species accounts where available.

Complete reassessment of this list is recommended in 2029.

### Taxonomic and geographic scope

As with the 2009 Red List (Marnell *et al.*, 2009) all terrestrial species native to Ireland or naturalised in Ireland before 1500 were included in the assessment. In addition, for this assessment, the grey seal (*Halichoerus grypus*) and harbour seal (*Phoca vitulina*) which are resident in Ireland and spend much of their time on land, were also included (Table 1).

The geographic scope of this assessment, as with other Irish Red Lists (e.g. King *et al.*, 2011; Nelson *et al.*, 2011; Wyse Jackson *et al.*, 2016; Allen *et al.*, 2016), covers the whole island of Ireland. The taxonomy follows Wilson & Reeder (2005), apart from where Order names have been revised (O. Eulipotyphla, and O. Cetartiodactyla, Waddell *et al.*, 1999).

No species have been added to the native Irish mammal list since the 2009 assessment, but one has been dropped. The Brandt's bat (*Myotis brandtii*), a cryptic species which was first reported from Ireland in 2003 (Mullen, 2006), was assessed in 2009 as data deficient. Since then an extensive programme of surveys concluded that this species was not resident in Ireland (Boston *et al.* 2010). The species is now considered to be a vagrant and has not been considered further in this assessment. Another bat species has also appeared in Ireland since the 2009 assessment – the greater horseshoe bat (*Rhinolophus ferrumequinum*). Only a single specimen of this species has been reported and hence this species is also considered to be a vagrant (Roche *et al.*, 2014). It has not been evaluated.

**Table 1** – Terrestrial mammal species included in this red list assessment, listed according to their status.

<b>Regionally extinct</b>			
<i>Canis lupus</i>	Grey wolf		
<b>Vulnerable</b>			
<i>Rattus rattus</i>	Black rat/Ship rat		
<b>Least concern</b>			
<i>Erinaceus europaeus</i>	Hedgehog	<i>Sciurus vulgaris</i>	Red squirrel
<i>Sorex minutus</i>	Pygmy shrew	<i>Lutra lutra</i>	Otter
<i>Myotis daubentonii</i>	Daubenton's bat	<i>Martes martes</i>	Pine marten
<i>Myotis mystacinus</i>	Whiskered bat	<i>Meles meles</i>	Badger
<i>Myotis nattereri</i>	Natterer's bat	<i>Mustela erminea hibernica</i>	Irish stoat
<i>Nyctalus leisleri</i>	Leisler's bat	<i>Vulpes vulpes</i>	Red fox
<i>Pipistrellus nathusii</i>	Nathusius' pipistrelle	<i>Phoca vitulina</i>	Harbour seal
<i>Pipistrellus pipistrellus</i>	Common pipistrelle	<i>Halichoerus grypus</i>	Grey seal
<i>Pipistrellus pygmaeus</i>	Soprano pipistrelle	<i>Lepus timidus hibernicus</i>	Irish hare
<i>Plecotus auritus</i>	Brown long-eared bat	<i>Oryctolagus cuniculus</i>	Rabbit
<i>Rhinolophus hipposideros</i>	Lesser horseshoe bat	<i>Cervus elaphus</i>	Red deer
<i>Apodemus sylvaticus</i>	Wood mouse	<i>Dama dama</i>	Fallow deer
<i>Mus musculus domesticus</i>	House mouse		

Nine species were excluded from the 2009 assessment on the basis that they were post 1500 introductions. Two more introduced species have been confirmed as breeding in Ireland since

then: hazel dormouse (*Muscardinus avellanarius*) (Marnell *et al.*, 2013) and coypu (*Myocastor coypus*) (Marnell *et al.*, 2019) (Table 2). Species which are known only from the fossil record, or that became extinct before 1500, such as the giant Irish deer or brown bear (Mitchell, 1976; N. Monaghan pers. comm.), have not been included. Brandt’s bat, previously assessed as data deficient, is now considered a vagrant and is also not included in the assessments.

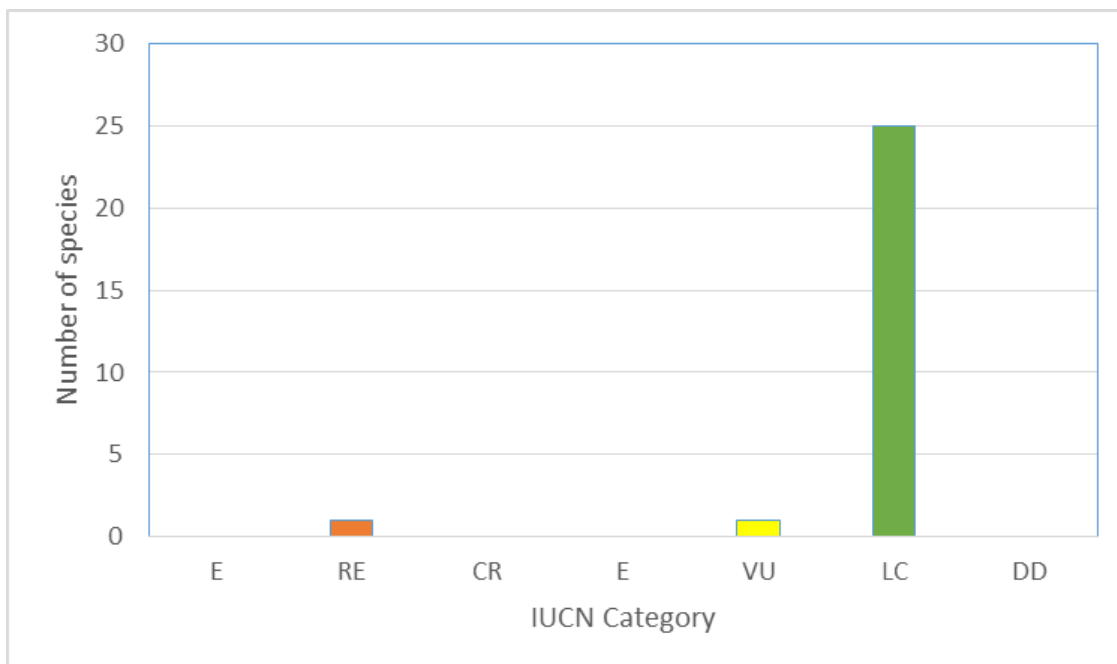
The feral goat (*Capra hircus*) and feral ferret (*Mustela putorius furo*) have been excluded as they are known to be descended from domestic animals. Finally, except for the two seal species, marine mammals have not been included.

**Table 2** – Terrestrial mammal species present in Ireland, but not included in this red list assessment on the basis that they are post-1500 introductions.

<i>Cervus nippon</i>	Sika deer	<i>Neovison vison</i>	American mink
<i>Crocidura russula</i>	Greater white-toothed shrew	<i>Rattus norvegicus</i>	Brown rat
<i>Lepus europaeus</i>	Brown hare	<i>Sciurus carolinesis</i>	Grey squirrel
<i>Myodes glareolus</i>	Bank vole	<i>Sus scrofa</i>	Wild boar
<i>Muntiacus reevesi</i>	Muntjac deer	<i>Muscardinus avellanarius</i>	Hazel dormouse
<i>Myocastor coypus</i>	Coypu		

### Summary of findings

Of the 27 species assessed, one was found to be Regionally Extinct (grey wolf *Canis lupus*), one achieved a threat status of Vulnerable (black rat *Rattus rattus*), and the rest were of Least Concern (Table 1; Figure 2).



**Figure 2** – The number of species in each of the IUCN categories in this assessment.

The 'Near Threatened' category provides us with a 'watch' list of species that may need to be upgraded to a threat category should their rate of decline increase. Three species were listed in the 2009 report as Near Threatened, Leisler's bat (*Nyctalus leisleri*), otter (*Lutra lutra*) and red squirrel (*Sciurus vulgaris*). All three have been revised to Least Concern in the current report due to population recovery. However, the status of all three, in particular the internationally important Leisler's bat and otter, should be carefully monitored in case the recoveries are not sustained. The otter is listed as Near Threatened at European and Global level ([www.iucnredlist.org](http://www.iucnredlist.org)), so the Irish population remains of importance.

A comparison between the previous reports and the current list shows other species retain the same status. The only threatened species is still the black rat, primarily because of its small range at only a single locality. This species is considered a pest species in many situations, has been assessed as Least Concern both globally and in the European Union (EU), and is not considered a priority for conservation action.

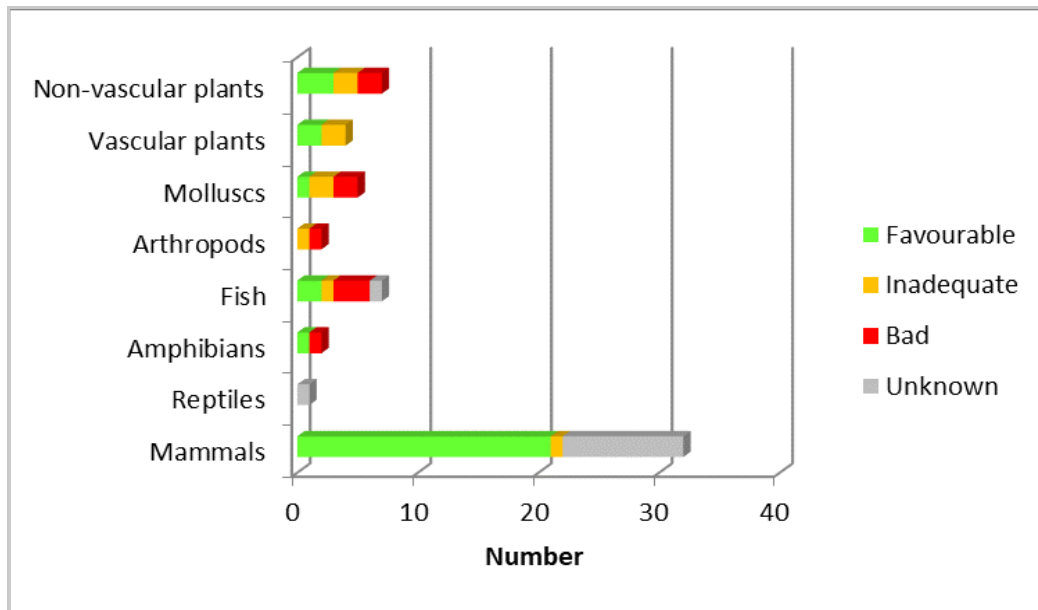
In 2009, Brandt's bat (*Myotis brandtii*) was considered Data Deficient, having been recorded on just one occasion. It was intended that the species would be fully assessed for this revision of the Red List. However, there have been no further confirmed records of the animal despite extensive survey work (see Boston *et al.*, 2010), and so this previous record is now considered to be that of a vagrant, and Brandt's bat has been removed from the list altogether.

Most terrestrial mammals enjoy some level of legal protection in Ireland, with 13 listed on the EU Habitats Directive, 22 on national legislation in the Republic of Ireland, and 18 on national legislation in Northern Ireland.

