Ireland

Red List No. 1

THE IUCN RED LIST
OF THREATENED SPECIES™

Water beetles

Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government

Northern Ireland
Environment
Agency
www.ni-environment.gov.uk

Ireland Red List No. 1:

Water beetles

G.N. Foster[1], B.H. Nelson[2] & Á. O Connor[3]

[1] 3 Eglinton Terrace, Ayr KA7 1JJ

[2] Department of Natural Sciences, National Museums Northern Ireland

[3] National Parks & Wildlife Service, Department of Environment, Heritage & Local Government

Citation:

Foster, G. N., Nelson, B. H. & O Connor, Á. (2009) *Ireland Red List No. 1 – Water beetles.* National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Cover images from top: *Dryops similaris* (© Roy Anderson); *Gyrinus urinator, Hygrotus decoratus, Berosus signaticollis* & *Platambus maculatus* (all © Jonty Denton)

Ireland Red List Series Editors: N. Kingston & F. Marnell

ISSN 2009-2016

CONTENTS

ACKNOWLEDGEMENTS

We are grateful to those who attended one or more of the meetings convened on 26 January and 5 December 2006 and 4 December 2007 to discuss Red List statuses: Roy Anderson, Úna Fitzpatrick, Naomi Kingston, Ferdia Marnell, Stephen McCormack, Damian McFerran, Eoin O'Callaghan, Gwendolin Porst, Eugenie Regan, and Richard Weyl.

We are also grateful to Damian for cooperation in releasing records from the CEDaR database. We wish to acknowledge Alan Morton's help with DMAP for Windows version 7.2e, and to note the invaluable help of fellow recorders among whom we would specifically mention Roy Anderson, David Bilton, Bob Merritt, Stephen McCormack, and Julian Reynolds.

Thanks to Naomi, from the National Parks and Wildlife Service, for formatting and editing this manuscript. Many thanks to Ferdia, also from the National Parks and Wildlife Service, for his support throughout the project.

Mike Morris provided invaluable information on the Bagoinae. Jan Cuppen checked some Irish *Chaetarthria*. GNF, BHN, and Stephen McCormack, were also able to check material in national collections through access and loans provided by Jim O'Connor (National Museum of Ireland, Dublin). Max Barclay and Roger Booth (Natural History Museum, London), Graham Rotheray (Royal Scottish Museum, Edinburgh), Robert Nash (Ulster Museum, Belfast), Darren Mann (Oxford University Museum of Natural History), William Foster (University Museum of Zoology Cambridge), Geoff Hancock (Hunterian Museum, University of Glasgow), Guy Knight (World Museum, Liverpool), and Dmitri Logunov (Manchester Museum) also provided access to museum material. John Davy-Bowker (Centre for Ecology and Hydrology) downloaded some RIVPACS survey data for us.

Lastly, we would like to record our gratitude to all those who have contributed records to the recording scheme over almost thirty years, in addition to those named above: Keith Alexander, Tina Aughney, Chris Barry, Gustavo Becerra Jurado, Arno van Berge Henegouwen, Stephen Bradish, John Bratton, Sheila Brooke, Alastair Cameron, Martin Cawley, Daniel Downes, Roderick Dunn, Mick Eyre, Sharon Fahy, Triona Finnen, Stefanie Fleischer, Aileen Foster, Andy Foster, Laurie Friday, Stefan Geisen, Margherita Gioria, Jervis Good, Ton van Haaren, Michael Hackett, Edel Hannigan, Simon Harrison, the late Brenda Healy, Peter Hodge, Jane Kavanagh, Ierse Kevers, Roger Key, Giles King-Salter, Peter Langton, Ivor Lansbury, Derek Lott, Paul Lysaght, Donncha Madden, Kieran McCarthy, Claire Moore, Rosemary Moore, Evelyn Moorkens, James Moran, Michelle Moran, Matt Murphy, André van Nieuwenhuyzen, Margaret Norton, Eimear O'Connor, Brian O'Hanrahan, Norma O'Hea, Geoff Oliver, Marcin Penk, Chris Peppiatt, Philippe Ponel, Chris Reid, Ignacio Ribera, Chris Scotter, Matt Smith, Arja Span, Martin Speight, Patrick Sweeney, Deirdre Tierney, Mark Telfer, Kathryn Turner, Fergal Waldron, John Walsh, Colin Welch, Lauren Williams, John Wright, and Mark Young – with apologies to anyone who may have been overlooked.

EXECUTIVE SUMMARY

Based on ca 37,000 records for Ireland, 244 taxa of beetle are evaluated for their conservation status using the International Union for the Conservation of Nature (IUCN) regional criteria. Of the wetland species, eight are considered to be regionally extinct, eight critically endangered, eleven endangered, twenty two vulnerable, twenty four near threatened, and the rest at lower risk, of least concern or data-deficient. Ninety-three taxa are mapped. The importance of halting losses in brackish and running waters is identified, together with the risks to montane species associated with climate change. However, the international importance of Ireland is recognised in sustaining viable populations of many fen and lake species that are otherwise under threat in Europe.

INTRODUCTION

The International Union for the Conservation of Nature (IUCN) revised its categories and criteria for Red List species in 2001 (IUCN 2001), and in 2003 produced guidelines for using the categories on a regional basis (IUCN 2003) (See Appendix 1). Water beetles, whilst not being the most charismatic of insects, have attracted considerable interest in Ireland both in the early 20th Century, when Professor Balfour-Browne initiated a recording scheme, and from the 1980's onwards. The availability of a database spanning well over a century has made it possible to evaluate decline in order to identify species at risk of extinction in Ireland.

NOMENCLATURE AND THE IRISH CHECKLIST

The checklist (Table 5 in Appendix 2) follows the sequence in Anderson, Nash and O'Connor (1997), where necessary modified according to changes indicated by Foster (2004, 2005). It also includes four species since added to the Irish list: *Agabus melanarius*, *Platambus maculatus*, *Ochthebius nilssoni* and *Elodes pseudominuta*. *Limnebius aluta* (Bedel), *Ochthebius nanus* Stephens, *Helophorus rufipes* (Bosc d'Antic), *Laccobius sinuatus* Motschulsky and *Scirtes orbicularis* (Panzer) are not considered to be Irish. Terrestrial Sphaeridiinae are included for the sake of completeness. The treatment of reed beetles, Donaciinae, follows Nelson, Walsh and Foster (2007). The names of plants follow Stace (1997).

COVERAGE

The current database stands at ca 37,000 records. Coverage varies among groups for several reasons:

- species vary in the ease with which they are caught by sweep-netting water,
- some have short seasons as adults, normally the only stage that can be used to generate reliable record; others can be found as adults through most of the year,
- Professor Balfour-Browne, who ran a mapping scheme based on vice-counties for over fifty years, recorded only Hydradephaga, Hydraenidae and truly aquatic Hydrophiloidea. He ignored several groups, e.g. Sphaeridiinae, Donaciinae, resulting in a shortage of records and collations,
- when cryptic species pairs are exposed older records are invalidated until there has been an opportunity to review historical material, the most recent example being *Chaetarthria seminulum* and *C. simillima*, both of which have been identified from Ireland.

Although the water beetle recording scheme is based on an ecological grouping, amphibious Carabidae and Staphylinidae are not covered. The recording scheme does include Sphaeridiinae, even those confined to dung, in the interests of having coverage of all Hydrophiloidea, but only those sphaeridiines regularly occurring in water were evaluated for red list status.

When the first meeting of the Red List group was held in January 2006, 19,000 records were available on the main database, coupled with information obtained separately from the CEDaR

database. By the time of the meeting on 4 December 2007, 32,000 records were available in a single database, not just new field data but also data extracted from CEDaR and Professor Balfour-Browne's card indices and diaries. A further 5,000 records have been added in 2008.

Regionally, coverage is good (Figure 1), but with some distinct gaps that might yet yield good quality sites.

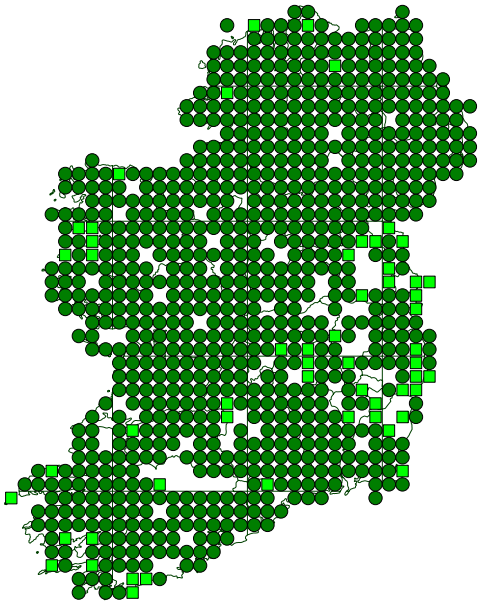


Figure 1 Distribution of records in the water beetle recording scheme, dark circles representing records from 1980 onwards, superimposed, where necessary, on older records indicated by paler squares

About 7,700 records are for up to and including 1979, the rest (ca 29,000) being for the past 28 years, from 1980 onwards. Early records are concentrated in one period associated with Balfour-Browne's activity when resident near Belfast. The recent bigger peak hopefully indicates an exponential development of interest (Figure 2).

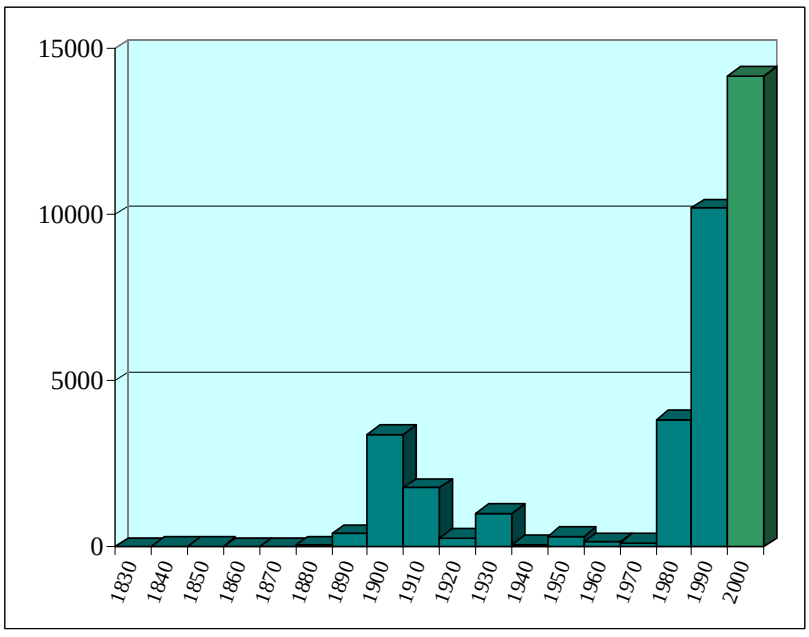


Figure 2 Distribution of records by decade, the last period being less than a decade

SUMMARY OF EVALUATIONS

The statuses of 244 wetland taxa were evaluated for potential Red List status using the numbers of 10km squares occupied (Table 5 in Appendix 2): 10 species of whirligig beetles (Gyrinidae); 13 crawling water beetles (Haliplidae); 2 burrowing water beetles (Noteridae); 1 squeak beetle (Hygrobiidae); 88 diving beetles (Dytiscidae); 72 species of water scavenger or mud beetles in the Hydraenidae (22 species) and Hydrophiloidea (13 Helophoridae; 1 Georissidae; 3 Hydrochidae; 33 Hydrophilidae); 18 marsh beetles (Scirtidae); 4 riffle beetles (Elmidae); 3 long-clawed beetles (Dryopidae); 5 Heteroceridae; 20 Donaciinae (Chrysomelidae - reed beetles); and 8 Bagoinae (Curculionidae – sloth weevils). Two terrestrial species of *Helophorus* were not evaluated because they are not sought during water beetle surveys, nor were some terrestrial Sphaeridiinae.

None of these species is listed on a Global Red List, nor do any have a conservation status under either European Community legislation or the Bern Convention. It is not possible to evaluate the contribution of any species to the global population of that species, with the possible exception of *Ochthebius nilssoni* Hebauer, where Ireland has the majority of known sites.

Species considered to be Critically Endangered or Endangered (Table 1) were largely evaluated on the basis of criterion B2 (Table 2), a restricted or fragmented geographic range associated with decline (See Appendix 1). The choice of species considered to be Vulnerable species (Table 2) was largely based on criterion D2, a very small or restricted population based on an area of occupancy of less than 20 km². Criteria A1, C, D1 and E were not used because they are largely based on population counts, which are neither available nor relevant for water beetles.

Species meeting IUCN categories of threat or near threatened were summarised on the basis of their main habitat affinities (Table 3). Nearly as many fen and peat species are considered at risk as are in the other habitat categories combined. The highest proportion of species under threat was associated with brackish waters and the lowest with fen habitats, as can be seen in Figure 3 (in which the poorly represented montane and woodland categories have been added to those for fen and open water habitats respectively). However the fen category includes species associated with turloughs, the "moss edge community" (Bilton 1988, Sheehy Skeffington, Moran, O'Connor, Regan, Coxon, Scott and Gormally 2006): those species largely confined to turloughs have a threat or risk status (*Graptodytes bilineatus* (NT), *Agabus labiatus* (NT), *Helophorus nanus* (VU), *Berosus signaticollis* (EN), and *Dryops similaris* (NT)). Other species associated with the fen community are *Hydroporus scalesianus* and *Laccornis oblongus*, each of which has subsequently been found to be more frequent in Ireland than in Britain, presumably because of the abundance of fenland habitats, both natural and in cutover bogs. Species of temporary grassland pools not in the turlough area, *Helophorus granularis* (EN) and *H. strigifrons* (VU), are also identified as at risk.

Table 1: Lists of species evaluated as regionally extinct or under threat of regional extinction

Regionally Extinct (RE)	
Bidessus minutissimus (Germar)	*Hydrochus angustatus* Germar
Hydraena pulchella Germar	*Plateumaris rustica* (Kunze)
Hydraena pygmaea Waterhouse	*Donacia semicuprea* Panzer
Helophorus alternans Gené	*Bagous glabrirostris* (Herbst)
Critically Endangered (CR)	
Hygrotus decoratus (Gyllenhal)	*Bagous alismatis* (Marsham)
Hydraena minutissima Stephens	*Bagous brevis* Gyllenhal
Berosus luridus (L.)	*Bagous limosus* (Gyllenhal)
Plateumaris bracata (Scopoli)	*Bagous lutulentus* (Gyllenhal)
Endangered (EN)	
Haliplus apicalis Thomson	*Limnebius nitidus* (Marsham)
Hydroporus glabriusculus Aubé	*Helophorus arvernicus* Mulsant
Hydroporus longicornis Sharp	*Helophorus granularis* (L.)
Agabus conspersus (Marsham)	*Berosus signaticollis* (Charpentier)
Hydraena rufipes Curtis	*Hydrocyphon deflexicollis* (Müller)
Enicocerus exsculptus (Germar)	
Vulnerable (VU)	
Haliplus variegatus Sturm	*Ochthebius nilssoni* Hebauer
Hygrotus novemlineatus (Stephens)	*Helophorus fulgidicollis* Motschulsky
Hygrotus versicolor (Schaller)	*Helophorus nanus* Sturm
Laccophilus hyalinus (De Geer)	*Helophorus strigifrons* Thomson
Hydroporus morio Aubé	*Hydrochus brevis* (Herbst)
Agabus congener (Thunberg)	*Enochrus halophilus* (Bedel)
Ilybius chalconatus (Panzer)	*Cyphon kongsbergensis* Munster
Ilybius subaeneus Erichson	*Cyphon punctipennis* Sharp
Hydraena nigrita Germar	*Donacia aquatica* (L.)
Hydraena testacea Curtis	*Donacia cinerea* Herbst
Ochthebius bicolon Germar	*Bagous frit* (Herbst)

Table 2: Summary of evaluations and breakdown of main IUCN criteria

		IUCN Criteria				
	No. spp.	A2	A3	B1	B2	D2
Critically Endangered	8	1	0	1	7	0
Endangered	11	1	1	2	11	0
Vulnerable	22	0	4	0	2	16
Near Threatened	24	0	23	0	1	0

Table 3: Species classified according to their IUCN status and their main habitat affinity

	No. spp.	brackish	fen & peat	montane	open	running	woodland
Regionally Extinct	8	1	4			3	
Critically Endangered	8		5		1	2	
Endangered	11	2	2		2	5	
Vulnerable	22	2	9	3	4	3	1
Near Threatened	24	3	13	3	2	3	
least concern	148	5	93		23	25	2

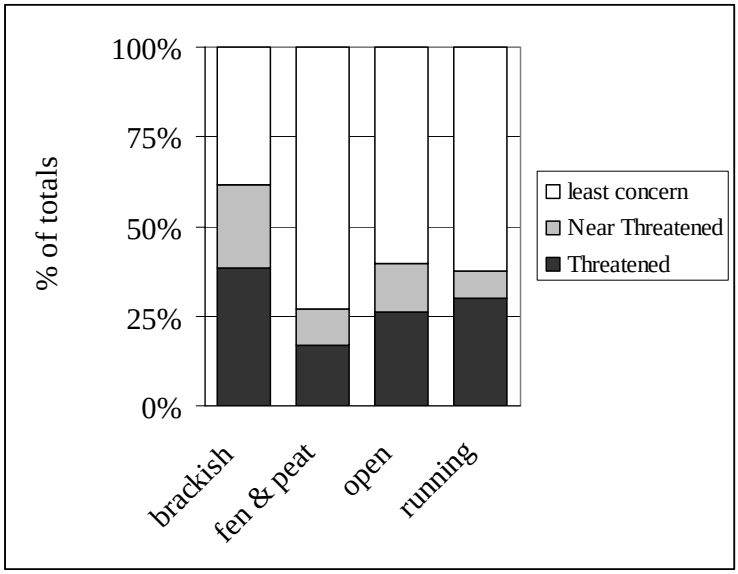


Figure 3: Main habitat affinities of water beetles in relation to degree of threat

The combined distributions (Figure 4) for threat categories provide guidance on where fieldwork might be directed in order to ratify current statuses. The distribution of extinct species is inevitably where collecting was most done in the late 19th and early 20th centuries, along the eastern coast, near major population centres, and in Donegal and Killarney. Features common to the maps of critically endangered and endangered species are Lough Neagh, the interdrumlin fens of Armagh and Down, the Dublin area, Wexford, Killarney, and the Burren. The distribution of vulnerable species follows the intensity of recording activity as a whole.