It is notable that the black rat, theoretically Ireland's rarest terrestrial mammal is not protected either at a national or EU level. Similarly the rabbit (*Oryctolagus cuniculus*), although it is considered Near Threatened at a European level, benefits from no legal protection under wildlife legislation in Ireland. Like all mammals, there is relevant protection under animal welfare legislation. Appendix 2 includes a list of the species covered by this assessment, with their current and previous status in Ireland, together with their EU and global status.

### **Implications for the conservation of Irish mammals**

With only one of our 26 extant native mammal species assessed as Vulnerable, and the rest listed as Least Concern, the overall impression is that Ireland's mammal fauna is in good status. Similar conclusions can be drawn from the recent report on species protected in the Republic of Ireland under the EU Habitats Directive, where almost 60% of mammals were deemed to be in favourable conservation status and none were found to be in bad status (figure 3; NPWS, 2019). The picture is not so favourable for natural habitats, however, with the majority of those listed on the Habitats Directive considered to be in poor or bad condition (NPWS 2019). While several mammal species have adapted well to managed landscapes, the underlying condition of our natural habitats is a growing concern.



**Figure 3** – The numbers of EU listed species in the Republic of Ireland categorised as Favourable (green), Inadequate (yellow), Bad (red) and unknown (grey) in 2019 (NPWS, 2019).

### Threats

A number of threats are repeatedly cited in the species accounts below. Not surprisingly many of these relate to habitat management issues. Woodland management is an important factor for many mammals (e.g. bats, red squirrel, pine marten). The spread of forestry in recent decades, albeit predominantly of conifers, has been of some benefit for these species. However, careful planning, particularly at clear-felling, is essential if these habitats are to continue to support healthy populations. New biodiversity guidelines from the Republic’s Forest Service are addressing some of these issues. Continued consultation between local wildlife officers and woodland managers will also be critical.

Water quality is another important underlying issue. While there is evidence that extreme pollution events, and the consequential fish kills they cause, are in decline (CFB, unpublished data), there is still some way to go if our rivers and lakes are to meet the requirements of the Water Framework Directive (Tierney & O’Boyle, 2018).

Recent reports of significant invertebrate biodiversity losses (Eisenhauer *et al.*, 2019) could impact on several mammal species directly, or indirectly through a cascade effect. The impacts of climate change on habitat, food sources and individual species are also a major concern now and in the future.

Significant numbers of mammals are killed on Irish roads every year. For widespread and common species road-kill is unlikely to play an important role in population control. However, for other species (e.g. otter, pine marten, red squirrel and lesser horseshoe bat) which are reliant on commuting corridors for dispersal and migration, road deaths may play a critical part in determining local population status. Newer national routes tend to have dedicated mammal underpasses and fencing and where these are well designed and maintained subsequent road-kill

can be avoided. Retro-fitting mammal mitigation into older roads is more difficult, although some success is possible for bats and squirrels with high level ropes and baffles.

Some mammals, despite legal protection, continue to suffer from various forms of persecution. The mustelids in particular, and the bats to a lesser extent, are targeted. Badger baiting still occurs in Ireland and interference with setts is not uncommon. Stoat and pine marten are seen as a threat to game birds and are illegally trapped and shot. Further efforts will be required by the statutory authorities in both jurisdictions to combat these illegal activities. These issues were highlighted in the 2009 report, and some actions, such as the production of leaflets and a website informing stakeholders of non-lethal methods of preventing pine martens from attacking game birds or nesting in roof spaces, have been made available ([www.pinemarten.ie](http://www.pinemarten.ie)). A combination of enhanced education and enforcement are required. The tendency of some bat species to roost in attics can bring them into conflict with humans. However, much of this conflict arises from misinformation and the education work of BCI and the Northern Ireland Bat Group together with the NIEA and the NPWS is helping address this (e.g. [www.npws.ie/en/WildlifePlanningtheLaw/Batsinhouses/](http://www.npws.ie/en/WildlifePlanningtheLaw/Batsinhouses/)).

#### *Conservation actions*

To a large extent, but not exclusively, conservation activities over the last decade have been focused on the mammal species listed in the EU Habitats Directive. Detailed distributional and habitat surveys in both Northern Ireland and the Republic of Ireland have been completed for otter, hare, pine marten, squirrels, deer and many bat species. Many smaller scale studies are also underway across the island, including work on small mammals, hedgehogs and deer. Publication of the findings of all these studies will further advance our knowledge of the Irish mammal fauna. It is also worth mentioning that ongoing bird research is also advancing our knowledge of Irish mammals, the 2008 discovery of the greater white-toothed shrew (*Crocidura russula*) being a case in point (Tosh, 2008).

In some cases surveys have been repeated and robust monitoring programmes are in place. For example, Ireland's Bat Monitoring Programme includes four separate annual schemes which together collect robust data for six of our nine bat species (Aughney *et al.*, 2018). Two of the schemes are run on an all-island basis with funding from NPWS and NIEA, while Waterways Ireland, a cross-border body, also supports one of the schemes. The Centre for Irish Bat Research (CIBR), a joint initiative between University College Dublin and Queen's University Belfast, funded by NPWS, provides another example of the potential benefits of actively sharing knowledge and experience between the two jurisdictions. The most recent 2019 squirrel and pine marten survey, similarly was completed on an all-island basis by research teams from NUI Galway, the Vincent Wildlife Trust and Ulster Wildlife. Further opportunities for cross-border cooperation on mammal survey and monitoring need to be explored.

All-Ireland Species Action Plans (SAPs) have been prepared for a number of mammal species, namely red squirrel, Irish hare and vesper bats (see [www.npws.ie/en/PublicationsLiterature](http://www.npws.ie/en/PublicationsLiterature)). Implementation of these plans to date, however, has been haphazard. NPWS have developed a more expansive form of plan, known as a Threat Response Plan (TRPs), for certain species in response to a European Court of Justice judgement against Ireland. These plans (for otter and

vesper bats) are also published on [www.npws.ie/en/PublicationsLiterature](http://www.npws.ie/en/PublicationsLiterature). They provide detailed information on the distribution, habitat and populations of the species concerned before examining the major threats they face and identifying the actions required to manage these threats. The TRPs have helped guide management and research but are now in need of updating.

#### *Current and future research priorities*

Most Irish universities now have active teams of mammal researchers. Much has been learned about the distribution, habitat preferences, diet, breeding biology and molecular ecology of many of our species. Inevitably some species have received more attention than others. The Irish hare has done particularly well, but concerns about potential hybridization and the impacts of coursing are likely to continue to generate interest in the species. The red squirrel has also been well served, but further work on its interaction with the invasive grey squirrel (*Sciurus carolinensis*) is required, as the status and range of both species is continuously changing. There has also been a steady interest in Irish bats, although the lesser horseshoe (*Rhinolophus hipposideros*) and Leisler's (*Nyctalus leisleri*) have probably received more than their fair share. The work undertaken in the Centre for Irish Bat Research has answered some outstanding questions about our rarer *Myotis* species, (see Boston *et al.*, 2010; Lundy *et al.*, 2012; Buckley *et al.*, 2013), but many questions remain.

Notwithstanding some research on badger diet (Cleary *et al.*, 2009) and the original field surveys by Smal (1995) and Feore (1994), most of the studies on the badger to date have focused on its role in bovine TB. However, the opportunity to study the ecology of badgers alongside the continuing bovine TB research has recently increased our understanding of this charismatic species (e.g. Mullen *et al.*, 2013).

The decline of the otter has been charted by large scale national surveys. The most recent report (Reid *et al.* 2013) suggests the species is in recovery after a previous decline. Continuing to monitor this species will require cross-sectoral collaboration between the bodies responsible for nature conservation, fisheries management and water quality in both jurisdictions. Meanwhile, the pine marten is expanding its range, and is having an adverse impact on invasive grey squirrels (Sheehy & Lawton, 2014). This has encouraged further investigations into this species' habits in Ireland.

The hedgehog (*Erinaceus europaeus*) and the stoat (*Mustela erminea hibernica*) would appear to have been underrepresented in Irish mammal research to date and more research on the ecology and conservation status of these species would be valuable.

Further research on the impact and control of invasive alien mammals is also required, including investigations of how to manage the less obvious interactions, such as the hybridising potential of brown hare on Irish hare and of sika deer on red deer. The impact of invasive mammals on native habitats is another area requiring study e.g. the destructive browsing effect of the recently introduced muntjac deer on forestry plantations and on ground flora. Bird populations may also be effected. The threat posed by American mink to ground nesting birds has been widely reported and discussions are now required on how best to manage this species in Ireland following the review by Roy *et al.*, (2009). The barn owl may be impacted from the recent accidental introduction of the greater white-toothed shrew to the south midlands, as the shrew is not providing the



necessary nutrition to the bird. It may also be contributing to the loss of pygmy shrew through competition (Montgomery *et al.*, 2012). Further research on these interactions are needed.

And finally, one of the most significant priorities for mammal research in the coming years relates to the potential impacts of climate change. Studies that help elucidate and anticipate how this global phenomenon will affect the distribution, habitat use and feeding ecology of Irish mammals will be required, to underpin future conservation management strategies.

## Format of Species Accounts

The species accounts for the Red List of Ireland's Mammals follow the format outlined below:

- *Species name and taxonomic authority*
- *English language common name*
- *Irish language common name*
- *Irish status* – Red list status for Ireland based on this assessment
- *European status* – Red list status for Europe, based on Temple & Terry (2007)
- *Global status* – global Red List status, taken from IUCN Red List of Threatened Species (IUCN, 2019b)
- *Proportion of global population occurring in Ireland* – for species (or sub-species) with a significant proportion of their global populations occurring in Ireland. This is estimated based on available data for endemic and near endemic species, or best expert judgement for species with wider distributions.
- *Rationale for assessment* – a description of how the IUCN category was determined. This will include details of the previous red list status for Ireland, and the rationale behind any population trend estimates. This section should be read in conjunction with the IUCN guidance documents that were referred to for this assessment (IUCN, 2001; 2003; 2005; 2019a) and the previous Irish assessment (Marnell *et al.*, 2009).
- *Legal Status* – Any legal protection afforded to the species. This will be one or more of the following: EU Habitats Directive [92/43/EEC]; Wildlife Act, 1976; Wildlife (Amendment) Act, 2000; Game Preservation Act (Northern Ireland) 1928; The Wildlife (Northern Ireland) Order 1985. Where the species is covered by international laws (e.g. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)) this is also included. Legislated hunting seasons have been included where appropriate. For species listed on the EU Habitats Directive, the number of Special Areas of Conservation (SACs) for which the species is listed as a qualifying interest is also included.
- *Distribution* – a general description of the global distribution of the species, followed by a more detailed description of its distribution in Ireland.
- *Population in Ireland* – an estimate of the effective population size (i.e. adult population) in Ireland, where available, and a description of whether the population is stable, increasing or declining.
- *Ecology and habitat in Ireland* – a brief summary of the available ecological information for the species, including a description of the species' broad habitat preferences in Ireland.
- *Threats* – a brief outline of any significant threats to, or activities impacting on, the species conservation status in Ireland.

## Order Eulipotyphla

*Erinaceus europaeus* Linnaeus

**Common name:** Hedgehog

**Irish name:** Gráinneog

**Irish status:** Least Concern

**European status:** Least concern

**Global status:** Least concern

Photo: Mike Brocu



**Rationale for assessment:** Previously assessed as least concern (Marnell *et al.*, 2009). Widespread range across Ireland, increased records and the European status of least concern justify this assessment.

**Legal Status:** Wildlife Act, 1976; Wildlife (Amendment) Act, 2000; The Wildlife (Northern Ireland) Order 1985.

**Distribution:** Widespread range across all counties of Ireland, only absent from the Burren (Co Clare) and the blanket bogs of Connemara (Co Galway) and northwest Mayo and Donegal (Lysaght, 2016). Found throughout western Europe, coastal Scandinavia and parts of north-east Europe ([www.iucnredlist.org](http://www.iucnredlist.org)).

**Population in Ireland:** There is no population estimate for hedgehogs in Ireland, but frequent records are submitted to the National Biodiversity Data Centre.

**Ecology and habitat in Ireland:** Present in various lowland habitats, with sufficient food and nesting resources (Morris & Reeve, 2008). Common in suburban gardens and parks, and in woodland/grassland mosaics. Rare in bog or marshy habitat and coniferous woods. More likely in Ireland to utilise arable land than in other parts of their range (Haigh *et al.* 2012). Primarily nocturnal and solitary, eat a range of ground-living invertebrates, principally beetles, caterpillars, slugs and earthworms. Typically hibernate from late October to early April.

**Threats:** Hedgehogs are vulnerable to pesticides used in gardens, and many are killed by eating poisoned slugs. Severe winters may kill hibernating hedgehogs, and not reaching a sufficient weight before hibernating is also fatal. Many hedgehogs are recorded from roadkill deaths, although this is not thought to be impacting their populations. Recent reports of global loss of invertebrates could signify a major threat to their food supply (Eisenhauer *et al.*, 2019).

*Sorex minutus* Linnaeus

**Common name:** Pygmy shrew

**Irish name:** Dallóg fhraoigh

**Irish status:** Least concern

**European status:** Least concern

**Global status:** Least concern

Photo: Mike Brown



**Rationale for assessment:** Previously assessed as least concern (Marnell *et al.*, 2009). Widespread distribution, stable population, and the European status of least concern justify this assessment.

**Legal Status:** Wildlife Act, 1976; Wildlife (Amendment) Act, 2000; and The Wildlife (Northern Ireland) Order 1985.

**Distribution:** The pygmy shrew occurs throughout Europe except for southern Iberia and the Mediterranean coast. Their global distribution stretches across much of Russia, into Asia ([www.iucnredlist.org](http://www.iucnredlist.org)). They are common and widespread throughout the island of Ireland, although potentially a gap in their range is emerging, centred on Co Tipperary, where the invasive greater white-toothed shrew is established (McDevitt, 2016).

**Population in Ireland:** There is no population estimate available for pygmy shrew in Ireland, however the animals are frequently encountered and the population appears to be stable.

**Ecology and habitat in Ireland:** Pygmy shrews are solitary and extremely territorial. They are short-lived, with individuals over-wintering once, breeding in the summer of their second year, and dying before their second winter. They are active 24 hours a day in order to meet their nutritional requirement of up to 250 invertebrate items per day (McDevitt, 2016). Pygmy shrews are found in a variety of habitats from dunes and farmland, to suburban areas (Mitchell-Jones *et al.*, 1999). They require vegetative cover and a good supply of invertebrates.

**Threats:** The pygmy shrew has been impacted by the introduction of the greater white-toothed shrew, with populations having potentially collapsed in some areas as a result. There may also be a cumulative affect caused by the introduction of the bank vole (Montgomery *et al.*, 2012). The heavy use of pesticides, and the global decline in invertebrates are other potential threats, as they impact on their food supply.

## Order Chiroptera

*Myotis daubentonii* (Kuhl)

**Common name:** Daubenton's bat

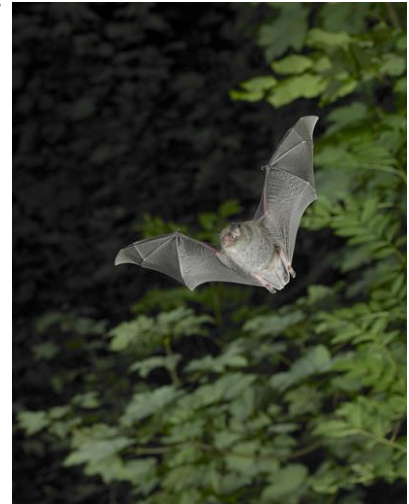
**Irish name:** Ialtóg uisce

**Irish status:** least concern

**European status:** least concern

**Global status:** least concern

Photo: Frank Greenaway



**Rationale for assessment:** Previously assessed as least concern (Marnell *et al.*, 2009). Widespread range across Ireland, no evidence of decline and the European status of least concern justify this assessment.

**Legal Status:** EU Habitats Directive [92/43/EEC] Annex IV; Wildlife Act, 1976; Wildlife (Amendment) Act, 2000; The Wildlife (Northern Ireland) Order 1985

**Distribution:** Found from western Europe to Japan and Korea; from Portugal and Italy to southern Scandinavia ([www.iucnredlist.org](http://www.iucnredlist.org)). Widespread in Ireland and found in all counties (Aughney *et al.*, 2018).

**Population in Ireland:** The population in Ireland is thought to be stable or increasing slightly (Aughney *et al.*, 2018), and is estimated to comprise 81,000-103,000 individuals (Roche *et al.*, 2014).

**Ecology and habitat in Ireland:** Roosts in small numbers in crevices under bridges and in old stone buildings near water (Roche *et al.*, 2014). Also reported from roofs of old houses (Allen *et al.*, 2000) and from bat boxes and tree crevices (McAney, 2006). Winter cave roosts have been reported (Hopkirk, 1996), but seldom recorded in hibernation as it roosts in cracks and crevices (McAney, 1994, 1997). A number of swarming sites have been identified (Roche *et al.*, 2014).

Normally forages along tree-lined rivers and over lakes; avoids uplands (Lundy *et al.*, 2011). The majority of the diet is made up of midges and caddis flies gaffed from the water surface or caught in the air using the tail membrane (Sullivan *et al.*, 1993; Flavin *et al.*, 2001; Warren *et al.*, 2000). Can also be found in other habitats, such as woodland (Russ, 1999).

**Threats:** Wetland drainage and serious water pollution are concerns; light pollution has also been shown to impact this species (Aughney *et al.*, 2012). Unsympathetic repairs to old bridges and disturbance during hibernation can impact local populations.

*Myotis mystacinus* (Kuhl)

**Common name:** Whiskered bat

**Irish name:** Ialtóg ghiobach

**Irish status:** least concern

**European status:** least concern

**Global status:** least concern

Photo: Frank Greenaway



**Rationale for assessment:** Previously assessed as least concern (Marnell *et al.*, 2009). Widespread range across Ireland, no evidence of decline and the European status of least concern justify this assessment.

**Legal Status:** EU Habitats Directive [92/43/EEC] Annex IV; Wildlife Act, 1976; Wildlife (Amendment) Act, 2000 ; The Wildlife (Northern Ireland) Order 1985.

**Distribution:** Mainly palaeartic; from northern Iberia and Morocco to far east. Absent from northern Scotland and northern Scandinavia ([www.iucnredlist.org](http://www.iucnredlist.org)). Records from throughout Ireland, from Donegal to Wexford, but not common. Roche *et al.* (2014) consider it to be widespread but very localised.

**Population in Ireland:** The population in Ireland is unknown (Roche *et al.*, 2014); previously estimated to comprise 5,000+ mature individuals (Marnell *et al.*, 2009). Trend unknown but assumed to be stable. No population monitoring programme in place.

**Ecology and habitat in Ireland:** Summer roosts are normally in buildings (Roche *et al.*, 2014) and a network of roosts can be utilised (Buckley *et al.*, 2013). Usually only small numbers of bats are present, often between rafters and felt and other narrow spaces where they are difficult to locate. Bridge roosts are also known (Smiddy, 1991; Shiel, 1999). Wintering animals are rarely found but a small number have been recorded in caves (McAney, 1994; 1997). Limited evidence of autumn swarming behaviour has been reported from Ireland (Roche *et al.*, 2014). Known to be a woodland species; tree lines, river corridors and farmland also used for foraging (Lundy *et al.*, 2011; Buckley *et al.*, 2013).

**Threats:** Lack of knowledge about roosting sites and swarming behaviour are concerns (Roche *et al.*, 2014). Building renovation and loss of foraging habitat are potential threats.



*Myotis nattereri* (Kuhl)

**Common name:** Natterer's bat

**Irish name:** Ialtóg Natterer

**Irish status:** least concern

**European status:** least concern

**Global status:** least concern

Photo: Frank Greenaway



**Rationale for assessment:** Previously assessed as least concern (Marnell *et al.*, 2009). Widespread range across Ireland, no evidence of decline and the European status of least concern justify this assessment.

**Legal Status:** EU Habitats Directive [92/43/EEC] Annex IV; Wildlife Act, 1976; Wildlife (Amendment) Act, 2000 ; The Wildlife (Northern Ireland ) Order 1985.

**Distribution:** A widespread species, found from Portugal and north-west Africa to the Urals and the near East ([www.iucnredlist.org](http://www.iucnredlist.org)). Widespread in Ireland, but not common. Roost and detector records from Donegal and Antrim to Wexford and Kerry (Roche *et al.* (2014).

**Population in Ireland:** The population in Ireland is unknown (Roche *et al.*, 2014); previously estimated to comprise 5,000+ mature individuals (Marnell *et al.*, 2009). Trend unknown but assumed to be stable. Effective monitoring programme needed.

**Ecology and habitat in Ireland:** Summer roosts are normally in buildings. Usually only small numbers of bats are present, often between rafters and felt and other narrow spaces where they are difficult to locate. Bridge roosts are also known (Roche *et al.*, 2014). Larger roosts (>50 bats) have been found in Church of Ireland churches (McAney, 2006). In winter individuals have been observed in bridges, mines and caves (McAney, 1994; 1997).

This bat gleans most of its prey from foliage, rather than catching it in the air (Shiel *et al.*, 1991). Woodland habitats and river corridors appear to be favoured for foraging. Pastures and hedgerows are also utilised although pasture-dominated landscapes are avoided (Lundy *et al.*, 2011, 2012; Roche *et al.*, 2014).

**Threats:** Further work on the ecology, habitat requirements and swarming behaviour of this species is required to determine whether it is at risk from specific threats (Roche *et al.* 2014). However, woodland management and building and bridge renovations are potential threats.