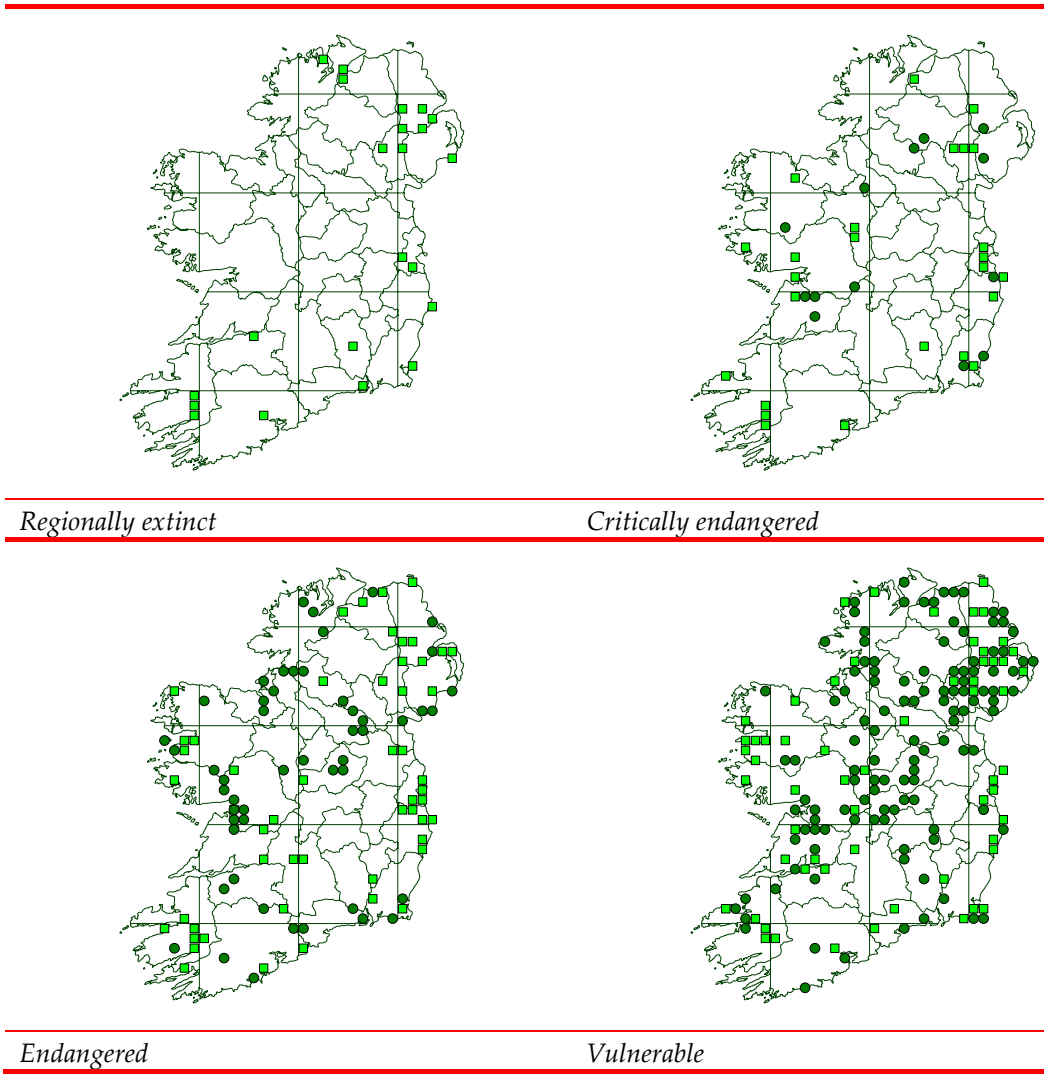


Figure 4: Combined distributions of water beetles according to IUCN threat categories. Dark circles represent records from 1980 onwards, superimposed, where necessary, on older records indicated by paler squares.

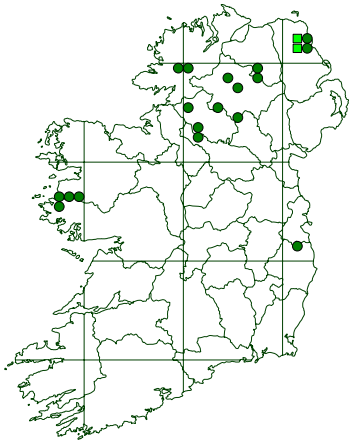
COMMON NAMES

Few water beetles have common names. However, as is often the case in developing Red Lists, each species with risk status has been assigned one. Some of these are jocular, some descriptive and some obscure in origin. Some will find favour and others will be replaced by better ones. *Ochthebius nilssoni* has been given a name in Irish in recognition of Ireland appearing to support its largest population.

THE MAPS

The maps cover 93 taxa in alphabetical order. All RE, CR, EN, and NT species are covered, plus a few species of interest from amongst those data-deficient or evaluated as of least concern.

WATER BEETLE RED LIST



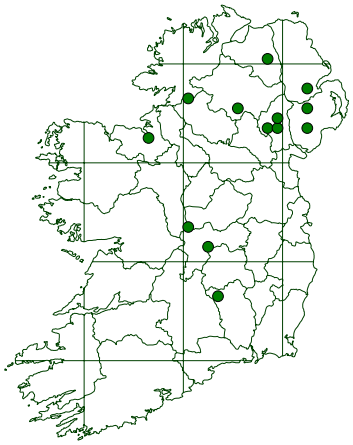
Agabus arcticus

The Arctic Diver

IUCN Near Threatened

A3 c

Found in pools and small lakes in upland heath and blanket bog above 150 m. The rising temperatures associated with climate change could disrupt the development of this largely montane insect. *A. arcticus* is contracting in range elsewhere.



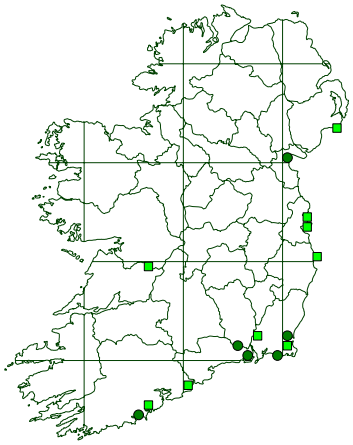
Agabus congener

The Relative Diver

IUCN Vulnerable

A3 c

This is a species associated with small, exposed, acid water bodies. It is surprisingly uncommon in Ireland given the abundance of apparently suitable habitat.



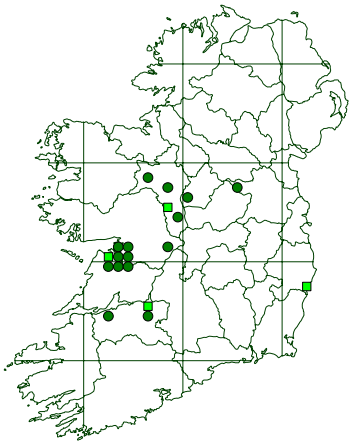
Agabus conspersus

The Spattered Diver

IUCN Endangered

B2 a b iii

The brackish ponds and ditches suitable for this species are declining in number, mainly because of coastal development. The record for R69 is from Lough Atorick, confirmed by Balfour-Browne "465 ft above sea level and far from sea".



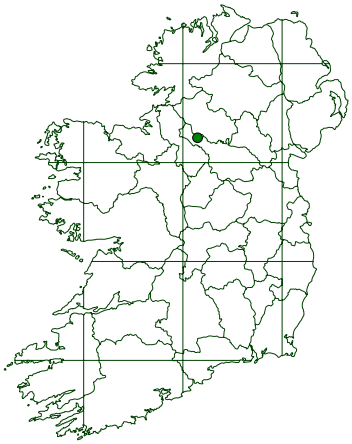
Agabus labiatus

The Lipped Diver

IUCN Near Threatened

A3 c

The stronghold for this species appears to be the turloughs, in keeping with its avoidance of fish.



Agabus melanarius

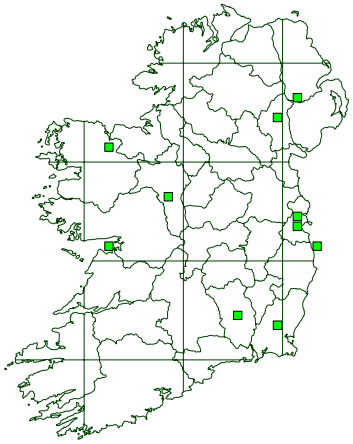
The Wallow Diver

IUCN Data Deficient

A. melanarius was first recorded from Ireland at Lough Atona, Fermanagh in July 2008 by Brian Nelson (Nelson 2008). It occurs in woodland pools, spring-fed pools on hill slopes and small disturbed pools such as deer wallows and flooded vehicle ruts.

Notes on the Bagoinae

The bagoine weevils have been selected from among the amphibious weevils as species of great conservation concern. The case for concern across Europe was explained by Sprick (2000). Study of these weevils is hampered by their cryptic habits, seasonality and difficulty in their identifiication. Despite this, it is clear that they are associated with high quality sites: in Ireland including turloughs and interdrumlin fens; in Britain mainly grazing fen and heathland pools.



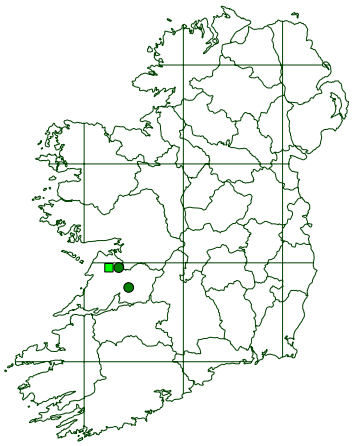
Bagous alismatis

The Water Plantain Sloth Weevil

IUCN Critically Endangered

A2 b c

B. alismatis was widely recorded in the 19th Century, but was last recorded by Morris in 1971. It feeds on water plantain (*Alisma plantago-aquatica* L.).



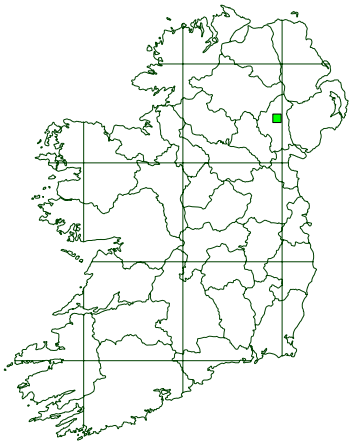
Bagous brevis

The Short Sloth Weevil

IUCN Critically Endangered

B2 a b (iii)

B. brevis is associated with turlough habitats near Mullagh More, found most recently, in 2007, in Lough Gealáin, Clare, by Julian Reynolds. It feeds on lesser spearwort (*Ranunculus flammula* L.) (Cuppen and Heijerman 1995).

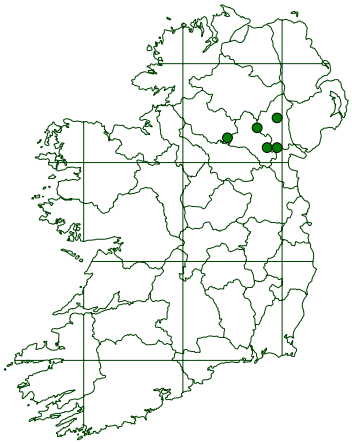


Bagous collignensis

A Sloth Weevil

IUCN Data Deficient

The status of *B. collignensis* in Ireland is uncertain following confirmation of the presence of *B. frit*. The only certain record at present is from Armagh in 1895 (Morris 1985). Published records in Nelson and Anderson (1999) are either indeterminate or have been re-determined as *B. frit*. *B. collignensis* is associated with *Myriophyllum*.



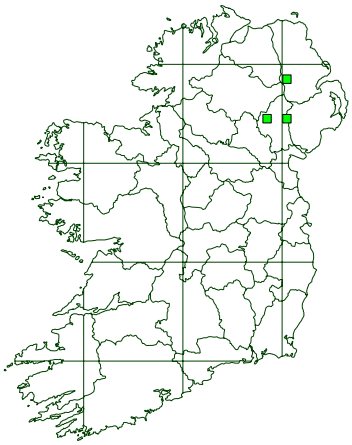
Bagous frit

A Sloth Weevil

IUCN Vulnerable

D2

B. frit appears to be confined to interdrumlin fens. The old Antrim record was originally for *B. collignensis* (Herbst) (and is being checked as most likely to be *B. frit*) and the new ones are for Armagh. Associated with bogbean (*Menyanthes trifoliata* L.).

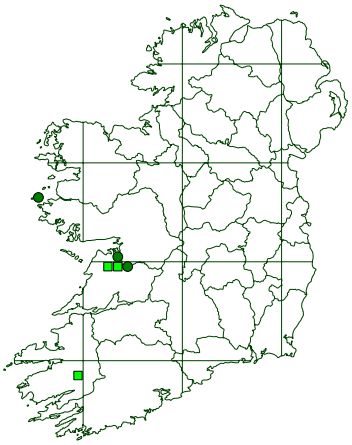


Bagous glabrirostris

The Bald-beaked Sloth Weevil

IUCN Regionally Extinct

B. glabrirostris was recorded with certainty from Armagh by the Reverend W.F. Johnson in 1894 (Morris 1985). Morris (2002) notes that records for Clare and Down require confirmation. It is claimed to be polyphagous, or possibly confined to hornworts (*Ceratophyllum* spp.) and water- soldier (*Stratiotes aloides* L.).



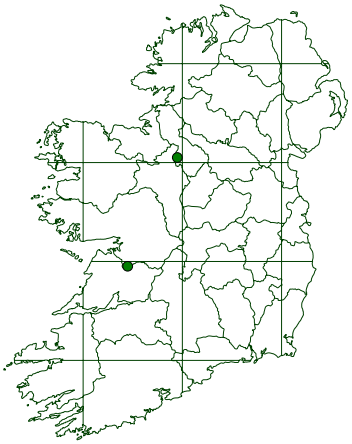
Bagous limosus

The Mud Sloth Weevil

IUCN Critically Endangered

B2 a b (iii)

Old records of *B. limosus* are from Kerry and Clare, and two records in 2003 are from Galway, including Inishbofin. The most recent record is for a Clare turlough. This species is associated with pondweeds (*Potamogeton* spp.).

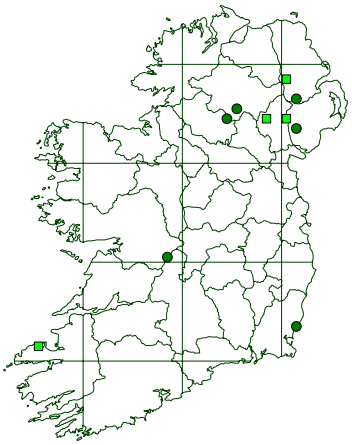


Bagous lutosus

The Miry Sloth Weevil

IUCN Data Deficient

First found in Ireland in Leitrim in 2005 (Nelson 2007). It is known to be associated with *Potamogeton gramineus* L. (Hansen, Jørum, Mahler and Vagtholm-Jensen 1991), not bur-reed (*Sparganium erectum* L.) as has been claimed, and a recent record for Clare is from *P. coloratus* Hornemann (Nelson 2007).



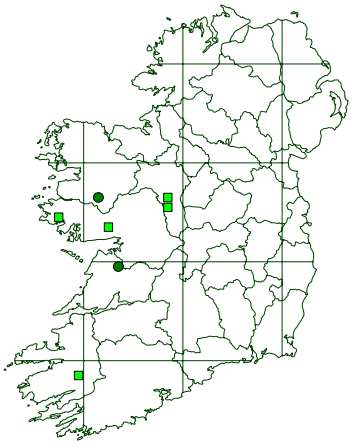
Bagous lutulentus

The Horsetail Sloth Weevil

IUCN Critically Endangered

B2 a b (iii)

B. lutulentus is associated with water horsetail (*Equisetum fluviatile* L.). The main threat is considered to be diffuse pollution affecting the quality of the habitat.



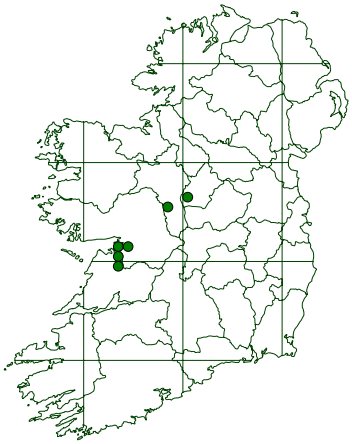
Berosus luridus

The Sallow Scavenger Beetle

IUCN Critically Endangered

B2 a b (iii)

This species is associated with a few primary habitats, most probably because they lack fish. There is evidence of decline elsewhere (extinct in Scotland and Wales, in serious decline in England).