*Nyctalus leisleri* (Kuhl)

**Common name:** Leisler's bat

**Irish name:** Ialtóg Leisler

**Irish status:** least concern

**European status:** least concern

**Global status:** least concern

Photo: Frank Greenaway



**Rationale for assessment:** Previously assessed as Near Threatened due to the fact that Ireland is considered a world stronghold for the species (Marnell *et al.*, 2009). Its European status, widespread distribution in Ireland and recent data showing continuing population increase here (Roche *et al.*, 2014; Aughney *et al.*, 2018) justify this improved assessment.

**Legal Status:** EU Habitats Directive [92/43/EEC] Annex IV; Wildlife Act, 1976; Wildlife (Amendment) Act, 2000 ; The Wildlife (Northern Ireland.) Order 1985.

**Distribution:** Found throughout Europe except for Scandinavia, Estonia and Northern Russia. Ireland is considered to be the world stronghold for the species (Mitchell-Jones *et al.*, 1999). Occurs throughout the country; probably the third most common bat species (Roche *et al.*, 2011).

**Population in Ireland:** The population in Ireland appears to be increasing, and is estimated to comprise 70,000-130,000 mature individuals (Roche *et al.*, 2014; Aughney *et al.*, 2018). Irish population may constitute as much as 20-25% of global population (Marnell *et al.*, 2009), but few hard data from other European countries to confirm this.

**Ecology and habitat in Ireland:** Nursery roosts are usually in attics of buildings. Some tree roosts are also known. Will also occupy bat boxes (McAney, 2006). Hibernation in trees and buildings recorded (Hopkirk & Russ, 2004; McAney, 2006).

Wide variety of habitats used for foraging including pasture, canal, orchards, open water, roadside hedgerows and streetlights. Small to medium sized swarming insects make up much of the prey (Shiel *et al.*, 1998). Known to migrate long distances on European continent, but no evidence for migration in Irish population (Shiel *et al.*, 2008).

**Threats:** Accidental and deliberate exclusion of nursery roosts from buildings is the main threat to this species. Unsympathetic woodland management and wind farm developments also of concern (McAney, 2006; Roche *et al.*, 2014).



*Pipistrellus nathusii* (Keyserling & Blasius)

**Common name:** Nathusius' pipistrelle

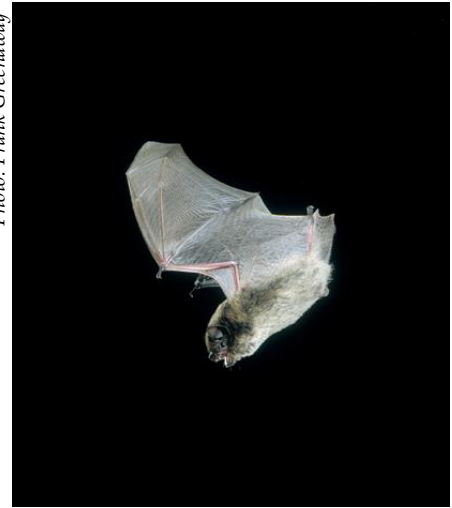
**Irish name:** Ialtóg Nathusius

**Irish status:** least concern

**European status:** least concern

**Global status:** least concern

Photo: Frank Greenaway



**Legal Status:** EU Habitats Directive [92/43/EEC] Annex IV; Wildlife Act, 1976; Wildlife (Amendment) Act, 2000 ; The Wildlife (Northern Ireland) Order 1985.

**Rationale for assessment:** Previously assessed as least concern (Marnell *et al.*, 2009). No evidence of decline and the European status of least concern justify this assessment.

**Distribution:** From Urals to Northern Iberia and southern Scandinavia to the Mediterranean (Mitchell-Jones *et al.*, 1999). Highly migratory, moving south-west for winter and returning to northern latitudes for spring. First recorded in Ireland in 1996; maternity colony located in 1997 in Co. Antrim (Russ *et al.*, 1998) confirmed it as a resident here. Most records from north-east, but also reported from many other counties (Roche *et al.*, 2014; Aughney *et al.*, 2018).

**Population in Ireland:** Records of the species continue to be collected annually by the car-based monitoring scheme (Roche *et al.*, 2015b), but insufficient data yet to provide any population trend. In Ireland, where the winters are mild, normal migratory behaviour may give way to sedentary lifestyle (Russ *et al.*, 1998). Resident bats may be supplemented during winter by migratory individuals returning from the north-east of the species range (Russ *et al.*, 2001). Roche *et al.* (2014) estimated the population at 10-18,000.

**Ecology and habitat in Ireland:** No known maternity roosts in the Republic. In Northern Ireland they occur in cavity walls / under slates of old stone buildings. On the continent they use hollow trees, bat and bird boxes, wooden churches and buildings during summer and crevices in cliffs, hollow trees and buildings in winter (McAney, 2006; Marnell & Presetnik, 2009; Russ, 2008). Considered a woodland species on mainland Europe but more associated with lakes in Ireland (Roche *et al.*, 2014); aquatic Diptera including non-biting midges appear to be its main prey. Also forages along woodland rides and edges.

**Threats:** Main threats include roost disturbance and destruction of insect-rich foraging habitats such as wetlands, riparian woodland and unimproved grassland. Badly sited windfarms may be a particular threat to this species given its migratory nature. More information on this species' migratory habitats are needed.

*Pipistrellus pipistrellus* (Schreber)

**Common name:** Common pipistrelle

**Irish name:** Ialtóg fheasrach

**Irish status:** least concern

**European status:** least concern

**Global status:** least concern

Photo: Frank Greenaway



**Rationale for assessment:** Previously assessed as least concern (Marnell *et al.*, 2009). Widespread range across Ireland, no evidence of decline and the European status of least concern justify this assessment.

**Legal Status:** EU Habitats Directive [92/43/EEC] Annex IV; Wildlife Act, 1976; Wildlife (Amendment) Act, 2000 ; The Wildlife (Northern Ireland) Order 1985.

**Distribution:** Occurs across much of western and central Europe and along the North African coast. Rare or absent in Scandinavia, Greece and Italy (Jones & Racey, 2008). Most frequently encountered species during Irish car-based monitoring. This monitoring suggests it may be most abundant in south and east, but found in all counties including the extreme west (Roche *et al.*, 2011; Aughney *et al.*, 2018).

**Population in Ireland:** Very common. The population in Ireland is increasing and is estimated to comprise 1-2 million mature individuals (Aughney *et al.*, 2018).

**Ecology and habitat in Ireland:** Summer roosts usually in buildings, including modern houses, old abandoned mansions, churches, amenity buildings and farm sheds (e.g. Roche, 1998; 2001; McGuire, 1998). Normally roost in very confined spaces, such as behind window sashes, under tiles and weather-boards, behind fascia and soffits, and within the cavities of flat roofs (O'Sullivan, 1994). Thought to hibernate in buildings and trees but seldom recorded in winter (McAney, 2006).

Forages in a broad range of habitat types including woodlands, lakes, rivers, grasslands and suburban parks (Russ & Montgomery, 2002; Guillot, 2003; Dick & Roche, 2017).

**Threats:** Use of pesticides; removal of hedgerows, copses and scrub; and illegal disturbance of roosts in domestic dwellings and other buildings are the main threats identified for these species.

*Pipistrellus pygmaeus* (Leach)

**Common name:** Soprano pipistrelle

**Irish name:** Ialtóg fheascrach sopránach

**Irish status:** least concern

**European status:** least concern

**Global status:** least concern

Photo: Frank Greenaway



**Rationale for assessment:** Previously assessed as least concern (Marnell *et al.*, 2009). Widespread range across Ireland, no evidence of decline and the European status of least concern justify this assessment.

**Legal Status:** EU Habitats Directive [92/43/EEC] Annex IV; Wildlife Act, 1976; Wildlife (Amendment) Act, 2000 ; The Wildlife (Northern Ireland) Order 1985.

**Distribution:** Occurs sympatrically with the common pipistrelle across much of central Europe, but while the soprano pipistrelle appears to be absent from much of France and northern Iberia, its range extends into southern Scandinavia and Greece (Jones & Racey, 2008). Abundant and widespread throughout Ireland, occurring in all counties (Roche *et al.*, 2014). No particular geographical preferences evident from most recent monitoring (Roche *et al.*, 2011; Aughney *et al.*, 2018).

**Population in Ireland:** Very common. The population in Ireland is increasing (Aughney *et al.*, 2018), and is estimated to comprise 0.54-1.2 million mature individuals (Roche *et al.*, 2014).

**Ecology and habitat in Ireland:** Summer roosts usually in buildings, including modern suburban houses, old abandoned mansions, churches, amenity buildings and farm sheds. Also recorded from bat boxes (e.g. Roche *et al.*, 2014). They normally roost in very confined spaces, such as behind window sashes, under tiles and weather-boards, behind fascia and soffits, and within the cavities of flat roofs (O'Sullivan, 1994). Roosts of >1000 soprano pipistrelles are known (McAney, 2006). Thought to hibernate in buildings and trees, but seldom recorded in winter (McAney, 2006).

Although known to forage in a broad range of habitat, *P. pygmaeus* shows some preference for aquatic habitats – riparian woodland, rivers and lakes (Russ & Montgomery, 2002; Lundy *et al.*, 2011; Dick & Roche, 2017).

**Threats:** Use of pesticides; removal of hedgerows, copses and scrub; and illegal disturbance of roosts in domestic dwellings and other buildings are the main threats identified for these species.

*Plecotus auritus* (Linnaeus)

**Common name:** Brown long-eared bat

**Irish name:** Ialtóg fhad-chluasach

**Irish status:** least concern

**European status:** least concern

**Global status:** least concern

Photo: Frank Greenaway



**Rationale for assessment:** Previously assessed as least concern (Marnell *et al.*, 2009). Widespread range across Ireland, no evidence of decline and the European status of least concern justify this assessment.

**Legal Status:** EU Habitats Directive [92/43/EEC] Annex IV; Wildlife Act, 1976; Wildlife (Amendment) Act, 2000 ; The Wildlife (Northern Ireland) Order 1985.

**Distribution:** Widespread across Europe with records from southern Portugal, Italy and Greece in the south to Scotland and southern Scandinavia in the north ([www.iucnredlist.org](http://www.iucnredlist.org)). Widely distributed throughout the island of Ireland (Aughney, 2016). It has also been recorded on several off-shore islands, and at Tuskar Lighthouse, Co. Wexford (Fairley, 2001).

**Population in Ireland:** The population in Ireland is thought to be stable or increasing slightly (Aughney *et al.*, 2018), and has been estimated at 64,000-115,000 individuals (Roche *et al.*, 2014).

**Ecology and habitat in Ireland:** Nursery roosts usually in churches and houses; large, open attics are preferred and a high degree of site fidelity is shown (Aughney *et al.*, 2012). Tend to cluster together, often in the angle created by the rafters where they join the ridge beam. Schwegler bat boxes are also used (McAney, 2006). Tree holes and farm buildings used as temporary roosts when food is in short supply (Entwistle *et al.*, 1997). The few hibernating records come from caves and from ruined buildings (McAney, 1994; 1997).

This species has broad habitat preferences, foraging in broad-leaved woodlands and along tree lines, but also scrub, conifer plantations, gardens with mature trees, parkland and orchards (McAney, 2006; Roche *et al.*, 2014). Main prey items include flies (craneflies and window-midges), moths, caddis flies and earwigs, centipedes and harvestmen (Shiel *et al.*, 1991).

**Threats:** Vulnerable to roost disturbance given their tendency to roost in buildings. Also considered to be particularly vulnerable to the chemicals used in timber treatment, because of their habit of roosting in close proximity to the timber (McAney, 2006).

Agricultural intensification (e.g. loss of hedgerows and scrub), unsympathetic woodland management practices and light pollution also pose a risk to this species (Roche *et al.*, 2014).

***Rhinolophus hipposideros*** (Bechstein)

**Common name:** Lesser horseshoe bat

**Irish name:** Ialtóg crúshronach/ Crú-ialtóg beag

**Irish status:** least concern

**European status:** Near Threatened

**Global status:** least concern

Photo: Frank Greenaway



**Rationale for assessment:** Previously assessed as least concern (Marnell *et al.*, 2009). Despite restricted range in west of Ireland, robust evidence of population increase and the global status of least concern justify this assessment.

**Legal Status:** EU Habitats Directive [92/43/EEC] Annex II & IV; 41 SACs listed. Wildlife Act, 1976; Wildlife (Amendment) Act, 2000.

**Distribution:** Widely distributed through western, central and southern Europe. Extends as far east as Kashmir and through northern Africa to Arabia, Ethiopia and Sudan ([www.iucnredlist.org](http://www.iucnredlist.org)). Ireland represents the most northerly and westerly limits of the species' distribution and here it is confined to six western counties: Mayo, Galway, Clare, Limerick, Cork and Kerry (McAney, 2016), with some evidence of a growing gap in north Kerry and west Limerick (NPWS 2019). It has the smallest core area of any Irish bat: 5,993 km<sup>2</sup> (Lundy *et al.*, 2011).

**Population in Ireland:** The population in Ireland appears to be increasing (Aughney *et al.*, 2018). It is estimated at approximately 13,000 mature individuals (NPWS, 2019). Some genetic evidence that population isolation is occurring within the wider distribution range (Dool *et al.*, 2013).

**Ecology and habitat in Ireland:** The lesser horseshoe bat is the only member of the Rhinolophidae occurring in Ireland. Summer roosting sites are often in the attics of old or derelict buildings. They are faithful to a roost site and will return to the same site each year. Hibernation sites are typically caves, souterrains, cellars and icehouses (Roche *et al.*, 2014; Kelleher, 2004).

Lesser horseshoes rely on linear landscape features (e.g. treelines, stonewalls and hedgerows) to navigate and commute from roosts to feeding sites and are reluctant to fly out in the open (Schofield, 2008). The bats forage on a range of insects predominantly in deciduous woodland and riparian vegetation normally within a few km of their roosts (McAney, 2016).

**Threats:** Lesser horseshoe bats are sensitive to disturbance and normally do not occupy the same buildings as humans. Loss of roosting sites due to deterioration or renovation of old buildings, loss of commuting routes linking roosts to foraging sites and unsympathetic management of foraging sites are the major threats to this species (Roche *et al.*, 2015a).



## Order Rodentia

*Apodemus sylvaticus* (Linnaeus)

**Common name:** Wood mouse

**Irish name:** Luch fhéir

**Irish status:** least concern

**European status:** least concern

**Global status:** least concern



Photo: Mike Brown

**Rationale for assessment:** Previously assessed as least concern (Marnell *et al.*, 2009). Widespread distribution, presence in broad range of habitats and the European status of least concern justify current assessment.

**Legal Status:** Not protected.

**Distribution:** Found across the continent of Europe, to the east of Ukraine, and the southern parts of Scandinavia. Also found in Iceland and along the northern coast of northwest Africa ([www.iucnredlist.org](http://www.iucnredlist.org)). Ubiquitous in Ireland, including many offshore islands (Montgomery, 2016a).

**Population in Ireland:** There is no population estimate available for Ireland, however there is no evidence of a population decline. Population densities can reach up to 40 individuals per hectare (Flowerdew & Tattersall, 2008).

**Ecology and habitat in Ireland:** Wood mice can be found in wide range of habitats from sand dunes to their preferred forest habitat (Montgomery, 2016a). They are rare or absent in boggy wet conditions. They are frequently found in urban gardens and parks. They are mainly nocturnal, and diet includes seeds, fruit, buds and a range of invertebrates. They are a very important component of the diet of several carnivorous mammals and birds, due to the lack of alternative rodent species.

**Threats:** There is some evidence that they have been negatively impacted by the dual invasion of bank voles and greater white-toothed shrews in certain areas (Montgomery *et al.*, 2012), however, this could be offset by the resulting reduction in predation pressure due to alternative food sources for the carnivores.

*Mus musculus* Linnaeus

**Common name:** House mouse

**Irish name:** Luch thí

**Irish status:** least concern

**European status:** least concern

**Global status:** least concern



Photo: Eddie Dunne

**Rationale for assessment:** Previously assessed as least concern (Marnell *et al.*, 2009). Widespread distribution, association with human settlement and the European and global status of least concern justify this assessment

**Legal Status:** Not protected.

**Distribution:** Found globally across all continents, other than Antarctica. Absent from equatorial Africa and central South America ([www.iucnredlist.org](http://www.iucnredlist.org)). Also introduced to many islands. Found throughout Ireland, including inhabited offshore islands, but tend to die out where islands are no longer populated by people (Montgomery, 2016b).

**Population in Ireland:** Numbers are highly variable, but the population overall is stable.

**Ecology and habitat in Ireland:** They are usually closely associated with human dwellings, and do not seem to compete with wood mice in woodlands, or even in many urban parks. They are opportunistic omnivores, feeding on many human foods and refuse (Berry *et al.* 2008).

**Threats:** Can be the target of rodenticides, although they do show some resistance. They are significant pests due to the contamination of food stores, destruction of crops, structural damage and as a vector of several bacterial and parasitic diseases (Meerburg *et al.*, 2009). They are often the focus of attempts at pest control.

*Rattus rattus* (Linnaeus)

**Common name:** Black rat; Ship rat

**Irish name:** Francach dubh

**Irish status:** Vulnerable (D2)

**European status:** least concern

**Global status:** least concern



Photo: Eddie Dunne

**Rationale for assessment:** Previously assessed as vulnerable (Marnell *et al.*, 2009). Restricted to a single locality, but still found at that locality, so status remains unchanged.

**Legal Status:** Not protected.

**Distribution:** Globally, black rats are found across southern European and Asian countries. Also found in south-east Asia and Japan, and many coastal African countries ([www.iucnredlist.org](http://www.iucnredlist.org)). Only recent Irish records come from Lambay Island off the coast of Dublin, where it persists (S. Newton pers. comm.). Used to be much more widespread in Ireland before the 18<sup>th</sup> century introduction of the brown rat, which may be impacting on numbers in Lambay currently.

**Population in Ireland:** Thought to be stable, with seasonal fluctuations, but numbers could be declining.

**Ecology and habitat in Ireland:** Mostly associated with human habitation across its global range, in particular ports. Previously was very commonly found on ships, before modernisation of marine vessels. They are opportunistic omnivores, feeding in particular on stored grain as well as seeds, fruit and invertebrates. Have been noted to target seabird chicks and eggs during the nesting season on Lambay Island (Marnell, 2016a).

**Threats:** The potential impact on ground-nesting seabirds has brought the black rat into conflict with bird conservation interests.

Globally and historically they have been an important vector of human disease including the plague. They can be a major pest through structural damage and contamination of stored foods.



*Sciurus vulgaris* Linnaeus

**Common name:** Red squirrel

**Irish name:** Iora rua

**Irish status:** least concern

**European status:** least concern

**Global status:** least concern

Photo: Eddie Dunne



**Rationale for assessment:** Previously assessed as 'near threatened' due to a 20% decline in range in Ireland since the introduction of the grey squirrel (Marnell *et al.* 2009). Recent surveys however have shown the red squirrel has expanded its range once again in the midlands of Ireland, following the loss of grey squirrels in those areas (Lawton *et al.*, 2015). This recovery, plus the overall widespread distribution across the island of Ireland justify a change of status to least concern.

**Legal Status:** Wildlife Act, 1976; Wildlife (Amendment) Act, 2000; The Wildlife (Northern Ireland) Order 1985.

**Distribution:** Found across the Palearctic, from Ireland to Japan. Absent in Europe from some parts of Iberia and much of England and Wales. Red squirrels are widespread across Ireland, where there is sufficient canopy cover and connectivity between woods. May still be absent from some parts of the midlands where the grey squirrel has longest been established, but there has been a considerable recovery due to the recent regional decline of greys (Lawton *et al.* 2015, Lawton, 2016).

**Population in Ireland:** Previously estimated at 40,000 individuals (NPWS & EHS, 2008); current figure may be higher in correlation with the recent range expansion.

**Ecology and habitat in Ireland:** Associated very closely with forests and general tree cover, red squirrels have had a mixed history in Ireland due to deforestation. Feed on seeds of conifer and broadleaf trees; are found in higher densities in broadleaved woodland, but are particularly prone to grey squirrel competition in this habitat. In coniferous habitat they can survive at low densities where the introduced grey squirrel cannot become established. Female red squirrels produce one or two litters a year, depending on food availability, and can live up to 6 years of age (Gurnell *et al.* 2008).

**Threats:** Due to their close association with forest habitat, red squirrel is very severely impacted by deforestation; its abundance is directly related to woodland available. Invariably lose out to grey squirrel populations in broadleaf and mixed wood habitat, due to competition and the impact of squirrel pox virus, which is carried by the grey squirrel.

## Order Carnivora

*Canis lupus* Linnaeus

**Common name:** Grey wolf

**Irish name:** Mac tíre

**Irish status:** Regionally Extinct

**European status:** least concern

**Global status:** least concern



*Photo: Dublin Zoo*

**Rationale for assessment:** previously assessed as regionally extinct (Marnell *et al.*, 2009). No change.

**Distribution:** Holarctic, from Scandinavia and Mediterranean through Russia and south and central Asia to North America (Mitchell-Jones *et al.*, 1999).

**Population in Ireland:** Once widespread in Ireland, but de-forestation and hunting reduced the population. Active persecution during 17<sup>th</sup> century, brought about extinction, with the last animal reportedly shot in Co. Carlow in 1786 (Fairley, 1984; Hickey, 2016).

*Lutra lutra* (Linnaeus)

**Common name:** Otter

**Irish name:** Dobharchú

**Irish status:** least concern

**European status:** Near Threatened

**Global status:** Near Threatened

Photo: Eddie Dunne



**Legal Status:** EU Habitats Directive [92/43/EEC] Annex II & IV. Nine SACs listed for otter in N.I., 47 listed in RoI. Wildlife Act, 1976; Wildlife (Amendment) Act, 2000; The Wildlife (Northern Ireland) Order 1985; CITES Appendix 1.