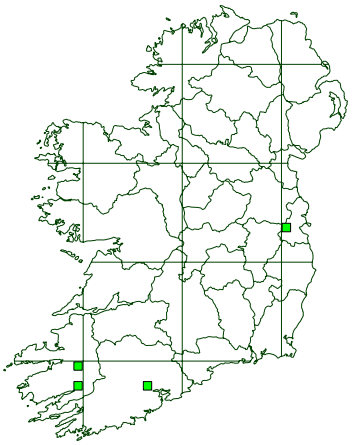
Berosus signaticollis

The Spotted Scavenger Beetle

IUCN Endangered

A3 c, B2 a b (iii)

B. signaticollis, a distinctive species, was not detected until 1986 (Bilton 1988). It would seem that the mossy edges of turloughs, a specialised and fragile habitat, were not surveyed in the past. The most recent records are provided by Bradish, O Connor and Reed (2002).

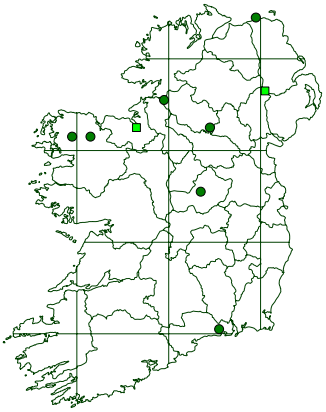


Bidessus minutissimus

The Diminutive Diver

IUCN Regionally Extinct

B. minutissimus was first found in Ireland in the River Lee, Cork, in 1847. It is also known from the Camac in County Dublin, and the River Sheen in Kerry. The last record was for a ballast pit beside the River Flesk near Killarney in 1929. *B. minutissimus* is found in clean shingle in unmodified rivers. It is long since extinct in England, has not been found recently in Scotland or on the Isle of Man, but persists in some Welsh river systems.

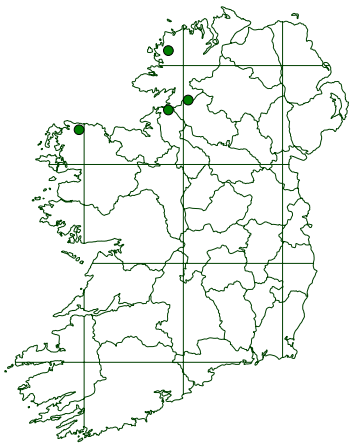


Chaetarthria seminulum

The Chummier Australian

IUCN Data Deficient

Vorst and Cuppen (2003) recognised *C. seminulum* s. str. as distinct from *C. simillima,* the commoner species in Ireland. *C. seminulum* is mainly associated with large loughs such as Neagh, Owel and Melvin.



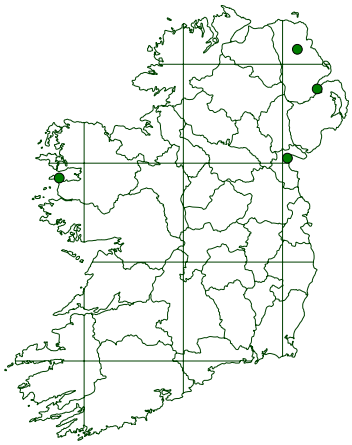
Cyphon kongsbergensis

The Kongsberg Marsh Beetle

IUCN Vulnerable

D2

Originally recorded in 1999 in Mayo (Marnell 2000), and found in Fermanagh, Leitrim and Donegal in 2007 (Foster 2008a), this species is likely to be widespread in the north and west on wet blanket bog and acid lake mires, favouring *Sphagnum* regrowth in peat cuttings.

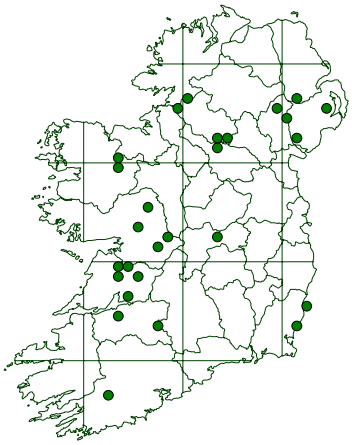


Cyphon palustris

A Marsh Beetle

IUCN Data Deficient

First recorded in 1990 and 1991 from two sites in Antrim, and from Clare Island, Mayo in 2002 and Louth in 2003. *C. palustris* is often found beside running water, usually in company with the similar and more common *C. coarctatus*.

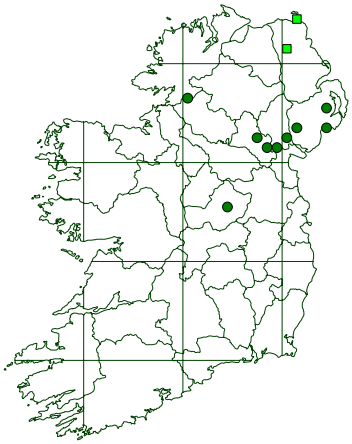


Cyphon pubescens

The Hairy Marsh Beetle

IUCN least concern

Although not detected until 1991, this species occupies good quality fenland, and should be kept under review.



Cyphon punctipennis

The Transition Marsh Beetle

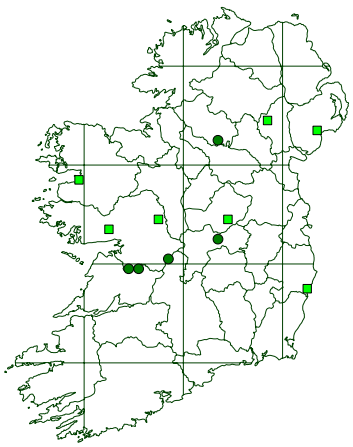
IUCN Vulnerable

A3 c

This species is mainly associated with fens in the process of change to raised bog (McCormack 2006). Such fens are rare in Ireland (Foss, O'Connell and Crushell 2001).

Notes on the *Donacia* spp. Reed Beetles

The reed beetles are a showy group of species, many of which have levels of occurrence higher than in Britain (Nelson, Walsh and Foster 2007). The material for a recent publication (Cox 2007) on Chrysomelidae unfortunately could not take advantage of this critical appraisal of Irish records. The database is here considered to be complete, although it is obvious that recording is generally low, possibly because of the relatively short period of adult activity.



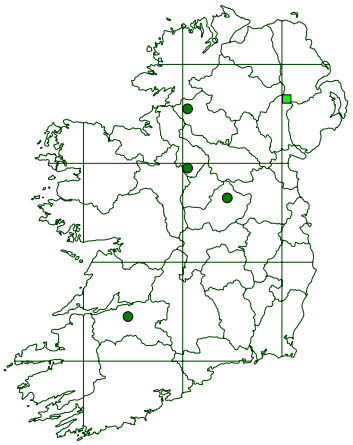
Donacia aquatica

The Zircon Reed Beetle

IUCN Vulnerable

D2

An extensive survey of the status of *D. aquatica* in Britain in 2005 (Foster, Bratton, Ewing, Hodge and Nobes 2007) established that it occurs on bladder sedge (*Carex vesicaria* L.), bottle sedge (*C. rostrata* Stokes), lesser pond sedge (*C. acutiformis* Ehrhardt) and lesser tussock sedge (*C. diandra* Schrank), but not on greater pond-sedge (*C. riparia* L.).



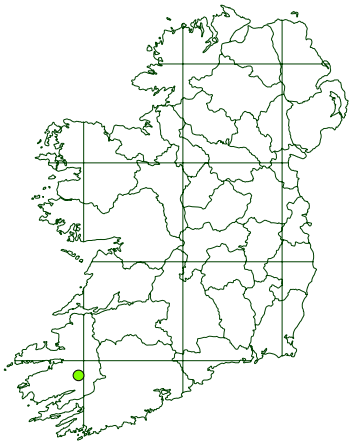
Donacia cinerea

The Hairy Reed Beetle

IUCN Vulnerable

D2

Donacia cinerea has been recorded from Antrim, Leitrim, Limerick and Westmeath, discovered at Ballinafid Lough in the latter vice-county in 1982 (Speight 1986) where it was found again by John Walsh in 2000. Roy Anderson found it in 2008 in Doagh Lough, Fermanagh.

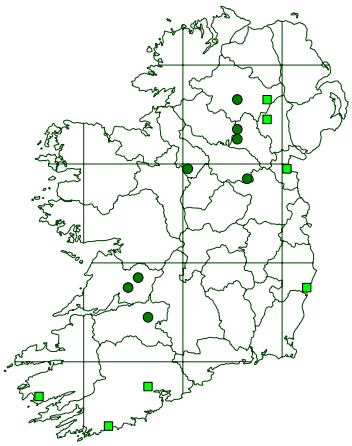


Donacia dentata

The Toothed Reed Beetle

IUCN Data Deficient

There is only one potential record for Ireland, based on material in the National Museum of Ireland, Dublin, supposedly taken by H. Gore Cuthbert on white water lily (*Nymphaea alba* L.) in 1898 at Lough Crincaum, South Kerry. The usual host plant is arrowhead (*Sagittaria sagittifolia* L.) but water plantain (*Alisma plantago-aquatica* L.) is another host plant more likely to be found in the area. This record is considered unlikely by Nelson, Walsh and Foster (2007). An Armagh record, repeated in Cox (2007), was corrected to *D. versicolorea* (Brahm) by Johnson and Halbert (1902). Lough Crincaum (inset) was visited in July 2008 by Lauren Williams, who reported some *Phragmites* and *Nymphaea alba*.



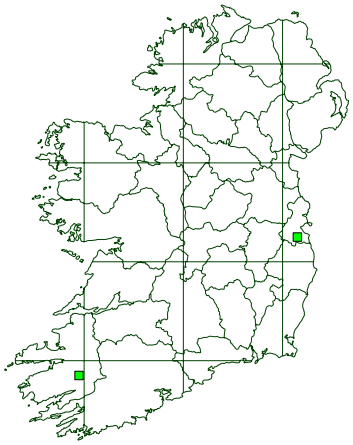
Donacia marginata

A Reed Beetle

IUCN Near Threatened

A3 c

D. marginata is one of the less common reed beetles and is associated with unbranched bur-reed (*Sparganium erectum* L.). It appears to be confined to stagnant water, unlike the more common *D. bicolora* Zschach.

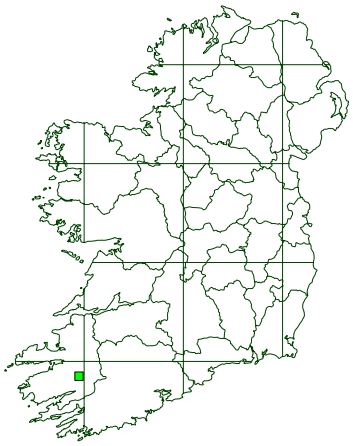


Donacia semicuprea

The Halfpenny Reed Beetle

IUCN Regionally Extinct

Vouchers exist for South Kerry (just as for *D. dentata* and *Plateumaris bracata*) and for Dundrum, Dublin. Disconcertingly, the host plant, reed sweet-grass *Glyceria maxima* L., is absent from Kerry (Nelson, Walsh and Foster 2007). Unlike the record for *Donacia dentata*, the Kerry record for this species is accepted given the availability of specimens from another site. The maps of Menzies and Cox (1996) and Cox (2007) wrongly show the old Armagh record and a more recent record based on *D. versicolorea* (Brahm).

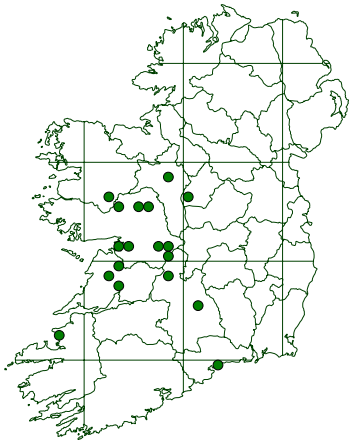


Donacia sparganii

A Reed Beetle

IUCN Data Deficient

Four examples labelled as from Killarney and collected by Edwin Bullock are in Liverpool Museum (Nelson, Walsh and Foster 2007). The material is undated. This species feeds on bur-reeds, often in deep running water.



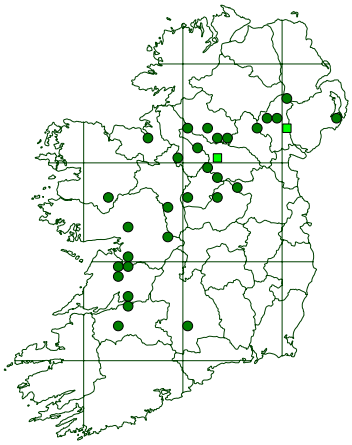
Dryops similaris

The Turlough Long-Claw

IUCN Near Threatened

A3 c

This is a member of the moss edge community associated with turloughs, and it was first discovered in Ireland in 1986 (Bilton 1988). It is also found in a few coastal pools, of which Lough Akeragh, Kerry, has been damaged by drainage.



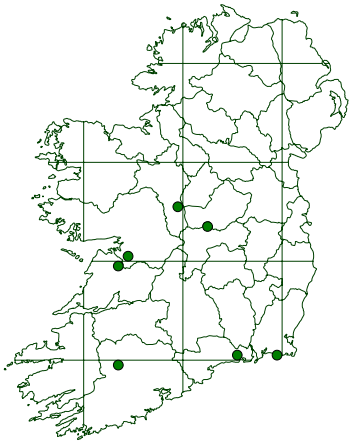
Dytiscus circumcinctus

The Ring-eyed Great Diving Beetle

IUCN Near Threatened

A3 c

This great diving beetle is mainly associated with rich lake fens in central Ireland. Likely threats include eutrophication and the introduction of fish. This species has been lost from large areas of fenland in southern England.

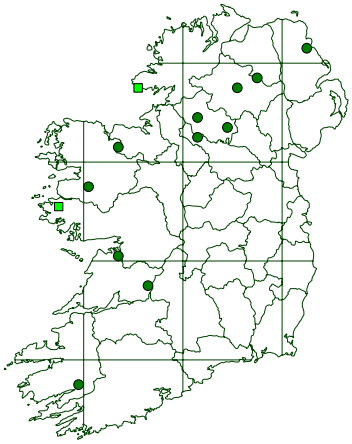


Dytiscus circumflexus

A Great Diving Beetle

IUCN least concern

This great diving beetle is expanding its range in Ireland, having originally been found twice in 1983, including in a house in Wexford (O'Connor and O'Neill 1985). The most recent published record is from Waterford (Becerra Jurado, Johnson and Kelly-Quinn 2007). When the population of *D. circumflexus* recently expanded in England, it became more associated with lowland ponds and ditches rather than exclusively with brackish water as in the past. It seems that the Irish population is also spread across freshwater lowland habitats.



Dytiscus lapponicus

The Highland Great Diving Beetle

IUCN Near Threatened

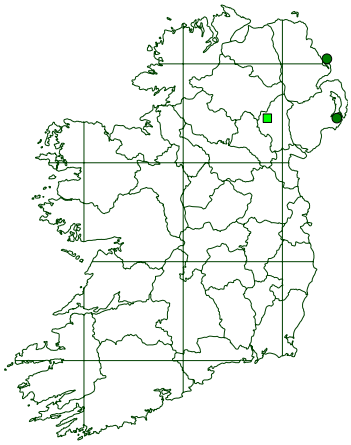
A3 c

This is another largely montane species likely to be affected adversely by climate change. It is typically found in peaty montane lakes and ponds. Also in more low-lying bogs down to 200m.

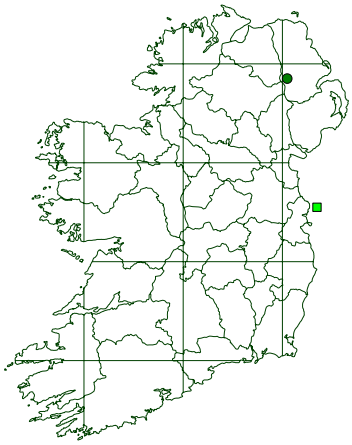
Notes on the *Elodes* spp.

Species in this genus are under-recorded with a fleeting adult phase, identifiable only in males, and yet collectively include some of the commonest water beetles! The names are quite possibly confused, particularly because of uncertainty about use of the name *elongata* Tournier. The *E. minuta* record is from Lambay Island. Most records in the database are old. All these species are evaluated as **Data Deficient**. *E. marginata* is now in the genus *Odeles* and it is considered to be of **least concern**. *E. pseudominuta* has yet to be formally brought forward as an Irish species.

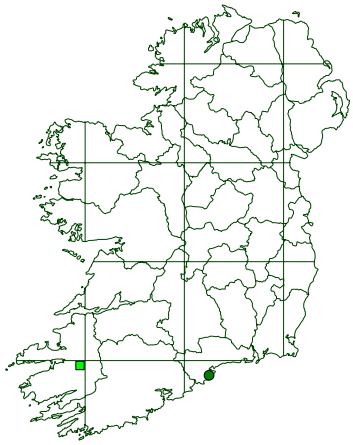
Elodes elongata

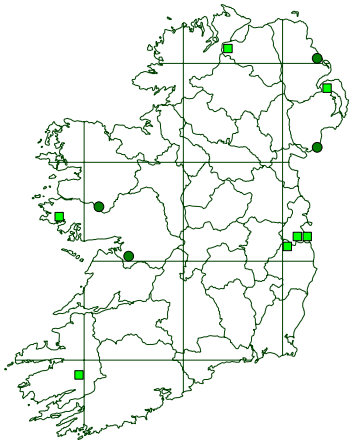


Elodes minuta



Elodes pseudominuta





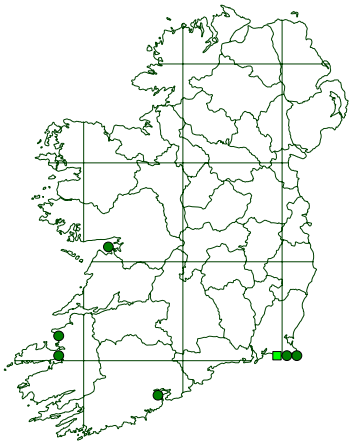
Enicocerus exsculptus

The Sculptured Moss Beetle

IUCN Endangered

B2 a b (i-iv)

This is normally a species of fast streams, often in association with tufa concretions or moss. Two of four recent Irish records are for the shorelines of calcareous lakes. This species is sometimes referred to the genus *Ochthebius*.