**Rationale for assessment:** Previously assessed as Near Threatened (Marnell *et al.*, 2009) based on a 20-25% decline between 1980 and 2005 (Bailey & Rochford, 2006). More recent data showing population recovery and widespread distribution, justify this improved assessment of least concern (Reid *et al.*, 2013; NPWS, 2019).

**Distribution:** Widespread species ranging from Ireland to Japan and Indonesia, and from the Arctic to north Africa ([www.iucnredlist.org](http://www.iucnredlist.org)). Found throughout Ireland in freshwater and coastal habitats, including offshore islands (Preston *et al.*, 2004; Marnell, 2016b; Reid *et al.*, 2013).

**Population in Ireland:** This species appeared to decline between 1980 and 2006, with most of that occurring in the first decade (i.e. 1980-1990), although the cause of this decline was unclear (Bailey & Rochford, 2006). The most recent national survey indicated a full recovery and an adult population size in the order of 16-22,000 individuals (Reid *et al.*, 2013).

**Ecology and habitat in Ireland:** Although seldom seen, can be found wherever there is suitable aquatic prey and nearby terrestrial cover for resting undisturbed. Occurs on rivers, lakes, canals and coasts throughout the country, even in urban areas (Marnell, 2016b). An opportunistic predator. Favoured prey includes sticklebacks, salmonids, frogs, eels and crayfish, while rockling and wrasse make up much of the diet along the coast (Bailey & Rochford, 2006; Reid *et al.*, 2013).

**Threats:** Many otters are killed on the roads each year; a smaller number are killed in fishing nets and lobster pots (Poole *et al.*, 2007). Severe water pollution incidents leading to fish kills and removal of riparian habitats reduce habitat suitability for otters.

*Martes martes* (Linnaeus)

**Common name:** Pine marten

**Irish name:** Cat crainn

**Irish status:** least concern

**European status:** least concern

**Global status:** least concern

Photo: Eddie Dunne



**Rationale for assessment:** Previously assessed as least concern (Marnell *et al.*, 2009). Expert opinion and survey data from 2005-07 (O'Mahony *et al.*, 2012) 2012 (Lawton *et al.*, 2015) and 2010-2015 (O'Mahony, 2016) confirms range expansion and continued status of least concern.

**Legal Status:** EU Habitats Directive [92/43/EEC] Annex V; Wildlife Act, 1976; Wildlife (Amendment) Act, 2000 ; The Wildlife (Northern Ireland.) Order 1985.

**Distribution:** Found across much of Europe into western Siberia, Caucasus and Asia Minor. Absent from southern Iberia and Greece. Irish population exists at the western edge of global geographic distribution (O'Mahony *et al.*, 2012).

Comparisons with historical data indicate that range expansion in Ireland has continued in recent decades. Core populations exist in the west and midlands with smaller populations in the south west and south east of the country (Sheehy *et al.*, 2014; O'Mahony, 2016). In the North, well established in Fermanagh and Tyrone, with increase in sightings from both Antrim and Down.

**Population in Ireland:** The population is thought to be increasing. Most recently estimated at 3,000 (O'Mahony *et al.*, 2017) however this may be a significant underestimate (Josh Twining, Pers Comm.).

**Ecology and habitat in Ireland:** Woodland and scrub habitats favoured. Commercial conifer plantations an important habitat resource in Ireland. Occasional sightings in urban areas and mature gardens. Dens in hollow trees, burrows, brash and buildings.

Opportunistic feeder on small mammals, berries, nuts, frogs, lizards, birds and invertebrates. Impact of increased abundance and predation on grey squirrels likely to benefit red squirrel populations (Sheehy & Lawton 2014, Sheehy *et al.*, 2018).

**Threats:** Suffered extensive persecution before legal protection. Recent expansion may bring renewed threat of persecution from gun clubs and poultry keepers. Tendency to den in houses has led to conflict as the species spreads.

Habitat loss and fragmentation a concern. Woodland management practices also important.



*Meles meles* (Linnaeus)

**Common name:** Badger

**Irish name:** Broc

**Irish status:** least concern

**European status:** least concern

**Global status:** least concern

Photo: Mike Brown



**Rationale for assessment:** Previously assessed as least concern (Marnell *et al.*, 2009). Despite localised removals for TB management, badger remains widespread, in a broad range of habitats.

**Legal Status:** Wildlife Act, 1976; Wildlife (Amendment) Act, 2000; The Wildlife (Northern Ireland) Order 1985.

**Distribution:** Widespread across Europe and Asia, but absent from Iceland, northern Scandinavia and the islands of the Mediterranean (Delahay *et al.*, 2008). Found throughout Ireland in areas of suitable habitat (Lysaght and Marnell, 2016).

**Population in Ireland:** Stable population, estimated in Northern Ireland as 33,500 (Reid *et al.*, 2008) and in the Republic of Ireland as 84,000 (Sleeman *et al.*, 2009).

**Ecology and habitat in Ireland:** Adaptable species of lowland grassland and woodland habitats, also occasionally in upland and suburban areas. Group size typically 4-5 animals (Feore, 1994; Smal, 1995). In Northern Ireland, hedgerows are most important habitat for sett location, reflecting the lack of woodland and abundance of hedgerow (Feore, 1994).

Opportunistic foragers that exploit a broad range of prey. Earthworms are common in the diet but account for little of the bulk. Seasonally abundant food sources are important including insect larvae and frogs (Cleary *et al.*, 2009). Vertebrates (wood mice, rabbits) form main food source during summer months (Kostka 2012). Digestible plant material (fruit and grains) may play a much more important role in unimproved habitats (Kostka 2012).

**Threats:** No natural predators in Ireland. Anthropogenic threats include illegal persecution (snaring, hunting with dogs, disturbance of setts) and road casualties.

Bovine tuberculosis is present in the Irish badger population. Roadkill analysis from specimens in the North suggests an infection rate of 15% (Courcier *et al.*, 2018) however, a wide range of localised differences occur. Badger removal programmes in response to TB outbreaks in cattle have been operated by Department of Agriculture in Republic of Ireland. A badger vaccine programme is currently being rolled out and is due to replace culling by 2021 (DAFM 2018). The Department for Agriculture Environment and Rural Affairs (NI) are currently considering badger TB control options for Northern Ireland.

*Mustela erminea hibernica* Thomas & Barrett-Hamilton

**Common name:** Irish stoat

**Irish name:** Easóg

**Irish status:** least concern

**European status:** least concern [*M. erminea*]

**Global status:** least concern [*M. erminea*]



**Proportion of global population in Ireland:** Near endemic sub-species (also occurs in Isle of Man). >90% of global population estimated to occur in Ireland.

**Rationale for assessment:** Previously assessed as least concern (Marnell *et al.*, 2009). Added conservation value because of its status as near endemic, but widespread distribution and presence in broad range of habitats justify current Irish assessment.

**Legal Status:** Wildlife Act, 1976; Wildlife (Amendment) Act, 2000; The Wildlife (Northern Ireland) Order 1985.

**Distribution:** *Mustela erminea* has a circumpolar distribution and is found throughout Europe except for the Mediterranean ([www.iucnredlist.org](http://www.iucnredlist.org)). Several subspecies are recognised including *hibernica*, which is restricted to Ireland and the Isle of Man (Martinkova *et al.*, 2007). Widespread throughout Ireland, with records from every county. Distribution locally limited only by the availability of suitable cover and sufficient food (Sleeman, 2016).

**Population in Ireland:** No population estimate available for Ireland, but no evidence of a decline. Population density variable, depending largely on the density of available food.

**Ecology and habitat in Ireland:** Primarily carnivorous, feeding on small mammals and birds. Able to kill prey several times own weight (e.g. rabbit). Solitary, territorial species. Breed once a year, with kits born in April or May. Adult females return to breeding condition soon after birth of litter (Hayden & Harrington, 2000). Found in wide variety of habitats from coastal grasslands to woodlands and uplands. Tends to avoid open habitats, travelling along hedgerows and stone walls.

Archaeological records from before last glaciation [27-35,000BP] and around time of last cold interstadial [10,000BP] (McDonald & King, 2008) suggests that if this species did not survive the glacial maximum in Ireland it was certainly, along with the hare, among the earliest colonists.

**Threats:** Persecution by game-keepers can be a problem locally, because of perceived threat to game birds.

*Vulpes vulpes* (Linnaeus)

**Common name:** Red fox

**Irish name:** Sionnach

**Irish status:** least concern

**European status:** least concern

**Global status:** least concern



**Rationale for assessment:** Previously assessed as least concern (Marnell *et al.*, 2009). Widespread distribution, presence in broad range of habitats and the European status of least concern justify current Irish assessment.

**Legal Status:** Not protected.

**Distribution:** Occurs throughout much of Northern Hemisphere. Widespread in Europe bar some Mediterranean islands (Baker & Harris, 2008). Distributed throughout Ireland and found in all counties (Looney, 2016).

**Population in Ireland:** Accurate statistics not available, but breeding population estimated at 150,000 to 200,000 (Hayden & Harrington, 2000). There is no evidence of a decline.

**Ecology and habitat in Ireland:** Adept opportunist, typically found in woodland habitat and grassland areas, but with increasing presence in urban areas. Rabbits and sheep carrion important dietary components in upland areas, but wide ranging diet including various bird, insect and plant species (Looney, 2001; O'Mahony 2003). Fox predation on lambs (as opposed to post mortem scavenging) is likely to be at low levels on a countrywide basis (Looney, 2001).

Vixens in Northern Ireland conceive between mid-January and mid-February with an average litter size of 4-5 cubs (Looney, 2001). Average male life expectancy 18 months, females 23 months (Looney, 2001).

**Threats:** Hunted throughout Ireland for sporting or livestock protection purposes. Unlikely to have a significant effect on the general population, although activities such as spotlight shooting with rifles may have significant local effects. Recent political interest in consideration of foxhunting ban in Northern Ireland. Previously large numbers of fox pelts were exported for the fur trade but this practice decreased during the 1980s (Hayden & Harrington, 2000).

Sarcoptic mange may exert a significant influence on urban populations. *Trichinella* also confirmed as present in Irish fox population but at very low levels (Zimmer *et al.*, 2009).

*Halichoerus grypus* (Fabricius)

**Common name:** Grey seal

**Irish name:** Rón glas

**Irish Red list status:** least concern

**European Red list status:** least concern

**Global Red list status:** least concern



Photo: Eddie Dunne

**Rationale for assessment:** Not previously assessed. Widespread distribution and no evidence of population decline justify current Irish assessment.

**Legal status:** EU Habitats Directive [92/43/EEC] Annex II & V. 1 SAC designated in NI; 10 in RoI. Wildlife Act, 1976; Wildlife (Amendment) Act, 2000 ; The Wildlife (Northern Ireland) Order 1985.