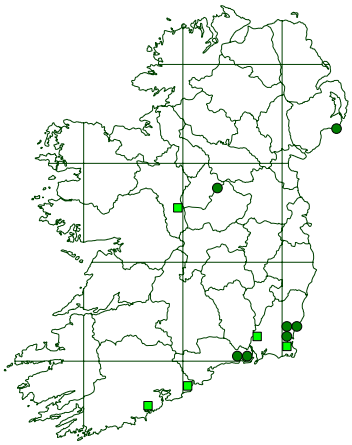
Enochrus halophilus

The Salty Scavenger Beetle

IUCN Vulnerable

D2

This is one of the rare brackish water species in Ireland. It is considered to be at risk because the habitat is so limited, even though modern records have extended its known range in southern Ireland.



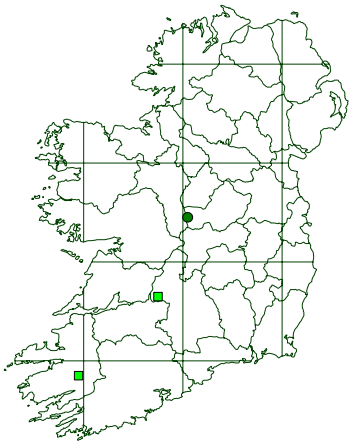
Enochrus melanocephalus

The Blackheaded Scavenger Beetle

IUCN Near Threatened

B2 a b (i, ii , iv)

Records indicate a decline despite this species expanding its range elsewhere, having recently reached Scotland. The habitat, often man-made, muddy ponds, is not endangered.

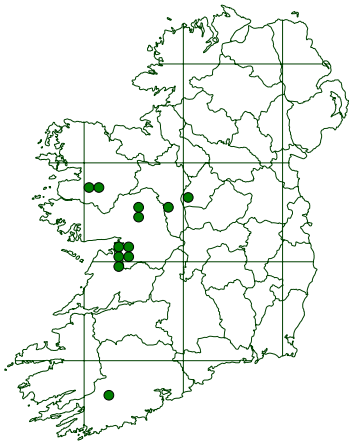


Georissus crenulatus

The Mudslinger

IUCN Data Deficient

This is a cryptic species of damp silt, usually beside running water. It is so easily overlooked that it cannot be assigned a risk category, but it would certainly be amongst the species affected by diffuse pollution.



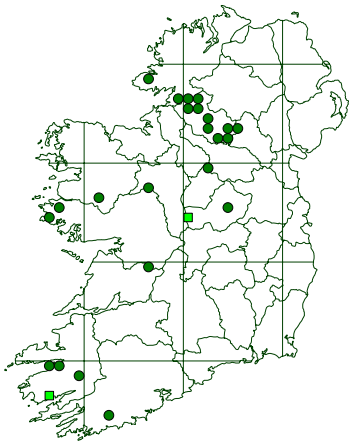
Graptodytes bilineatus

The Two-lined Diver

IUCN Near Threatened

B2 b (iii)

G. bilineatus was discovered in turloughs in 1986 (Bilton 1988), also later in a mountain lake, as a member of the moss edge community (Foster, Nelson, Bilton, Lott, Merritt, Weyl and Eyre 1992). It is more usually associated with coastal reedbeds in the rest of Europe, where it is generally considered to be under threat.



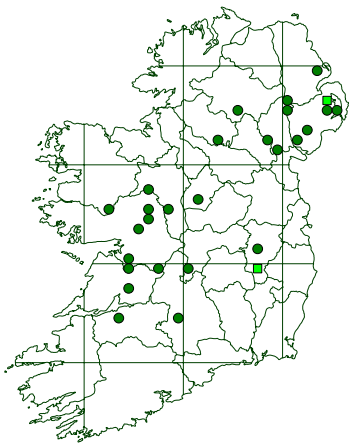
Gyrinus distinctus

The Distinguished Whirligig

IUCN Near Threatened

A3 c

This whirligig is mainly associated with Upper Lough Erne, but it is found in other, mainly western, loughs. It is similarly restricted in Scotland but has colonised some post-industrial sites in England. Enrichment of a few lough systems could have a major impact on this species.



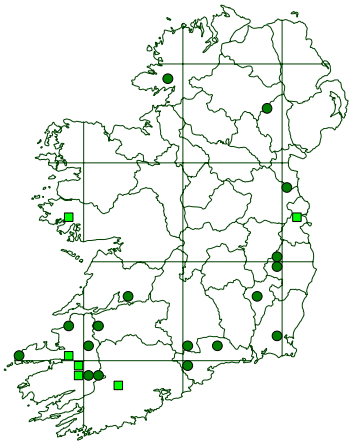
Gyrinus natator

The Shady Whirligig

IUCN Near Threatened

A3 c

The true *G. natator*, not to be confused with the common *G. substriatus* Stephens, is typical of cutover bog and other shaded bog pools. There is evidence of substantial loss of range elsewhere in Europe, resulting in its status being raised from least concern in Ireland.



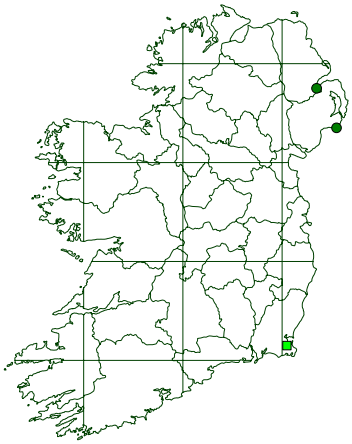
Gyrinus urinator

The Artist

IUCN Near Threatened

A3 c

This species is largely restricted to lowland, base-rich rivers and streams. Its status could well improve in response to climate change but it should be kept under review.



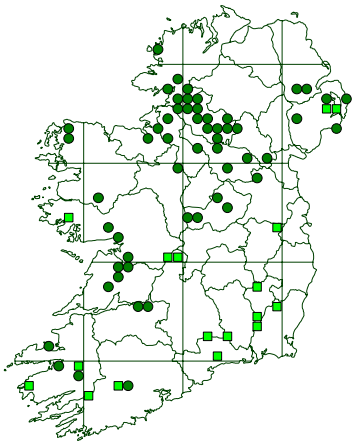
Haliplus apicalis

The Saltmarsh Crawler Water Beetle

IUCN Endangered

B2 a b (i, iii)

Apart from the extinct *Helophorus alternans*, this is the brackish water species most threatened in Ireland. It is rarely found in saltmarsh as such, being mainly a species of coastal lagoons and ditches.



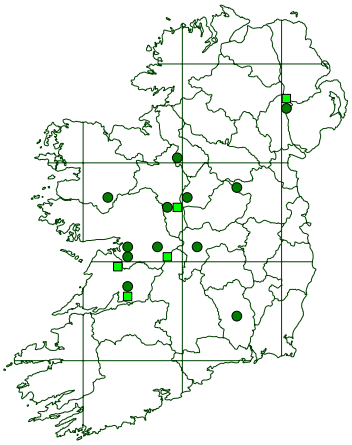
Haliplus lineolatus

The Hydravore

IUCN Near Threatened

A3 c

This is a frequent species from Kerry to Ulster, in particular in the Lough Erne complex, but it appears to have been lost from the south-east of Ireland, an area where diffuse pollution may have caused a problem. This species browses on hydrozoans and sponges in lakes and canals.



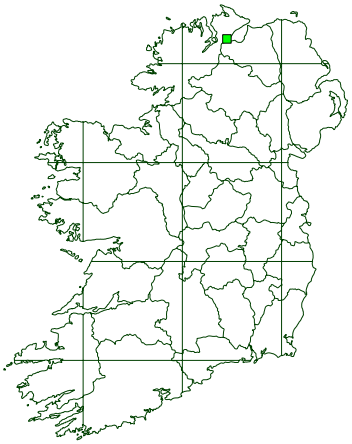
Haliplus variegatus

The Variegated Crawler Water Beetle

IUCN Vulnerable

B2 a b (iii)

A species of fen and cutover bogs. It is also found in some pools on limestone. This species appears to be faring better in Ireland than other parts of Europe, possibly because of the amount of cutover bog.

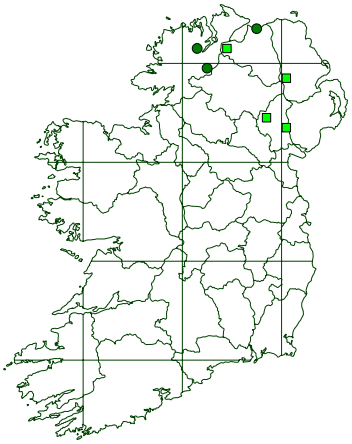


Helophorus alternans

The Ridge and Furrow

IUCN Regionally Extinct

This species was found in numbers at Culmore in 1899, a site lying in Northern Ireland but within the recording vice-county of East Donegal. Balfour-Browne (1951) noted that only a single specimen was found, but Stelfox (1951) corrected this on the basis of the several specimens in the National Museum of Ireland, Dublin. There is another isolated record, from Scotland, suggesting that specimens occasionally fly from the north Welsh coast. The brackish water fauna is recognised as being at risk, with this the only species considered to be extinct from this group.



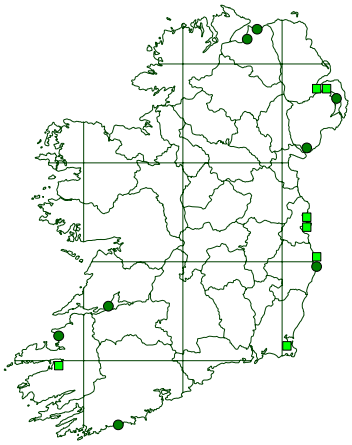
Helophorus arvernicus

The Upland Frenchman

IUCN Endangered

B2 a b (ii, iii)

This is a species of clean silt in rivers and streams known only from Ulster.



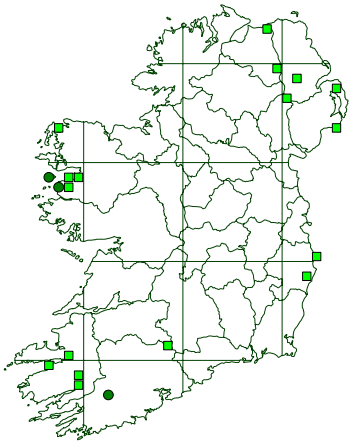
Helophorus fulgidicollis

The Orangeman

IUCN Vulnerable

D2

This is a species typically associated with large tracts of brackish water.



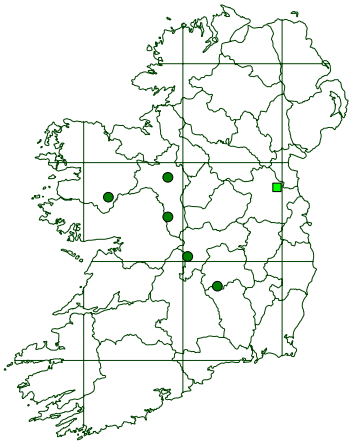
Helophorus granularis

Little Nobby

IUCN Endangered

A2 b c, B2 b (i-iv)

A species of exposed grassy pools flooded in the spring, habitats that are easily drained during pasture improvement and river realignment.



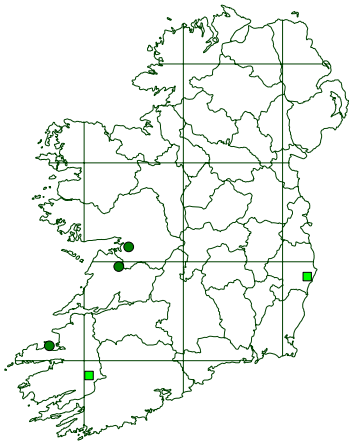
Helophorus nanus

The Dwarf

IUCN Vulnerable

D2

This is a mobile member of the moss edge community, possibly overlooked, but often indicative of high quality fen habitats.



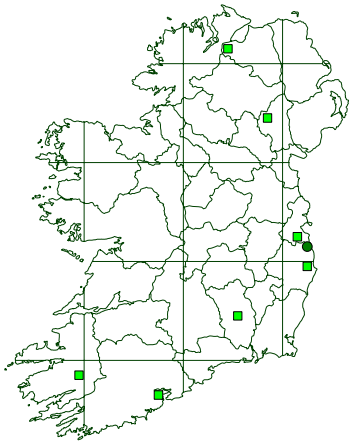
Helophorus strigifrons

The Wrinkled Brow

IUCN Vulnerable

D2

This species is associated with temporary swamps, an easily drained habitat. It appears to be much less common in Ireland than in Scotland.



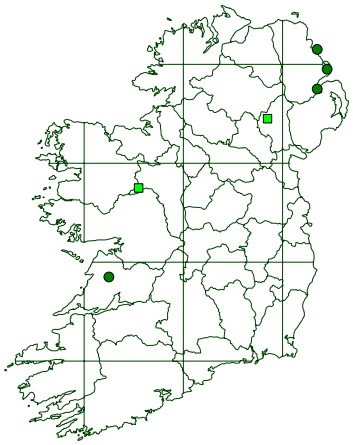
Hydraena minutissima

The Diminutive Moss Beetle

IUCN Critically Endangered

B2 a b (i-iv)

This is a species of rocky streams and river sills, rediscovered in 1999 (Tierney, Bradley, Kelly-Quinn and Murray 2002).



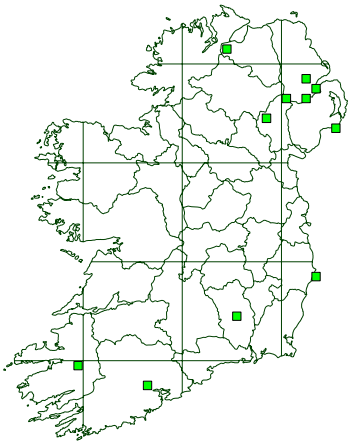
Hydraena nigrita

The Black Moss Beetle

IUCN Vulnerable

D2

A species typical of shaded streams, with detritus mixed into silt, a habitat rare in Ireland.

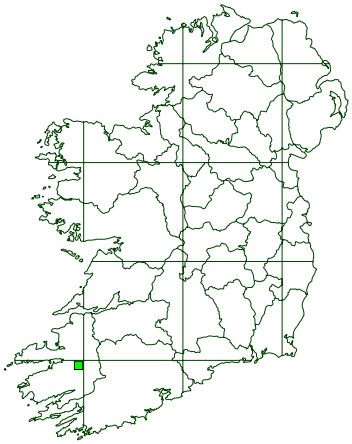


Hydraena pulchella

The Beautiful Moss Beetle

IUCN Regionally Extinct

The last record for this hydraenid was in 1930 near Killarney. This was once a widespread species found in slowly lapping water over clean silt in river edges.

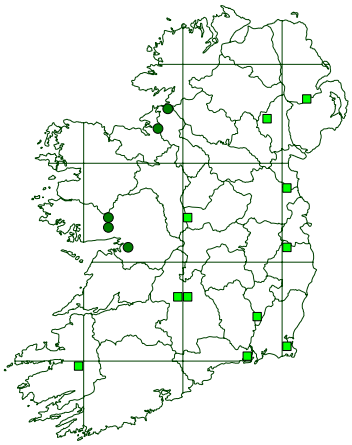


Hydraena pygmaea

The Pygmy Moss Beetle

IUCN Regionally Extinct

The only record is for Killarney in June 1917 by Edwin Bullock. The typical habitat is fast streams on clay or on mossy stones.



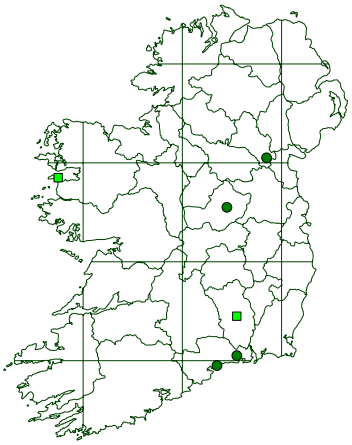
Hydraena rufipes

The Red-Legged Moss Beetle

IUCN Endangered

B2 a b (i-iv)

H. rufipes is found in clean rivers and lake edges in gravel and silt in fast or wave-washed water, as such a habitat endangered by diffuse pollution. It remains to be seen whether the contraction in range is associated with this problem.



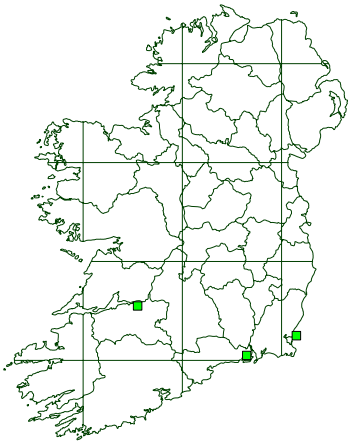
Hydraena testacea

The Shelled Moss Beetle

IUCN Vulnerable

D2

This species is associated with muddy edges of still and slowly running water bodies.

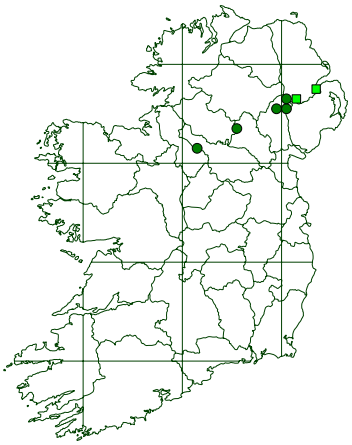


Hydrochus angustatus

The Narrow Scavenger Beetle

IUCN Regionally Extinct

This species is normally found in ponds and ditches with detritus. Records are reviewed by Foster (2007), the last being in 1911.



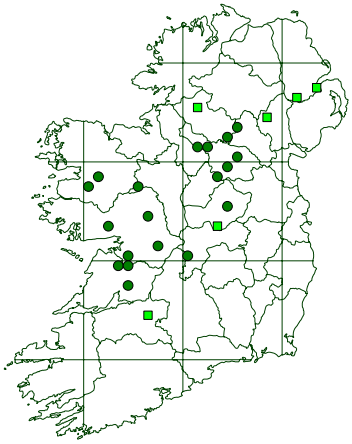
Hydrochus brevis

The Bereft Scavenger Beetle

IUCN Vulnerable

D2

Hydrochus brevis is known from Antrim, Armagh, Fermanagh and Leitrim (Foster 2007), but not Down as reported, Brackagh Bog being in Armagh. *H. brevis* occurs in well established weedy pools and fens with thick emergent vegetation, often in partial shade.



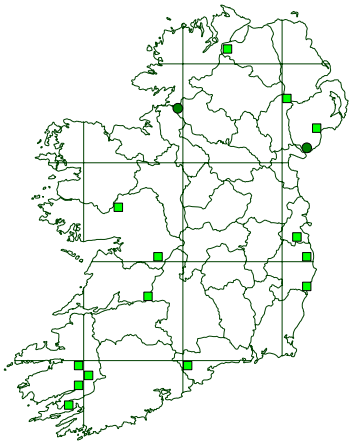
Hydrochus ignicollis

The Hotnecked Scavenger Beetle

IUCN Near Threatened

A3 c

This species is associated with lake fens in Ireland, the true *H. elongatus* (Schaller), with which it was once confused, not being known from Ireland. Records were reviewed by Foster (2007), since when there have been additional records for Clare, Galway and Offaly.



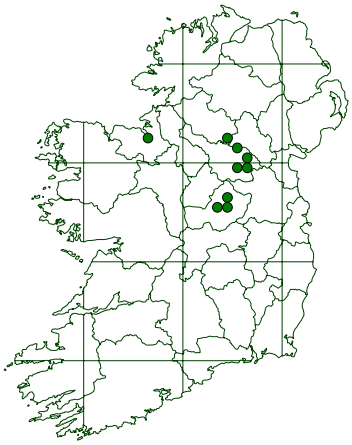
Hydrocyphon deflexicollis

The Rockhopper Beetle

IUCN Endangered

B1 B2 a b (i-iv)

This species is found in fast, undisturbed rivers and is possibly under-recorded, but it is generally regarded as rare and under threat in Europe. The only modern records come from a running waters survey in Northern Ireland (Wright, Gunn, Blackburn, Grieve, Winder and Davy-Bowker 2000).



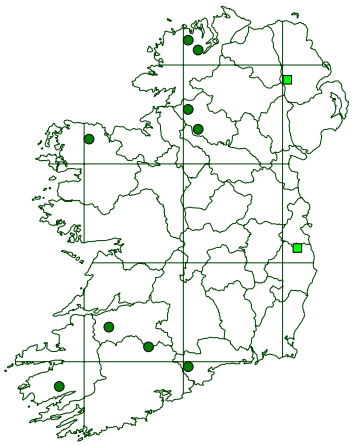
Hydroporus glabriusculus

The Three Bs Diver

IUCN Endangered

B2 a b (iii)

This species is mainly associated with vegetation rafts and tussocks in basin fens, and is rare throughout its range in western Europe.



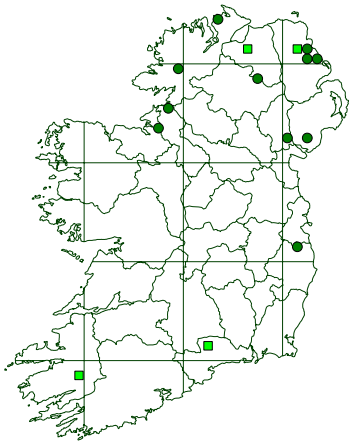
Hydroporus longicornis

Sharp's Parallel Diver

IUCN Endangered

B2 a b (iii)

This is a species of flushes in upland areas, occasionally in valley mires. It is much less frequent in Ireland than in Scotland and north-west England.



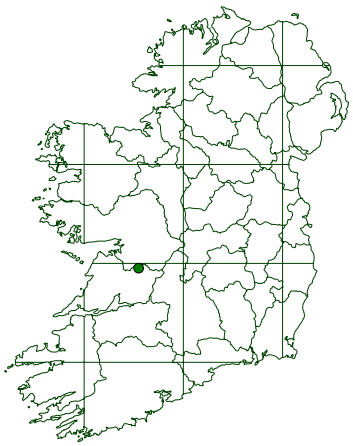
Hydroporus morio

The Quicksilver Diver

IUCN Vulnerable

A3 c

Typically found in shallow, peaty montane-ponds and lakes. Climate change may already have affected the populations of this species on southern mountain massifs in Ireland.

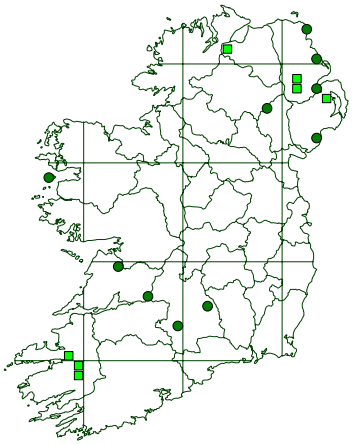


Hydroporus neglectus

The Neglected Diver

IUCN Data Deficient

One male was found in a conifer plantation beside Lough Graney in 2003 (Smith 2004). No more specimens have been found in two further searches of the area. This species is typical of puddles in forest and of acid fen. It readily resorts to flight, and this may have been a stray individual.



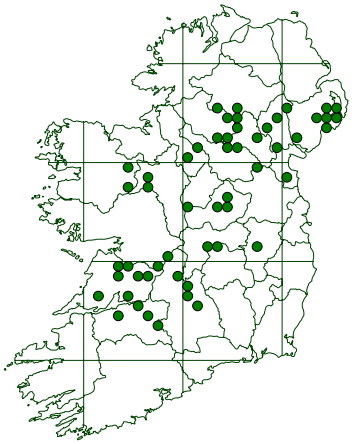
Hydroporus obsoletus

The Semisubterranean Diver

IUCN Near Threatened

A3 c

In northern Europe, where this species is semisubterranean, living in springs, it is generally regarded as a rare species and sometimes considered under threat. It is a fairly frequent stream species in Mediterranean countries.



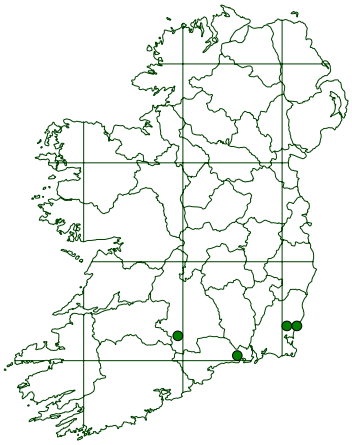
Hydroporus scalesianus

Mr Scales's Beetle

IUCN Near Threatened

A3 c

This species was discovered in central Ireland in 1986 and has subsequently been found in many lake fens and in cutover bogs. It would be considered of least concern were it not extremely rare in Scotland, Wales and England, where it is associated with relict fen largely on the coast.

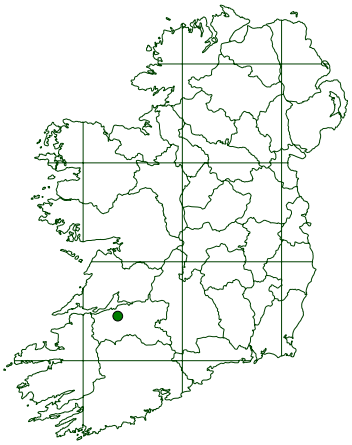


Hydrovatus clypealis

The Buckler Diver

IUCN Data Deficient

H. clypealis occurs in lowland muddy ponds and ditches, with marginal rafts of vegetation. It is often in waters of relatively recent origin or in natural sites that have been disturbed. *H. clypealis* was first reported in Waterford in 2002 (Nelson and Foster 2005), and subsequently found in South Tipperary by GNF and in Wexford independently by Margherita Gioria and Stephen McCormack. This species is expanding its range elsewhere.



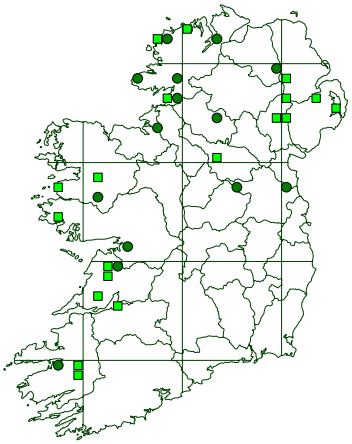
Hygrotus decoratus

The Decorous Diver

IUCN Critically Endangered

B2 a b (iii)

Common in Ballyhibbin Lough, Limerick in 2004 (Marnell and O Connor 2005). A species typical of relict mesotrophic and naturally rich fens, and its occurrence in Ireland almost certainly reflects genuine rarity, hence its not being classified as data-deficient.



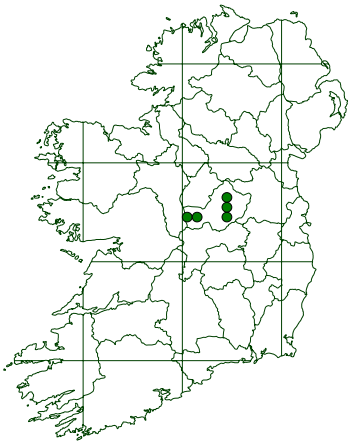
Hygrotus novemlineatus

The Nine-lined Diver

IUCN Vulnerable

A3 c

Found in exposed lakes with sandy or marly substrata and little organic material. Although still well established in western loughs in Ireland this species can be affected by climate change and by a reduction in water quality. The internationally important Irish populations require vigilance.



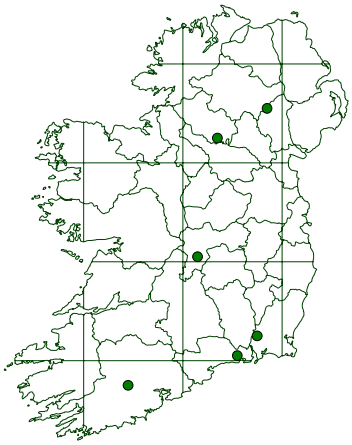
Hygrotus versicolor

The Rash Diver

IUCN Vulnerable

D2

This species is unusual amongst Irish water beetles in having a compact distribution, with an extent of occurrence of about 750 km². It is associated with manmade habitats in the rest of Europe with no evidence of decline.



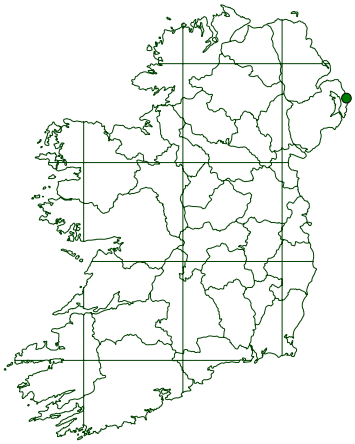
Ilybius chalconatus

The Copper Diver

IUCN Vulnerable

D2

This is usually a woodland species, though recently detected spreading through eastern Scotland, where it can be found in exposed, flush-fed pools. First recorded in 1992 (Nash, Anderson and O'Connor 1997), there are no confirmed earlier records.



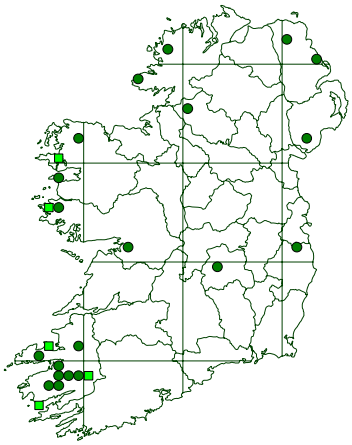
Ilybius subaeneus

The Dull Bronze Diver

IUCN Vulnerable

D2

I. subaeneus is found in temporary, stagnant water; rich in vegetation over mud and often relatively recent in origin. There are three records for 1991 in the Glastry clay pits, Down. This species has an unusual distribution, with "adjacent" sites in the north of the Isle of Man, Stranraer and the Isle of Whithorn, otherwise being centred on post-industrial sites in north-east England and the English Midlands.



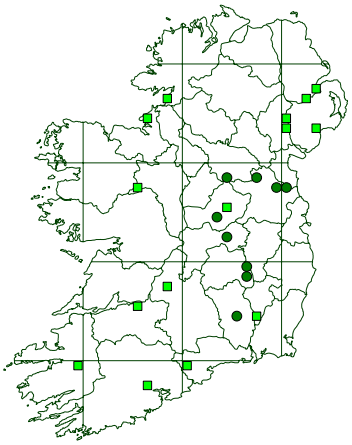
Laccobius atratus

The Charred Scavenger Beetle

IUCN Near Threatened

A3 c

This species is associated with acid flushes. These are easily damaged by pasture improvement and by afforestation.



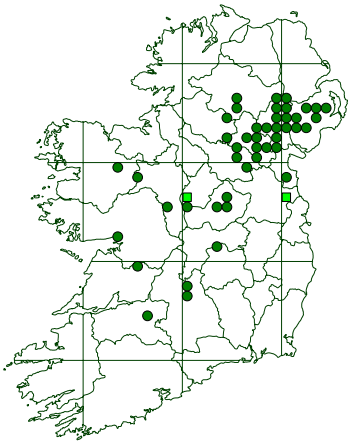
Laccophilus hyalinus

The Dinghy Skipper

IUCN Vulnerable

B2 a b (i-iv)

This species is found in vegetated river and lough edges. It appears to have been more widely distributed in the past, but has then contracted to the east; an unlikely scenario requiring further investigation of former western sites and of more museum material.



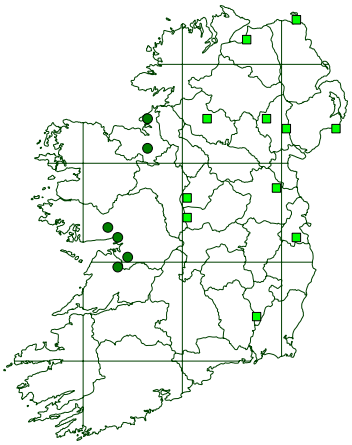
Laccornis oblongus

The Dualist

IUCN Near Threatened

A3 c

This species was first found in Ireland in Meath in 1909. Since then it has been found in many tussocky, often degraded, fens. It is raised from least concern on the basis of its association with relict fen in Scotland and England.



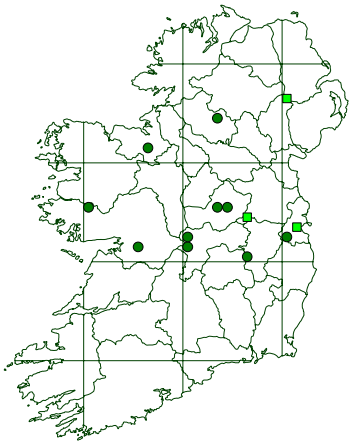
Limnebius nitidus

The Bright Moss Beetle

IUCN Endangered

B2 a b (i-iv)

This minute species is typically associated with marly ("liquid mud" – Balfour-Browne 1958) shallow water habitats. The contraction in range to the main calcareous lake areas is feasible, but needs further investigation.



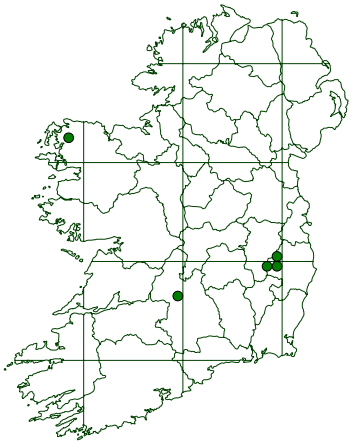
Macroplea appendiculata

The Submerged Reed Beetle

IUCN Near Threatened

A3 c

The only reed beetle to live fully submerged in Ireland. Monahan and Caffrey (1996) demonstrated this beetle is associated with pondweeds, in particular fennel pondweed (*Potamogeton pectinatus* L.). This species can be eliminated by algal blooms.

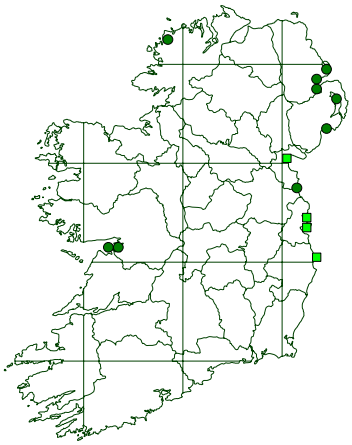


Nebrioporus depressus elegans

The Elegant Diver

IUCN Data Deficient

This species occurs in slow-flowing, running water. The *depressus* form in Ireland is almost certainly based on ancient introgression by *elegans*, but there appears to be a new arrival of *elegans* in the south; both forms occurring in Wicklow, plus a record of *elegans* in Tipperary. This complex needs re-investigation.