**Distribution:** Found on both sides of the North Atlantic. In Europe its range spreads from the Russian White Sea around coast of Norway and Iceland and down to north coast of France ([www.iucnredlist.org](http://www.iucnredlist.org)).

Found all around the Irish coastline but mainly along the western seaboard, with largest colonies on offshore islands such as Inishkeas, Co. Mayo and Blaskets, Co. Kerry. Can migrate significant distances and has been observed offshore as far as the edge of the continental shelf (Cronin, 2016).

**Population in Ireland:** Most recent population estimate of 7,000-9,000 individuals (O’Cadhla *et al.*, 2013) with some suggestion of an increasing trend (NPWS 2019). Significant movement between Scotland and Ireland and Ireland and France (O’Cadhla, 2016a).

**Ecology and habitat in Ireland:** Comes ashore at undisturbed sites, notably offshore islands, to rest, breed and moult. Pups born on beaches during breeding season (Sep-Dec). Pups nursed for c20 days before foraging independently. Adults can dive to 300m for food. Wide variety of prey items taken, but mainly gadoids and sandeels (Cronin, 2016).

**Threats:** Vulnerable to human disturbance during breeding season. Can be subject to bycatch in certain types of inshore fishing operations (Cosgrove *et al.*, 2016). Occasional incidents of persecution.



*Phoca vitulina* Linnaeus

**Common name:** Harbour seal

**Irish name:** Rón beag

**Irish Red list status:** least concern

**European Red list status:** least concern

**Global Red list status:** least concern



Photo: DAERA Marine and Fisheries Division

**Rationale for assessment:** Not previously assessed. Widespread distribution and no evidence of population decline justify current Irish assessment.

**Legal status:** EU Habitats Directive [92/43/EEC] Annex II & V. 2 SACs designated in NI; 13 in RoI. Wildlife Act, 1976; Wildlife (Amendment) Act, 2000 ; The Wildlife (Northern Ireland) Order 1985.

**Distribution:** Found throughout coastal waters of the northern hemisphere, from temperate to polar regions ([www.iucnredlist.org](http://www.iucnredlist.org)). In Europe, this species occurs from Svalbard and northern Russia to Iceland and south to France.

Found all around the Irish coastline, including estuaries and many offshore islands. Most records come from beaches used as haul out sites (O’Cadhla, 2016b).

**Population in Ireland:** The most recent population estimate of 4,500-6,500 comes from haul-out site monitoring (O’Cadhla, 2016b). The population trend is considered to be stable or increasing (Morris & Duck, 2019).

**Ecology and habitat in Ireland:** Annual breeding season extends from May through the summer followed by a moulting period (Aug-Sep). Opportunistic foragers on a wide variety of fish and, to a lesser extent, crustaceans and molluscs.

**Threats:** Vulnerable to disturbance at haul-out sites, especially during moult. Can be subject to bycatch in certain types of inshore fishing operations, although this appears to be less common than in grey seals (Cosgrove *et al.*, 2016).

## Order Lagomorpha

*Lepus timidus hibernicus* Bell

**Common name:** Irish hare

**Irish name:** Giorria

**Irish status:** least concern

**European status:** least concern [*L. timidus*]

**Global status:** least concern [*L. timidus*]

Photo: Mike Broton



**Proportion of global population in Ireland:** 100%. Despite some debate about taxonomic status of the mountain hare in Ireland, latest evidence indicates that *Lepus timidus hibernicus* is a valid subspecies and is endemic to Ireland (Hamill *et al.*, 2006; Montgomery *et al.*, 2014).

**Rationale for assessment:** Comprehensive distribution and abundance data is available. Previously assessed as least concern (Marnell *et al.*, 2009). Widespread distribution and large population justify retention of this assessment.

**Legal Status:** EU Habitats Directive [92/43/EEC] Annex V; Wildlife Act, 1976; Wildlife (Amendment) Act, 2000; The Wildlife (Northern Ireland) Order 1985. Game Preservation Act (Northern Ireland), 1928 Open season, (NI) 12<sup>th</sup> Aug – 31<sup>st</sup> Jan (RoI): 26 Sept - 28 Feb.

**Distribution:** *Lepus timidus* is a Northern Palaearctic species, found from Ireland and Scotland across Scandinavia and Russian Federation to Japan. Also in the Alps ([www.iucnredlist.org](http://www.iucnredlist.org)). *L. t. hibernicus* is widespread across Ireland including a number of offshore islands (Jeffrey, 2016).

**Population in Ireland:** Stable, but with population fluctuations. Most recent estimates of 27,400 for Northern Ireland (Reid *et al.*, 2009) and 223,000 for the Republic (McGowan, 2019).

**Ecology and habitat in Ireland:** Adaptable with a broad habitat niche spanning coastal dunes, amenity grasslands and upland heaths. Reaches highest densities in mixed farmland with hedgerows and other cover (Jeffrey, 2016). Breeding season extends from January to September. Population studies have confirmed the potential for wide annual fluctuations. (NIEA, unpublished data; Reid *et al.*, 2007a).

**Threats:** Modern agricultural methods (e.g. silage cutting), may increase mortality, particularly of juveniles. Habitat loss and fragmentation lead to isolation and inbreeding. Confirmation in mid-2019 of RHD2 in Irish hares presents a new concern.

Confirmation of hybridisation with established brown hare (*Lepus europaeus*) populations in N. Ireland is significant concern (Hughes *et al.*, 2009; Reid & Montgomery, 2007). Further work on impact of coursing on breeding dynamics and dispersal required.

*Oryctolagus cuniculus* (Linnaeus)

**Common name:** Rabbit

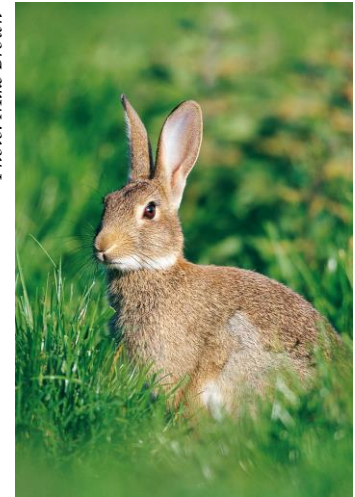
**Irish name:** Coinín

**Irish status:** least concern

**European status:** Near Threatened

**Global status:** Near Threatened

Photo: Mike Brown



**Rationale for assessment:** Previously assessed as least concern (Marnell *et al.*, 2009). Widespread distribution and presence in broad range of habitats justify retention of this assessment.

**Legal Status:** Not protected.

**Distribution:** Original range limited to Iberia. Following introductions and natural spread, now found throughout western Europe, bar northern Scandinavia and most of the Balkan countries (Mitchell-Jones *et al.*, 1999; [www.iucnredlist.org](http://www.iucnredlist.org)).

First introduced into Ireland by the Normans in the 12<sup>th</sup> century. Now found in all counties, including many off-shore islands, but appears to be most common in south and east (Marnell & Lysaght, 2016).

**Population in Ireland:** While there is no population estimate available for Ireland, there is no evidence of a population decline. Stable, but with large natural population fluctuations.

**Ecology and habitat in Ireland:** Found in a wide range of habitats, although appears to avoid coniferous forest. Feeds on a variety of plants including cereals, crops and young trees, but with a strong preference for grasses. Can exert a major influence on plant communities and at high densities prevent the proliferation of scrubland species.

Mainly nocturnal, although often diurnal in areas with low levels of disturbance. Prefers relatively well drained soils for burrows although may occasionally nest in dense cover. May breed throughout the year, but main season extends from January to August (Marnell & Lysaght, 2016).

**Threats:** Predated on by a wide range of species, including fox, stoat, badger, domestic/feral cat and buzzard (Marnell & Lysaght, 2016). Widely regarded as an agricultural pest and hunted with dogs, shot, trapped and snared. At high densities may damage coastal habitats.

Becoming increasingly immune to myxomatosis. Rabbits studied in Northern Ireland in the 1990s appeared to have immunity to viral haemorrhagic disease (A. Bell, pers. comm.), but recent confirmation of RHD2 related mortality in Ireland is a new threat.

## Order Cetartiodactyla

*Cervus elaphus* Linnaeus

**Common name:** Red deer

**Irish name:** Fia rua

**Irish status:** least concern

**European status:** least concern

**Global status:** least concern



Photo: Mike Brown

**Rationale for assessment:** Previously assessed as least concern (Marnell *et al.*, 2009). Several populations across the island of Ireland and widespread global population of least concern justify this assessment.

**Legal Status:** Wildlife Act, 1976; Wildlife (Amendment) Act, 2000 ; The Wildlife (Northern Ireland.) Order 1985.

Open season (RoI): Stags: 1 September - 31 December (except Kerry); Hinds: 1 November - 28 February.

Close season (NI): Stags: 1 May - 31 July; Hinds: 1 April - 31 October

**Distribution:** Mainly found across Europe, but also introduced to several countries including in Asia, Oceania and South America ([www.iucnredlist.org](http://www.iucnredlist.org)). In Ireland, established populations in Donegal, Galway, Kerry and Wicklow, with smaller scattered populations in most other counties. Very large expansion between 1978 and 2008 (Carden *et al.*, 2011) appears to have stabilised in last ten years.

**Population in Ireland:** No national census is available, but population appears stable after a recent expansion (Carden *et al.*, 2011).

**Ecology and habitat in Ireland:** In upland areas, red deer are found in open moorland and woodland (Burkitt, 2016). Use conifer plantations and secluded woodlands for shelter during winter, when they move to lower altitudes. Opportunistic browser and grazer feeding on a range of vegetation including tree shoots, grasses, heather, leaves of oak and holly as well as acorns and fruit.

**Threats:** Can hybridise with sika deer, although this does not occur at the levels first feared (McDevitt *et al.*, 2009b). Damage caused to forestry and potential traffic collisions leads to calls for population culls.

*Dama dama* (Linnaeus)

**Common name:** Fallow deer

**Irish name:** Fia buí

**Irish Red list status:** least concern

**European Red list status:** least concern

**Global Red list status:** least concern



Photo: Eddie Dunne

**Rationale for assessment:** Previously assessed as least concern (Marnell *et al.*, 2009). Widespread distribution, and the European assessment of least concern, justify this assessment.

**Legal Status:** Wildlife Act, 1976; Wildlife (Amendment) Act, 2000; Wildlife (N.I.) Order of 1985.

Open season (RoI): Bucks: 1<sup>st</sup> September to 31<sup>st</sup> December (except Kerry); Does: 1<sup>st</sup> November to 28<sup>th</sup> February.

Close season (NI): Bucks: 1<sup>st</sup> May to 31<sup>st</sup> July; Does: 1<sup>st</sup> March to 31<sup>st</sup> October.