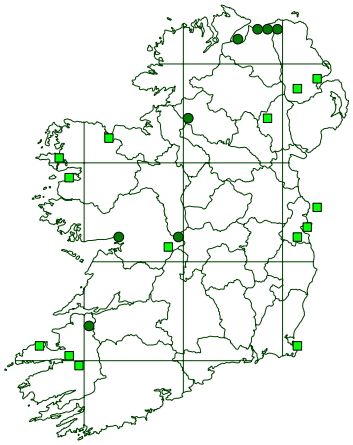
Ochthebius auriculatus

The Eared Moss Beetle

IUCN Near Threatened

A3 c

This is a saltmarsh species associated with the edges of saltpans and with saltmarsh turf.



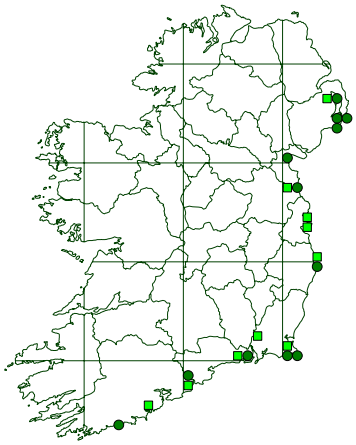
Ochthebius bicolon

The :: Moss Beetle

IUCN Vulnerable

D2

This species is typically associated with crumbly mud surfaces above running water. Some old records may refer to either *auriculatus* or *dilatatus*.



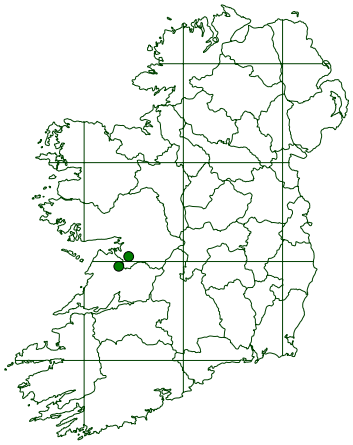
Ochthebius marinus

The Marine Moss Beetle

IUCN Near Threatened

A3 c

This is a brackish water species of the east and south coasts, the areas most likely to be affected by development.



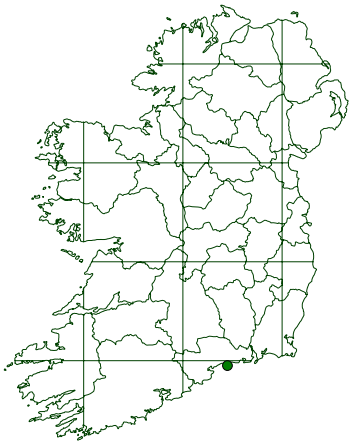
Ochthebius nilssoni

Ciaróginbán

IUCN Vulnerable

D2

This species has recently been found in deep water in three marl lakes in Clare and Galway (Foster 2008b, O'Callaghan, Foster, Bilton and Reynolds 2009). It is otherwise known only from a single lake in northern Sweden. Its rarity can be predicted with some certainty, as can the threats associated with lake enrichment.

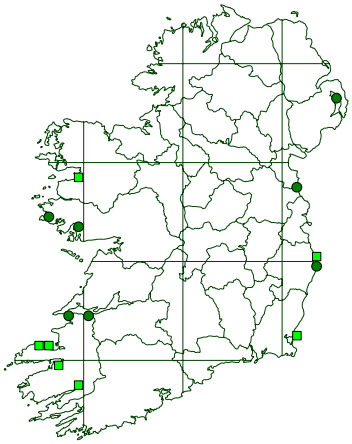


Ochthebius poweri

The Spindrift Beetle

IUCN Data Deficient

This species was discovered in its typical, coastal cliff seepages, in Waterford in 2007 (Regan and McCormack 2008).



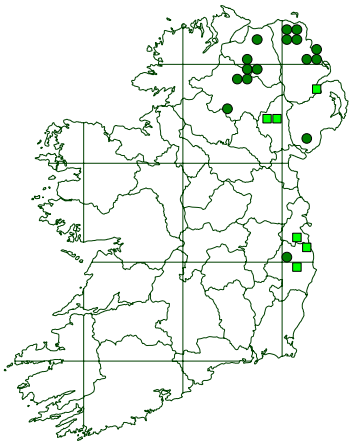
Ochthebius viridis fallaciosus

The Green Moss Beetle

IUCN Near Threatened

A3 c

This is a sparsely distributed species that appears to be confined to brackish water in Ireland. *O. viridis* has recently been treated as a superspecies complex with the Irish form being *viridis fallaciosus* (Jäch and Delgado 2008).



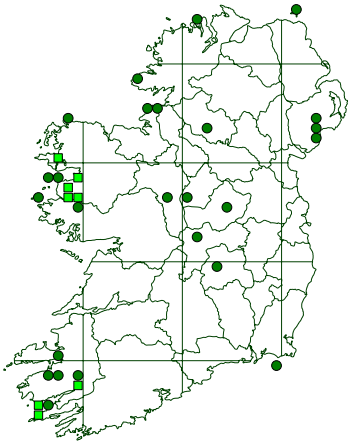
Oreodytes davisii

Davis's River Diver

IUCN Near Threatened

A3 c

O. davisii is found in clean streams, breeding in side pools and other pockets of still water. This species has declined by at least 31% in the past 25 years in Britain, and was consequently raised from least concern at the second assessment.



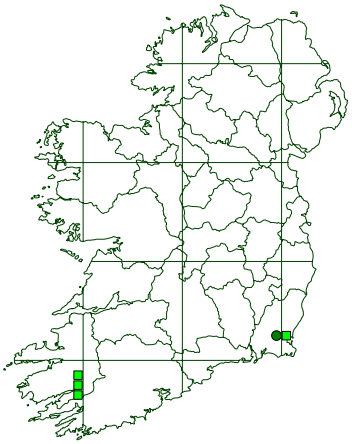
Paracymus scutellaris

The Shield Scavenger Beetle

IUCN Near Threatened

A3 c

This species is found mainly in acid flushes, sometimes on the surface of bogs, and often on Irish islands. Whilst still frequent in Ireland, its habitat is easily degraded by drainage.

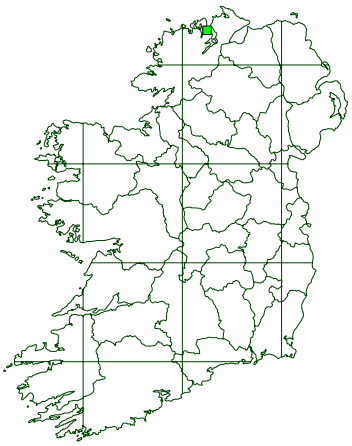


Plateumaris bracata

The Breeched Water Beetle

IUCN Critically Endangered

Nelson, Walsh and Foster (2007) document seven sightings in Kerry and Wexford, to which can be added a record by Julian Reynolds for the River Slaney near Oilgate in 2008. Associated with common reed (*Phragmites australis* (Cav.)). This is the most credible species recorded from Crincaum Lough in the Killarney National Park, as it is also known from Dinish in the Killarney Lakes. Cox (2007) omits several Irish records from his map.

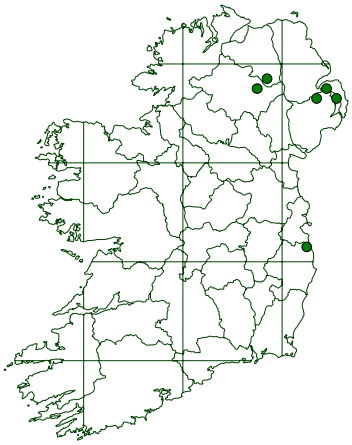


Plateumaris rustica

The Peasant Reed Beetle

IUCN Regionally Extinct

There are two records for Donegal in the Portsalon area, the last in 1913 (Nelson, Walsh and Foster 2007). It is found on sedges (*Carex* spp.).

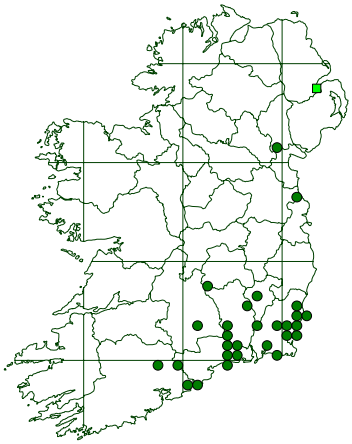


Prionocyphon serricornis

The Treehole Beetle

IUCN Data Deficient

This species was originally recorded from Powerscourt (O'Mahony 1928) where it was rediscovered in 2007, again in beech treeholes (Foster and Reynolds 2008). The habitat of this beetle has not been sufficiently sought out but Roy Anderson has recently found it across Ulster (Anderson 2008).

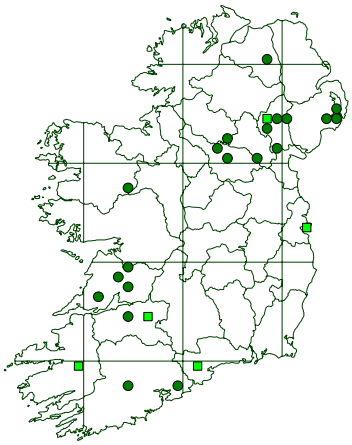


Rhantus suturalis

A Diving Beetle

IUCN least concern

This species was found several times in Belfast in 1936. New records along the south coast suggest a recent invasion, and this species may be expected to spread over much of lowland Ireland just as it has done along the east coast of Scotland to Caithness.

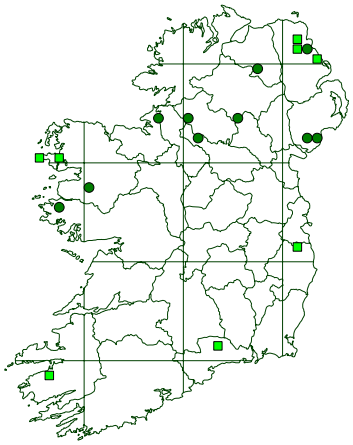


Scirtes hemisphaericus

A Jumping Marsh Beetle

IUCN least concern

S. hemisphaericus is found in richly vegetated lakes. This species is possibly under-recorded, and is expanding its range in Britain. The Irish record of the other species, *S. orbicularis*, is based on this species.



Stictotarsus multilineatus

A Bubblegum Diver

IUCN Near Threatened

A3 c

This is a species of clear mountain pools, and is likely to be affected by climate change. Robert Angus has followed up his studies of chromosomes in the *multilineatus* complex (Dutton and Angus 2007) to confirm that the Irish taxon is *multilineatus* s. str.

CONCLUSIONS

Professor Frank Balfour-Browne (1951) noted that he had withdrawn a paper from publication by the Royal Irish Academy because the referees regarded the maps as "misleading and immature". That might still be said of some of the maps presented here, and it remains to be seen to what extent the records on which they are based are sufficient to enable valid decisions on Red List status. What was certain more than 50 years ago was that Balfour-Browne had collated all the available records and what is certain now is that our database has expanded considerably. The distribution of the rare and threatened species represents the tip of the recording iceberg, and inevitably includes species on which much more information would be desirable. Finally it should be remembered that great satisfaction is gained from disproving threat status by showing rare species to be thriving; and even more pleasing is the rediscovery of species claimed to be extinct! Field entomology has a strong history of such successes.

REFERENCES

ANDERSON, R. (2008) *Prionocyphon serricornis* (Muller) (Scirtidae) in Northern Ireland. *The Coleopterist* **17** (2): 123-124.

ANDERSON, R., NASH, R. and O'CONNOR, J. P. (1997) Irish Coleoptera. A revised and annotated list. *Irish Naturalists' Journal, Special Entomological Supplement*.

BALFOUR-BROWNE, F. (1951) The aquatic Coleoptera of Ireland with some remarks on the causes of their distribution. *Entomologist's Gazette* **2** (1): 1-52.

BALFOUR-BROWNE, F. (1958) British Water Beetles **3**. Ray Society, London.

BECERRA JURADO, G., JOHNSON, J. and KELLY-QUINN, M. (2007) A new record of *Dytiscus circumflexus* Fabricius 1801, from Co. Waterford, Ireland. *Bulletin of the Irish Biogeographical Society* **31**: 194-196.

BILTON, D. T. (1988) A survey of aquatic Coleoptera in Central Ireland and the Burren. *Bulletin of the Irish biogeographical Society* **11**: 77-94.

BRADISH, S., O CONNOR, Á. and REED, T. (2002) New records of the water beetles *Berosus signaticollis* (Charpentier) and *Graptodytes bilineatus* (Sturm) in turloughs. *Irish Naturalists' Journal* **27**: 83-84.

COX, M. L. 2007. Atlas of the seed and leaf beetles of Britain and Ireland. Pisces Publications, Newbury.

CUPPEN, J. G. M. and HEIJERMAN, T. (1995) A description of the larva of *Bagous brevis* Gyllenhal, 1836 (Coleoptera: Curculionidae) with notes on its biology. *Elytron* **9**: 45-63.

DUTTON, L. A. and ANGUS, R. B. (2007) A karyosystematic investigation of a group of sibling species related to *Stictotarsus griseostriatus* (De Geer) (Coleoptera: Dytiscidae). *Comparative Cytogenetics* **1** (1): 3-16.

FOSS, P., O'CONNELL, C. and CRUSHELL, P. (2001) Bogs and Fens of Ireland Conservation Plan 2005. Irish Peatland Conservation Council, Dublin.

FOSTER, G.N. 2004. An annotated checklist of British and Irish water beetles, and associated taxa: Myxophaga and Adephaga – Hydradephaga. *The Coleopterist* **13** (4): 149-160.

FOSTER, G.N. (2005) An annotated checklist of British and Irish water beetles, and associated taxa: Polyphaga, with an update to Adephaga. *The Coleopterist* **14** (1): 7-19.

FOSTER, G.N. (2007) Notes on the status of Irish Hydrochidae (Coleoptera). *Irish Naturalists' Journal* **28** (8): 308-312.

FOSTER, G.N. (2008a) *Cyphon kongsbergensis* Munster in north-west Ireland (Coleoptera, Scirtidae). *Irish Naturalists' Journal* **29** (1): 48.

FOSTER, G [N] (2008b) The new Irish water beetle. *Biodiversity Ireland, Bulletin of the National Biodiversity Data Centre* **1**: 4-5.

FOSTER, G.N., BRATTON, J.H., EWING, A.W., HODGE, P.J. and NOBES, G. (2007) Current status of *Donacia aquatica* Linnaeus (Chrysomelidae) in Britain and Ireland. *The Coleopterist* **16** (1): 25-34.

FOSTER, G.N., NELSON, B.A., BILTON, D.T., LOTT, D.A., MERRITT, R., WEYL, R.S. and EYRE, M.D. (1992) A classification and evaluation of Irish water beetle assemblages. *Aquatic Conservation: Marine & Freshwater Ecosystems* **2**: 185-208.

FOSTER, G.N. and REYNOLDS, J.D. (2008) Rediscovery of *Prionocyphon serricornis* (Müller) (Coleoptera: Scirtidae) in Ireland. *Irish Naturalists' Journal* **29** (1): 49.

HANSEN, M., JØRUM, P., MAHLER, V. and VAGTHOLM-JENSEN, O. (1991) Niende tillaeg til "Fortegnelse over Danmarks biller" (Coleoptera). *Entomologiske Meddelelser* **59**: 5-21.

IUCN (2001) IUCN Red List Categories and Criteria. Version 3.1. IUCN, Gland, Switzerland and Cambridge, UK.

IUCN (2003) Guidelines for application of IUCN Red List criteria at regional levels. Version 3.0. Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK.

JÄCH, M.A. and DELGADO, J.A. (2008) Revision of the Palearctic species of the genus *Ochthebius* Leach XXV. The superspecies *O.* (s. str.) *viridis* Peyron and its allies (Coleoptera: Hydraenidae). *Koleopterologische Rundschau* **78**: 199-231.

JOHNSON, W.F. and HALBERT, J.N. (1902) A list of the beetles of Ireland. *Proceedings of the Royal Irish Academy* Series III, Vol. **6**: 535-827.

MARNELL, F. (2000) *Cyphon kongsbergensis* Munster (Coleoptera: Scirtidae) new to Ireland. *Irish Naturalists' Journal* **26** (7/8): 274-276.

MARNELL, F. and O CONNOR, Á. (2005) *Hygrotus decoratus* (Gyllenhal) (Coleoptera: Dytiscidae), a water beetle new to Ireland. *Irish Naturalists' Journal* **28** (3): 126-127.

McCORMACK, S. (2006) A recent Irish record of *Cyphon punctipennis* Sharp (Scirtidae) from Scragh Bog, Co. Westmeath. *The Coleopterist* **15** (1): 25.

MENZIES, I.S. and COX, M.L. (1996) Notes on the natural history, distribution and identification of British reed beetles. *British Journal of Entomology and Natural History* **9**: 137-162, 2 plates.

MONAHAN, C. and CAFFREY, J. M. (1996) *Macroplea appendiculata* (Coleoptera) in the Royal and Grand Canals: a rarity of an overlooked species in Ireland. *Bulletin of the Irish biogeographical Society* **19**: 182-188.

MORRIS, M.G. (1971) Additional records of weevils from the Burren region (Coleoptera: Curculionoidea). *Irish Naturalists' Journal* **17** (4): 139-141.

MORRIS, M.G. (1985) *Bagous brevis* Gyllenhal new to Ireland from the Burren, Co. Clare, with a brief review of the Irish Bagoini (Coleoptera: Curculionidae). *Irish Naturalists' Journal* **21**: 400-403.

MORRIS, M.G. (2002) True weevils (Part I). Coleoptera: Curculionidae (Subfamilies Raymondionyminae to Smicronychinae). *Handbooks for the Identification of British Insects* **5** (17b). Royal Entomological Society, London.

NASH, R., ANDERSON, R. and O'CONNOR, J.P. (1997) Recent additions to the list of Irish Coleoptera. *Irish Naturalists' Journal* **25**: 319-325.

NELSON, B. (2007) *Bagous lutosus* and *Stenopelmus rufinasus* new to Ireland and recent records of two other rare Irish weevils (Curculionidae and Erirhinidae) *The Coleopterist* **16**: 141-145.

NELSON, B. (2008) *Agabus melanarius* Aubé, 1837 (Coleoptera: Dytiscidae) a water beetle new to Ireland. *The Coleopterist* **17**:151-153.

NELSON, B. and ANDERSON, R. (1999) Records of uncommon wetland beetles from N. Ireland, with particular reference to Biodiversity and RDB list species. *Coleopterist* **8**: 11-16.

NELSON, B. and FOSTER, G. (2005) *Hydrovatus clypealis* (Coleoptera: Dytiscidae) new to Ireland and corrections to the Irish Coleoptera list. *Irish Naturalists' Journal* **28** (1): 35-36.

NELSON, B., WALSH, J. and FOSTER, G.N. (2007) Finding jewels amongst the reeds: a review of the Irish donaciine beetles (Coleoptera: Chrysomelidae). *Bulletin of the Irish biogeographical Society* **31**: 116-192.

O'CALLAGHAN, E., FOSTER, G.N., BILTON, D.T. and REYNOLDS, J.D. (2009) *Ochthebius nilssoni* Hebauer new for Ireland (Hydraenidae, Coleoptera). *Irish Naturalists' Journal*, in press.

O'CONNOR, J.P. and O'NEILL, L. (1985) A record of *Dytiscus circumflexus* Fabricius (Coleoptera) from Co. Wexford. *Irish Naturalists' Journal* **21**: 464.

O'MAHONY, E. (1928) *Prionocyphon serricornis* Mull., an Irish beetle. *Entomologist's Monthly Magazine* **64**: 101.

REGAN, E. and McCORMACK, S. (2008) *Ochthebius poweri* Rye (Hydraenidae), new to Ireland from Co. Waterford. *The Coleopterist* **17** (2): pp. 124.

SHEEHY SKEFFINGTON, M., MORAN, J., O CONNOR, Á., REGAN, E., COXON, C. E., SCOTT, N. E. and GORMALLY, M. (2006) Turloughs – Ireland's unique wetland habitat. *Biological Conservation* **133**: 265-290.

SMITH, M. N. (2004) *Hydroporus neglectus* Schaum, 1845 (Coleoptera: Dytiscidae) new to Ireland. *Irish Naturalists' Journal* **27** (1): 401-402.

SPEIGHT, M.C.D. (1986) *Cheilosia argentifrons* (Diptera: Syrphidae) new to Ireland; *Donacia cinerea* (Coleoptera: Chrysomelidae) and *Palloptera muliebris* (Diptera: Pallopteridae), presence in Ireland confirmed. *Irish Naturalists' Journal* **22**: 159-160.

SPRICK, P. (2000) Eignung einer Insektengruppe für die Fauna-Flora-Habitat-Richtlinie der EU (92/43/EWG, 21.Mai 1992) am Beispiel der Rüsselkäfer-Unterfamilie Bagoinae (Col., Curculionidae). *Insekta, Berlin* **6**: 98-114.

STACE, C. A. (1997) New flora of the British Isles. Cambridge University Press, Cambridge.

STELFOX, A.W. (1951) Review: The aquatic Coleoptera of Ireland with some remarks on the causes of their distribution. *Irish Naturalists' Journal* **10**: 218-224.

TIERNEY, D., BRADLEY, C., KELLY-QUINN, M. and MURRAY, D. (2002) Modern records of *Hydraena minutissima* Stephens, 1829 and of *Agabus biguttatus* Olivier, 1795 (Coleoptera) from Ireland. *Bulletin of the Irish biogeographical Society* **26**: 220-223.

VORST, O. and CUPPEN, J.G.M. (2003) A third Palaearctic species of *Chaetarthria* Stephens (Coleoptera: Hydrophilidae). *Koleopterologische Rundschau* **73**: 161-167.

WRIGHT, J.F., GUNN, R.J.M., BLACKBURN, J.H., GRIEVE, N.J., WINDER, J.M. and DAVY-BOWKER, J. (2000) Macroinvertebrate frequency data for the RIVPACS III sites in Northern Ireland and some comparisons with equivalent data for Great Britain. *Aquatic Conservation: Marine and Freshwater Ecosystems* **10**: 371-399.

FURTHER READING

BALFOUR-BROWNE, F. (1940) British Water Beetles **1**. Ray Society, London.

BALFOUR-BROWNE, F. (1950) British Water Beetles **2**. Ray Society, London.

McCORMACK, S., NOWAK, D., McCARTHY, T.K. and O CONNOR, Á. (2006) The aquatic Coleoptera of Inishbofin, Co. Galway. *Irish Naturalists' Journal* **28** (8): 315-320.

NELSON, B., FOSTER, G., WEYL, R. and ANDERSON, R. (1997) The distribution of aquatic Coleoptera in Northern Ireland. Part 1: Families Haliplidae, Hygrobiidae, Noteridae, Dytiscidae and Gyrinidae. *Bulletin of the Irish biogeographical Society* **20**: 179-296.

NELSON, B., FOSTER, G., WEYL R. and ANDERSON R. (1998) The distribution of aquatic Coleoptera in Northern Ireland. Part 2: Families Hydraenidae, Helophoridae, Hydrochidae, Hydrophilidae, Elmidae and Dryopidae. *Bulletin of the Irish biogeographical Society* **22**: 128-193.

REYNOLDS, J.D. (1998) Ireland's Freshwaters. Appendix 1: Irish Limnologists. The Marine Institute, Dublin.

APPENDIX 1: NOTES ON THE USE OF THE IUCN REGIONAL CATEGORIES AND CRITERIA FOR IRISH WATER BEETLES

The International Union for the Conservation of Nature (IUCN) revised its categories and criteria for Red List species in 2001 (IUCN 2001), and in 2003 produced guidelines for the application of the categories and criteria on a regional basis (IUCN 2003; Table 4; Figure 5).

Notes of the application of the IUCN categories and criteria in the context of Irish Water beetles are presented here.

Categories

Critically Endangered (CR)

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered, and it is therefore considered to be facing an extremely high risk of extinction in the wild.

In this review, species considered to be Critically Endangered were largely evaluated on the basis of criterion B2, a restricted or fragmented geographic range, fragmentation, associated with decline.

Endangered (EN)

A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered, and it is therefore considered to be facing a very high risk of extinction in the wild.

In this review, species considered to be Endangered were largely evaluated on the basis of criterion B2, a restricted or fragmented geographic range, fragmentation, associated with decline.

Vulnerable (VU)

A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable, and it is therefore considered to be facing a high risk of extinction in the wild.

In this review, the choice of species considered to be Vulnerable was largely based on criterion D2, a very small or restricted population based on an area of occupancy of less than 20 km^2.

Near Threatened (NT)

A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for CR, EN or VU now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

Least Concern (lc)

A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for CR, EN, VU or NT. Widespread and abundant taxa are included in this category.

Data Deficient (dd)

A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of extinction risk. In this review, data-deficient taxa include:

a. taxa in cryptic species-pairs that have been insufficiently studied (*Chaetarthria seminulum* s. str., *Nebrioporus elegans*);

b. species only recently discovered in Ireland for which there is reason to believe that more sites can be found (*Bagous lutosus, Cyphon palustris, Hydroporus neglectus*);

c. species both poorly understood and poorly recorded (*Elodes* spp.);

d. species occupying under-recorded specialist habitats (*Georissus crenulatus, Prionocyphon serricornis*);

e. species with only old records that cannot be pinpointed and are in doubt, e.g. *Hygrotus parallellogrammus*.

Not evaluated (NE)

Given that we have acquired so many records of Irish water beetles, claiming that a species included in the database has not been evaluated is scarcely credible. All aquatic species previously assigned NE have been moved to dd.

Criteria

Criterion A - Past, present or future population reduction

Criterion A1 was not used as it is largely based on population counts, which are neither available nor relevant for water beetles.

Population size reductions are expected to be measured in terms of the past ten years or three generations, whichever is the longer. This is impracticable for most insects in that the database is insufficient to measure reliably over a ten year period. The database can, however, be divided into records before 1980 and from 1980 onwards. The earlier part of the database is about three times smaller than the more recent section, so any reduction in occupancy between these two sections must strongly indicate that there has been a genuine reduction.

Species are considered to be extinct if they have not been recorded since 1939. Species recorded after that, but not from 1980 onwards, are generally considered to be Critically Endangered.

The occupancy of 10 km squares has been taken as our most reliable estimate of population size, rather than occupancy of individual sites. An observed, inferred or suspected decline in the quality

of habitat may also be cited for certain species. The effects of alien species or natural enemies cannot be applied to any particular species but it may be inferred that species such as the Zebra Mussel (*Dreissena polymorpha* (Pallas)) can adversely affect water quality.

Criterion B - Restricted geographic range, fragmentation, continuing decline or extreme fluctuations

The occupancy of 10 km squares has been used to estimate the area of occupancy.

Criterion C - Small population size and continuing decline based on counts of mature individuals.

This criterion was not used because it is largely based on population counts, which are neither available nor relevant for water beetles, and are indeed inappropriate to most insect populations.

Criterion D - Very small or restricted population

Criterion D1 was not used because it is based on the number of mature individuals, which is neither available nor relevant for water beetles.

Criterion E - Quantitative analysis

This criterion was not used as it requires detailed data on population sizes and declines over time, which is not available for water beetles.

Regional Lists

Regional assessments should generate a list including:

- scientific name and authority
- Regional Red List Category
- global Red List Category
- estimate of the proportion (%) of the global population in the region
- detail of any regionally determined modifications to the criteria or categories
- taxonomic standards followed
- whether regionally breeding taxa, visitors or vagrants.

The two-stage process in relation to developing a Red List of Irish water beetles

The IUCN regional guidelines (IUCN 2003) indicate that populations in the region under assessment should firstly be assessed as if they were isolated taxa. They should then be reassessed and can be assigned a higher or a lower category ("uplisting" and "downlisting" respectively). The reality for Irish water beetles is that no neighbouring countries have been taken through the new

assessment process and that interactions of the Irish fauna with other parts of Europe are not fully understood. The Red Data Book for British insects is based on earlier criteria, and there is no assessment other than of extinction for France and the Netherlands. Modern Red Lists are available for most Scandinavian countries and for some central European countries (Appendix 3). The distribution and conservation statuses of British water beetles are well known – and can sometimes be used to uplist (↑ in Table 5 in Appendix 2) or downlist (↓) Irish species when there is evidence of the potential for a species to go into decline or to increase. The first and second stage assessments are summarised in Table 5 in Appendix 2, the status accorded in individual species accounts being that after second stage assessment.

This two-stage process to develop the Red List should not be confused with the three step process proposed to develop conservation priorities by Fitzpatrick, Murray, Paxton and Brown (2007), nor with the eight criteria that they also propose to identify a national list of Priority Species.

References

FITZPATRICK, Ú., MURRAY, T. E., PAXTON, R. J. and BROWN, M. J. F. (2007) Building on IUCN Regional Red Lists to produce lists of species of conservation priority: a model with Irish bees. *Conservation Biology* **21**: 1324-1332.

IUCN (2001) IUCN Red List Categories and Criteria. Version 3.1. IUCN, Gland, Switzerland and Cambridge, UK.

IUCN (2003) Guidelines for application of IUCN Red List criteria at regional levels. Version 3.0. Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK.

APPENDIX 2: CHECKLIST OF IRISH WATER BEETLES

Table 5: Checklist of Irish water beetles, those mapped being **emboldened**. Abbreviations are as in Table 1 and Appendix 1. An explanation of the first and second stage assessments is also included in Appendix 1. ΦRefers to the number of 10 km squares in which the species has been recorded pre- and post 1980 [t] largely terrestrial species that have not been evaluated. *changes in status made subsequent to committee meetings, based on acquisition of significant new records

	1st stage assessment	2nd stage assessment	Criteria	Pre-1980 Φ	Post-1980 Φ
Suborder Adephaga					
GYRINIDAE					
Gyrinus aeratus Stephens	lc	lc			
Gyrinus caspius Ménétriés	lc	lc			
***Gyrinus distinctus* Aubé**	lc	↑ nt	A3 c	3	24
Gyrinus marinus Gyllenhal	lc	lc			
Gyrinus minutus Fab.	lc	lc			
***Gyrinus natator* (L.)**	lc	↑ nt	A3 c	3	26
Gyrinus paykulli Ochs	lc	lc			
Gyrinus substriatus Stephens	lc	lc			
***Gyrinus urinator* Illiger**	nt	nt	A3 c	6	17
Orectochilus villosus (Müller)	lc	lc			
HALIPLIDAE					
Brychius elevatus (Panzer)	lc	lc			
***Haliplus apicalis* Thomson**	CR	EN*	B2 a b (i, iii)	2	2
Haliplus confinis Stephens	lc	lc			
Haliplus flavicollis Sturm	lc	lc			
Haliplus fluviatilis Aubé	lc	lc			
Haliplus fulvus (Fab.)	lc	lc			
Haliplus immaculatus Gerhardt	lc	lc			
Haliplus lineatocollis (Marsham)	lc	lc			
***Haliplus lineolatus* Mannerheim**	nt	nt	A3 c	21	55
Haliplus obliquus (Fab.)	lc	lc			
Haliplus ruficollis (De Geer)	lc	lc			
Haliplus sibiricus Motschulsky	lc	lc			
***Haliplus variegatus* Sturm**	nt	↑ VU	B2 a b (iii)	6	12
NOTERIDAE					
Noterus clavicornis (De Geer)	lc	lc			
Noterus crassicornis (Müller)	lc	lc			
HYGROBIIDAE					
Hygrobia hermanni (Fab.)	lc	lc			
DYTISCIDAE					
Liopterus haemorrhoidalis (Fab)	lc	lc			
***Laccornis oblongus* (Stephens)**	lc	↑ nt	A3 c	2	45
***Hydrovatus clypealis* Sharp**	dd	dd		0	4
***Bidessus minutissimus* (Germar)**	RE	RE		4	0

	1st stage assessment	2nd stage assessment	Criteria	Pre-1980 Φ	Post-1980 Φ
Hygrotus confluens (Fab.)	lc	lc			
***Hygrotus decoratus* (Gyllenhal)**	CR	CR	B2 a b (iii)	0	1
Hygrotus impressopunctatus (Schaller)	lc	lc			
Hygrotus inaequalis (Fab.)	lc	lc			
***Hygrotus novemlineatus* (Stephens)**	nt	↑ VU	A3 c	21	14
Hygrotus parallellogrammus (Ahrens)	dd	dd		1?	0
Hygrotus quinquelineatus (Zetterstedt)	lc	lc			
***Hygrotus versicolor* (Schaller)**	EN	↓ VU	D2	0	5
Hyphydrus ovatus (L.)	lc	lc			
Hydroporus angustatus Sturm	lc	lc			
Hydroporus discretus Fairmaire & Brisout	lc	lc			
Hydroporus erythrocephalus (L.)	lc	lc			
***Hydroporus glabriusculus* Aubé**	VU	↑ EN	B2 a b (iii)	0	9
Hydroporus gyllenhalii Schiödte	lc	lc			
Hydroporus incognitus Sharp	lc	lc			
***Hydroporus longicornis* Sharp**	EN	EN	B2 a b (iii)	2	8
Hydroporus longulus Mulsant	lc	lc			
Hydroporus melanarius Sturm	lc	lc			
Hydroporus memnonius Nicolai	lc	lc			
***Hydroporus morio* Aubé**	VU	VU	A3 c	7	11
***Hydroporus neglectus* Schaum**	dd	dd		0	1
Hydroporus nigrita (Fab.)	lc	lc			
Hydroporus obscurus Sturm	lc	lc			
***Hydroporus obsoletus* Aubé**	lc	↑ nt	A3 c	8	10
Hydroporus palustris (L.)	lc	lc			
Hydroporus planus (Fab.)	lc	lc			
Hydroporus pubescens (Gyllenhal)	lc	lc			
***Hydroporus scalesianus* Stephens**	lc	↑ nt	A3 c	0	53
Hydroporus striola (Gyllenhal)	lc	lc			
Hydroporus tessellatus Drapiez	lc	lc			
Hydroporus tristis (Paykull)	lc	lc			
Hydroporus umbrosus (Gyllenhal)	lc	lc			
Porhydrus lineatus (Fab.)	lc	lc			
***Graptodytes bilineatus* (Sturm)**	nt	nt	B2 b (iii)	0	12
Graptodytes granularis (L.)	lc	lc			
Graptodytes pictus (Fab.)	lc	lc			
***Oreodytes davisii* (Curtis)**	lc	↑ nt	A3 c	5	16
Oreodytes sanmarkii (Sahlberg)	lc	lc			
Oreodytes septentrionalis (Gyllenhal)	lc	lc			
Suphrodytes dorsalis (Fab.)	lc	lc			
Stictotarsus duodecimpustulatus (Fab.)	lc	lc			
***Stictotarsus multilineatus* (Falkenström)**	nt	nt	A3 c	8	10
Stictonectes lepidus (Olivier)	lc	lc			
Nebrioporus assimilis (Paykull)	lc	lc			
Nebrioporus depressus depressus (Fab.)	lc	lc			