**Distribution:** Found throughout Europe, having originated in Asia minor. Also introduced in several countries worldwide, including United States, Uruguay and New Zealand ([www.iucnredlist.org](http://www.iucnredlist.org)). Introduced to Ireland in the 13<sup>th</sup> Century, and several managed populations in deer parks still exist. Have established and spread in the wild through the lowlands of many Irish counties, excluding Kerry and Wexford. Good evidence of range expansion in a number of areas (Carden *et al.* 2011).

**Population in Ireland:** No national population data is available, several thousand are shot under licence annually, with no apparent impact on their overall numbers.

**Ecology and habitat in Ireland:** Found in lowland habitats including open grassland and varying levels of vegetative cover, including deciduous and mixed-open woodlands (Carden, 2016). Predominantly grazers, but will also browse leaves, herbs and feed on nuts and berries in autumn. Small stable groups may merge into large herds where conditions are favourable.

**Threats:** Can damage woodland, in particular young broadleaf plantations, bringing them into conflict with forest managers and owners. Large population densities can lead to overgrazing, impacting on ground flora and forest regeneration.

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## Appendix 1 – Criteria used to evaluate whether a taxon belongs in a threatened category (IUCN, 2019a)

<b>A. Population size reduction. Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4</b>			
	Critically Endangered	Endangered	Vulnerable
<b>A1</b>	≥ 90%	≥ 70%	≥ 50%
<b>A2, A3 &amp; A4</b>	≥ 80%	≥ 50%	≥ 30%
<p><b>A1</b> Population reduction observed, estimated, inferred, or suspected in the past where the causes of the reduction are clearly reversible AND understood AND have ceased.</p> <p><b>A2</b> Population reduction observed, estimated, inferred, or suspected in the past where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.</p> <p><b>A3</b> Population reduction projected, inferred or suspected to be met in the future (up to a maximum of 100 years) [(a) cannot be used for A3].</p> <p><b>A4</b> An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.</p>	<i>based on any of the following:</i>		<p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy (AOO), extent of occurrence (EOO) and/or habitat quality</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.</p>
<b>B. Geographic range in the form of either B1 (extent of occurrence) AND/OR B2 (area of occupancy)</b>			
	Critically Endangered	Endangered	Vulnerable
<b>B1. Extent of occurrence (EOO)</b>	< 100 km <sup>2</sup>	< 5,000 km <sup>2</sup>	< 20,000 km <sup>2</sup>
<b>B2. Area of occupancy (AOO)</b>	< 10 km <sup>2</sup>	< 500 km <sup>2</sup>	< 2,000 km <sup>2</sup>
<b>AND at least 2 of the following 3 conditions:</b>			
(a) Severely fragmented OR Number of locations	= 1	≤ 5	≤ 10
(b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals			
(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals			
<b>C. Small population size and decline</b>			
	Critically Endangered	Endangered	Vulnerable
<b>Number of mature individuals</b>	< 250	< 2,500	< 10,000
<b>AND at least one of C1 or C2</b>			
<b>C1. An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future):</b>	25% in 3 years or 1 generation (whichever is longer)	20% in 5 years or 2 generations (whichever is longer)	10% in 10 years or 3 generations (whichever is longer)
<b>C2. An observed, estimated, projected or inferred continuing decline AND at least 1 of the following 3 conditions:</b>			
(a) (i) Number of mature individuals in each subpopulation	≤ 50	≤ 250	≤ 1,000
(ii) % of mature individuals in one subpopulation =	90–100%	95–100%	100%
(b) Extreme fluctuations in the number of mature individuals			
<b>D. Very small or restricted population</b>			
	Critically Endangered	Endangered	Vulnerable
<b>D. Number of mature individuals</b>	< 50	< 250	<b>D1.</b> < 1,000
<b>D2. Only applies to the VU category</b> Restricted area of occupancy or number of locations with a plausible future threat that could drive the taxon to CR or EX in a very short time.	-	-	<b>D2.</b> typically: AOO < 20 km <sup>2</sup> or number of locations ≤ 5
<b>E. Quantitative Analysis</b>			
	Critically Endangered	Endangered	Vulnerable
<b>Indicating the probability of extinction in the wild to be:</b>	≥ 50% in 10 years or 3 generations, whichever is longer (100 years max.)	≥ 20% in 20 years or 5 generations, whichever is longer (100 years max.)	≥ 10% in 100 years

1 Use of this summary sheet requires full understanding of the *IUCN Red List Categories and Criteria* and *Guidelines for Using the IUCN Red List Categories and Criteria*. Please refer to both documents for explanations of terms and concepts used here.

## Appendix 2 – Checklist of terrestrial mammals

**Category** – All terrestrial mammals referenced in the text are listed and assigned to the following categories: Native/naturalised – all species native to Ireland or naturalised in Ireland before 1500 i.e. the species which were assessed; Post-1500 – the species introduced to Ireland by man after 1500; Vagrant – only single records confirmed; Feral – species originating from escaped domestic stock. See Pg 5 *Taxonomic and geographic scope* for full details. **IRL 2019 Status** - Red list status for Ireland based on this assessment; RE - Regionally Extinct, VU – Vulnerable, NT - Near threatened, DD - Data deficient, LC – Least Concern; NA – Not Assessed. **EU Status** - Red list status for Europe, based on Temple & Terry (2007); **Global Status** - Red List status, taken from IUCN (2019); **UK Status** – Conservation status in the UK; PS – Priority Species, SoCC – Species of Conservation Concern. **Protection** – EU – Listed on an EU Habitats Directive [92/43/EEC] Annex, RoI – Listed on the Wildlife Act, 1976 or Wildlife (Amendment) Act, 2000, NI – Listed on the Wildlife (N.I.) Order of 1985.

Scientific name	Category	Common name	IRL 2019 Status	IRL 2009 Status	EU Status	Global Status	UK Status	Protection
<i>Erinaceus europaeus</i>	Native/naturalised	Hedgehog	LC	LC	LC	LC	PS	RoI; NI
<i>Sorex minutus</i>	Native/naturalised	Pygmy shrew	LC	LC	LC	LC		RoI; NI
<i>Crocidura russula</i>	Post-1500	Greater white-toothed shrew	NA	NA	LC	LC		None
<i>Myotis daubentonii</i>	Native/naturalised	Daubenton's bat	LC	LC	LC	LC	SoCC	EU; RoI; NI
<i>Myotis mystacinus</i>	Native/naturalised	Whiskered bat	LC	LC	LC	LC	SoCC	EU; RoI; NI
<i>Myotis nattereri</i>	Native/naturalised	Natterer's bat	LC	LC	LC	LC	SoCC	EU; RoI; NI
<i>Nyctalus leisleri</i>	Native/naturalised	Leisler's bat	LC	NT	LC	LC	SoCC	EU; RoI; NI
<i>Pipistrellus nathusii</i>	Native/naturalised	Nathusius' pipistrelle	LC	LC	LC	LC	SoCC	EU; RoI; NI
<i>Pipistrellus pipistrellus</i>	Native/naturalised	Common pipistrelle	LC	LC	LC	LC	SoCC, PS	EU; RoI; NI
<i>Pipistrellus pygmaeus</i>	Native/naturalised	Soprano pipistrelle	LC	LC	LC	LC		EU; RoI; NI
<i>Plecotus auritus</i>	Native/naturalised	Brown long-eared bat	LC	LC	LC	LC	SoCC	EU; RoI; NI
<i>Rhinolophus hipposideros</i>	Native/naturalised	Lesser horseshoe bat	LC	LC	NT	LC	SoCC, PS	EU; RoI
<i>Rhinolophus ferrumequinum</i>	Vagrant	Greater horseshoe bat	NA	NA	NT	LC		EU
<i>Myotis brandtii</i>	Vagrant	Brandt's bat	NA	DD	LC	LC		EU
<i>Apodemus sylvaticus</i>	Native/naturalised	Wood mouse	LC	LC	LC	LC		None
<i>Mus musculus</i>	Native/naturalised	House mouse	LC	LC	LC	LC		None
<i>Myodes glareolus</i>	Post-1500	Bank vole	NA	NA	LC	LC		None
<i>Rattus rattus</i>	Native/naturalised	Black rat	VU (D2)	VU (D2)	LC	LC		None
<i>Rattus norvegicus</i>	Post-1500	Brown rat	NA	NA	NA	LC		None
<i>Muscardinus avellanarius</i>	Post-1500	Hazel dormouse	NA	NA	LC	LC		None
<i>Myocastor coypus</i>	Post-1500	Coypu	NA	NA	NA	LC		None
<i>Sciurus carolinensis</i>	Post-1500	Grey squirrel	NA	NA	NA	LC		None
<i>Sciurus vulgaris</i>	Native/naturalised	Red squirrel	LC	NT	LC	LC	PS	RoI; NI
<i>Canis lupus</i>	Native/naturalised	Grey wolf	RE	RE	LC	LC		None
<i>Lutra lutra</i>	Native/naturalised	Otter	LC	NT	NT	NT	SoCC, PS	EU; RoI; NI
<i>Martes martes</i>	Native/naturalised	Pine marten	LC	LC	LC	LC	SoCC, PS	EU; RoI; NI
<i>Meles meles</i>	Native/naturalised	Badger	LC	LC	LC	LC	SoCC	EU; RoI; NI
<i>Mustela erminea hibernica</i>	Native/naturalised	Irish stoat	LC	LC	LC	LC [ <i>M. erminea</i> ]		RoI; NI
<i>Neovison vison</i>	Post-1500	American mink	NA	NA	NA	LC		None

<i>Mustela putorius furo</i>	Feral	Feral ferret	NA	NA	NA	NA		None
<i>Vulpes vulpes</i>	Native/naturalised	Red fox	LC	LC	LC	LC		None
<i>Halichoerus grypus</i>	Native/naturalised	Grey seal	LC	NA	LC	LC		EU; RoI; NI
<i>Phoca vitulina</i>	Native/naturalised	Harbour seal	LC	NA	LC	LC		EU; RoI; NI
<i>Lepus europaeus</i>	Post-1500	Brown hare	NA	NA	LC	LC	SoCC, PS	NI
<i>Lepus timidus hibernicus</i>	Native/naturalised	Irish hare	LC	LC	LC	LC [ <i>L. timidus</i> ]	PS	EU; RoI; NI
<i>Oryctolagus cuniculus</i>	Native/naturalised	Rabbit	LC	LC	NT	LC		None
<i>Cervus elaphus</i>	Native/naturalised	Red deer	LC	LC	LC	LC		RoI; NI
<i>Cervus nippon</i>	Post-1500	Sika deer	NA	NA	NA	LC		RoI; NI
<i>Dama dama</i>	Native/naturalised	Fallow deer	LC	LC	LC	LC	SoCC	RoI; NI
<i>Muntiacus reevesi</i>	Post-1500	Muntjac deer	NA	NA	NA	LC		None
<i>Capra hircus</i>	Feral	Feral goat	NA	NA	NA	NA		None
<i>Sus scrofa</i>	Post-1500	Wild boar	NA	NA	LC	LC		None
<i>Macropus rufogriseus</i>	Post-1500	Red-necked wallaby	NA	NA	NA	LC		None