	1st stage assessment	2nd stage assessment	Criteria	Pre-1980 Φ	Post-1980 Φ
***Nebrioporus depressus elegans* (Panzer)**	dd	dd		0	5
Agabus affinis (Paykull)	lc	lc			
***Agabus arcticus* (Paykull)**	nt	nt	A3 c	4	18
Agabus biguttatus (Olivier)	lc	lc			
Agabus bipustulatus (L.)	lc	lc			
***Agabus congener* (Thunberg)**	VU	VU	A3 c	1	13
***Agabus conspersus* (Marsham)**	EN	EN	B2 a b (iii)	11	6
Agabus guttatus (Paykull)	lc	lc			
***Agabus labiatus* (Brahm)**	nt	nt	A3 c	4	15
***Agabus melanarius* Aubé**	-	dd		0	1
Agabus nebulosus (Forster)	lc	lc			
Agabus paludosus (Fab.)	lc	lc			
Agabus sturmii (Gyllenhal)	lc	lc			
Agabus unguicularis (Thomson)	lc	lc			
Ilybius aenescens Thomson	lc	lc			
Ilybius ater (De Geer)	lc	lc			
***Ilybius chalconatus* (Panzer)**	VU	VU	D2	0	6
Ilybius fuliginosus (Fab.)	lc	lc			
Ilybius guttiger (Gyllenhal)	lc	lc			
Ilybius montanus (Stephens)	lc	lc			
Ilybius quadriguttatus (Lacordaire)	lc	lc			
***Ilybius subaeneus* Erichson**	VU	VU	D2	0	1
***Platambus maculatus* (L.)**	-	dd		0	1
Rhantus exsoletus (Forster)	lc	lc			
Rhantus frontalis (Marsham)	lc	lc			
Rhantus grapii (Gyllenhal)	lc	lc			
***Rhantus suturalis* (Macleay)**	lc	lc			
Rhantus suturellus (Harris)	lc	lc			
Colymbetes fuscus (L.)	lc	lc			
***Laccophilus hyalinus* (De Geer)**	EN	↓ VU	B2 a b (i-iv)	16	9
Laccophilus minutus (L.)	lc	lc			
Hydaticus seminiger (De Geer)	lc	lc			
Acilius canaliculatus (Nicolai)	lc	lc			
Acilius sulcatus (L.)	lc	lc			
***Dytiscus circumcinctus* Ahrens**	lc	↑ nt	A3 c	5	29
***Dytiscus circumflexus* Fab.**	VU	↓ lc		0	7
***Dytiscus lapponicus* Gyllenhal**	nt	nt	A3 c	2	11
Dytiscus marginalis L.	lc	lc			
Dytiscus semisulcatus Müller	lc	lc			
Suborder Polyphaga					
HYDRAENIDAE					
Hydraena britteni Joy	lc	lc			
Hydraena gracilis Germar	lc	lc			
***Hydraena minutissima* Stephens**	CR	CR	B2 a b (i-iv)	7	1

	1st stage assessment	2nd stage assessment	Criteria	Pre-1980 Φ	Post-1980 Φ
***Hydraena nigrita* Germar**	VU	VU	D2	3	4
***Hydraena pulchella* Germar**	RE	RE		11	0
***Hydraena pygmaea* Waterhouse**	RE	RE		1	0
Hydraena riparia Kugelann	lc	lc			
***Hydraena rufipes* Curtis**	EN	EN	B2 a b (i-iv)	12	5
***Hydraena testacea* Curtis**	VU	VU	D2	2	4
***Limnebius nitidus* (Marsham)**	EN	EN	B1 B2ab(i-iv)	11	6
Limnebius truncatellus (Thunberg)	lc	lc			
***Ochthebius auriculatus* Rey**	nt	nt	A3 c	5	9
***Ochthebius bicolon* Germar**	VU	VU	D2	14	8
Ochthebius dilatatus Stephens	lc	lc			
Ochthebius lejolisii Mulsant & Rey	lc	lc			
***Ochthebius marinus* (Paykull)**	nt	nt	A3 c	12	12
Ochthebius minimus (Fab.)	lc	lc			
***Ochthebius nilssoni* Hebauer**	dd	↑VU	D2	0	2
***Ochthebius poweri* Rye**	dd	dd		0	1
Ochthebius punctatus Stephens	lc	lc			
***Ochthebius viridis fallaciosus* Ganglbauer**	nt	nt	A3 c	7	7
***Enicocerus exsculptus* (Germar)**	EN	EN	B2 a b (i-iv)	4	7
HELOPHORIDAE					
Helophorus aequalis Thomson	lc	lc			
***Helophorus alternans* Gené**	RE	RE		1	0
***Helophorus arvernicus* Mulsant**	CR	EN*	B2 a b (ii, iii)	4	3
Helophorus brevipalpis Bedel	lc	lc			
Helophorus flavipes Fab.	lc	lc			
***Helophorus fulgidicollis* Motschulsky**	VU	VU	D2	7	8
Helophorus grandis Illiger	lc	lc			
***Helophorus granularis* (L.)**	CR	EN*	A2 b c B2 b (i-iv)	19	3
Helophorus griseus Herbst	lc	lc			
Helophorus minutus Fab.	lc	lc			
***Helophorus nanus* Sturm**	VU	VU	D2	1	5
Helophorus nubilus Fab. [t]	NE	NE			
Helophorus obscurus Mulsant	lc	lc			
Helophorus porculus Bedel [t]	NE	NE			
***Helophorus strigifrons* Thomson**	VU	VU	D2	2	3
GEORISSIDAE					
***Georissus crenulatus* (Rossi)**	dd	dd		2	1
HYDROCHIDAE					
***Hydrochus angustatus* Germar**	RE	RE		3	0
***Hydrochus brevis* (Herbst)**	VU	VU	D2	4	5
***Hydrochus ignicollis* Motschulsky**	lc	↑ nt	A3 c	6	18
HYDROPHILIDAE					
Hydrophilinae					
***Berosus luridus* (L.)**	CR	CR	B2 a b (iii)	5	2
***Berosus signaticollis* (Charpentier)**	EN	EN	A3 c B2 a b (iii)	0	6

	1st stage assessment	2nd stage assessment	Criteria	Pre-1980 Φ	Post-1980 Φ
***Chaetarthria seminulum* (Herbst)**	dd	dd		2	7
Chaetarthria simillima Vorst & Cuppen	lc	lc			
***Paracymus scutellaris* (Rosenhauer)**	lc	↑ nt	A3 c	11	24
Anacaena globulus (Paykull)	lc	lc			
Anacaena limbata (Fab.)	lc	lc			
Anacaena lutescens (Stephens)	lc	lc			
***Laccobius atratus* (Rottenberg)**	lc	↑ nt	A3 c	6	20
Laccobius bipunctatus (Fab.)	lc	lc			
Laccobius colon (Stephens)	lc	lc			
Laccobius minutus (L.)	lc	lc			
Laccobius striatulus (Fab.)	lc	lc			
Laccobius ytenensis Sharp	lc	lc			
Helochares punctatus Sharp	lc	lc			
Enochrus affinis (Thunberg)	lc	lc			
Enochrus bicolor (Fab.)	lc	lc			
Enochrus coarctatus (Gredler)	lc	lc			
Enochrus fuscipennis (Thomson)	lc	lc			
***Enochrus halophilus* (Bedel)**	VU	VU	D2	2	6
***Enochrus melanocephalus* (Olivier)**	VU	↓ nt	A3 c	5	7
Enochrus ochropterus (Marsham)	lc	lc			
Enochrus testaceus (Fab.)	lc	lc			
Cymbiodyta marginellus (Fab.)	lc	lc			
Hydrobius fuscipes (L.)	lc	lc			
Sphaeridiinae					
Coelostoma orbiculare (Fab.)	lc	lc			
Cercyon analis (Paykull) [t]	NE	NE			
Cercyon convexiusculus Stephens	lc	lc			
Cercyon depressus Stephens	lc	lc			
Cercyon haemorrhoidalis (Fab.) [t]	NE	NE			
Cercyon impressus (Sturm) [t]	NE	NE			
Cercyon lateralis (Marsham) [t]	NE	NE			
Cercyon littoralis (Gyllenhal)	lc	lc			
Cercyon marinus Thomson	lc	lc			
Cercyon melanocephalus (L.) [t]	NE	NE			
Cercyon nigriceps (Marsham) [t]	NE	NE			
Cercyon obsoletus Gyllenhal [t]	NE	NE			
Cercyon pygmaeus (Illiger) [t]	NE	NE			
Cercyon sternalis Sharp	lc	lc			
Cercyon terminatus (Marsham) [t]	NE	NE			
Cercyon tristis (Illiger)	lc	lc			
Cercyon unipunctatus (L.) [t]	NE	NE			
Cercyon ustulatus (Preyssler)	lc	lc			
Megasternum concinnum (Marsham) [t]	NE	NE			
Cryptopleurum minutum (Fab.) [t]	NE	NE			
Cryptopleurum subtile Sharp [t]	NE	NE			

	1st stage assessment	2nd stage assessment	Criteria	Pre-1980 Φ	Post-1980 Φ
Sphaeridium lunatum Fab. [t]	NE	NE			
Sphaeridium marginatum Fab. [t]	NE	NE			
Sphaeridium scarabaeoides (L.) [t]	NE	NE			
SCIRTIDAE					
***Elodes elongata* Tournier**	dd	dd		1	2
***Elodes minuta* (L.)**	dd	dd		1	1
***Elodes pseudominuta* Klausnitzer**	dd	dd		1	1
Odeles marginata (Fab.)	lc	lc			
Microcara testacea (L.)	lc	lc			
Cyphon coarctatus Paykull	lc	lc			
Cyphon hilaris Nyholm	lc	lc			
***Cyphon kongsbergensis* Munster**	VU	VU	D2	0	5
Cyphon laevipennis Tournier	lc	lc			
Cyphon ochraceus Stephens	lc	lc			
Cyphon padi (L.)	lc	lc			
***Cyphon palustris* Thomson**	dd	dd		0	4
***Cyphon pubescens* (Fab.)**	lc	lc			
***Cyphon punctipennis* Sharp**	VU	VU	A3 c	2	9
Cyphon variabilis (Thunberg)	lc	lc			
***Prionocyphon serricornis* (Müller)**	dd	dd		1	6
***Hydrocyphon deflexicollis* (Müller)**	EN	EN	B1 B2 a b (i-iv)	14	2
***Scirtes hemisphaericus* (L.)**	nt	↓ lc			
ELMIDAE					
Elmis aenea (Müller)	lc	lc			
Oulimnius tuberculatus (Müller)	lc	lc			
Limnius volckmari (Panzer)	lc	lc			
Esolus parallelepipedus (Müller)	lc	lc			
DRYOPIDAE					
Dryops ernesti des Gozis	lc	lc			
Dryops luridus (Erichson)	lc	lc			
***Dryops similaris* Bollow**	nt	nt	A3 c	0	18
HETEROCERIDAE					
Augyles maritimus (Guérin-Méneville)	dd	dd		3	1
Heterocerus fenestratus (Thunberg)	dd	dd		0	2
Heterocerus flexuosus Stephens	dd	dd		6	2
Heterocerus fossor Kiesenwetter	dd	dd		3	0
Heterocerus marginatus (Fab.)	dd	dd		3	0
CHRYSOMELIDAE					
***Plateumaris bracata* (Scopoli)**	RE	CR*	B1 B2 a b (i,ii,iv)	5	1
Plateumaris discolor (Panzer)	lc	lc			
***Plateumaris rustica* (Kunze)**	RE	RE		1	0
Plateumaris sericea (L.)	lc	lc			
***Donacia aquatica* (L.)**	VU	VU	D2	5	7
Donacia bicolora Zschach	lc	lc			
***Donacia cinerea* Herbst**	VU	VU	D2	1	4

	1st stage assessment	2nd stage assessment	Criteria	Pre-1980 Φ	Post-1980 Φ
Donacia clavipes Fab.	lc	lc			
Donacia crassipes Fab.	lc	lc			
***Donacia dentata* Hoppe**	dd	dd		1?	0
Donacia impressa Paykull	lc	lc			
***Donacia marginata* Hoppe**	nt	nt	A3 c	7	8
Donacia obscura Gyllenhal	lc	lc			
***Donacia semicuprea* Panzer**	RE	RE		2	0
Donacia simplex Fab.	lc	lc			
***Donacia sparganii* Ahrens**	dd	dd		1	0
Donacia thalassina Germar	lc	lc			
Donacia versicolorea (Brahm)	lc	lc			
Donacia vulgaris Zschach	lc	lc			
***Macroplea appendiculata* (Panzer)**	nt	nt	A3 c	3	10
CURCULIONOIDEA					
***Bagous alismatis* (Marsham)**	CR	CR	A2 b c	10	0
***Bagous brevis* Gyllenhal**	CR	CR	B2 a b (iii)	1	3
***Bagous collignensis* (Herbst)**	dd	dd		1	0
***Bagous frit* (Herbst)**	VU	VU	D2	0	5
***Bagous glabrirostris* (Herbst)**	RE	RE		3	0
***Bagous limosus* (Gyllenhal)**	CR	CR	B2 a b (iii)	1	5
***Bagous lutosus* (Gyllenhal)**	dd	dd		0	2
***Bagous lutulentus* (Gyllenhal)**	CR	CR	B2 a b (iii)	4	6

APPENDIX 3: NOTES ON RED LISTS IN EUROPE

Red List coverage for water beetles in Europe is patchy but improving. Data have been assembled for twelve countries in non-Mediterranean Europe (Table 6). Data for Iberia and France are lacking, and would in any case prove misleading as there the main conservation concern would be for species endemic to the Massif Central, the Pyrenees and other Iberian mountain systems. Four hundred and fifty three taxa have some form of assessment, the lowest levels being Nationally Scarce List B (Nb) in Great Britain, a species recorded from 31-100 10 km squares but without being considered at risk, and data-deficient. One hundred and fifty nine of these taxa have been recorded from Ireland.

For **Austria,** the Hydraenidae and Elmidae have been assessed by Jäch, Dietrich and Raunig (2005). **(A 05)**. The rest of the water beetles have yet to be assessed (Manfred Jäch, pers. comm.).

For the **Czech Republic**, there is an authoritative, IUCN-based, Red List (Farkač, Král and Škorpík 2005), drawing on expert opinion for each small group of water beetles. **(Cz 05).**

For **Great Britain,** it was intended that the original British Red Data Book (Shirt 1987) would be replaced by a revision of these statuses in the Joint Nature Conservation Committee (JNCC) review of the scarce and threatened Coleoptera. The second part of that review (Hyman and Parsons 1992) has the water beetles listed in its Appendix 1. The third part of this review was never formally published, though a version was temporarily available at the JNCC website in 2002. That version broke new ground at the time, in that IUCN criteria were applied to produce a new series of statuses, but the statuses were not based on the regional criteria devised subsequently. The only usable designations are in those in Hyman and Parsons (1992, 1994), but the date of extinction in GB has been equated with that used in Ireland, i.e. 1939. **(GB 92).**

For **Denmark** a recent catalogue (Hansen 1996) can be used because it lists, for each of eleven recording areas, species not found since 1959 ("2") and before 1900 as "1". However, very few species are extinct throughout their range in Denmark, and none of the six species is Irish. **(Dk 96).**

For **Finland**, the species lists are available at www.environment.fi, based on evaluations completed in 2000. **(Fi 00).**

For **France** we have a recent checklist (Queney 2004) but it has no listing of status, two taxa being "peut-être disparu", neither of them Irish.

There are numerous red lists within **Germany**, the latest compilation for the whole country seemingly being in 1998. **(D 98)**.

For **Lithuania** there is a Red List based on early IUCN criteria accessible at www3.lrs.lt **(Li 03)**.

For **Luxemburg**, there is a checklist noting 23 species of water beetle that have not been recorded for about a hundred years (Gerend 2003). **(Lu 03).**

For the **Netherlands**, the category a "*uitgestorven of verdwenen soorten*" is included in the identification guide by Drost, Cuppen, Van Nieukerken and Schreijer (1992). **(NL92).**

For **Norway**, we have an IUCN Red List written by coleopterists (Ødegaard, Andersen, Hanssen, Kvamme and Olberg 2006) **(N 06).**

For **Poland** we have an IUCN Red List written by entomological experts (Pawłowski, Kubisz and Mazur 2002). **(P 02).**

The IUCN-based Red List for **Sweden** (Gärdenfors 2005) gives cause for concern in that Sweden has a world expert on water beetles who does not seem to have been consulted on decisions about their status. **(S 05).**

References for European Red Lists

BAMEUL, F. (2004) Nouveaux localités de *Gyrinus natator* (L.) en Aquitaine (Coleoptera, Gyrinidae). *Bulletin de la Société Linnéenne de Bordeaux* **32** (3): 225-231.

DROST, M.B.P., CUPPEN, H.P.J.J., VAN NIEUKERKEN, E.J. and SCHREIJER, M. (1992) *De waterkevers van Nederland*. Uitgeverij Koninklijke Nederlandse Natuurhistorische Vereniging, Utrecht.

FARKAČ, J., KRÁL, D. and ŠKORPÍK, M. (eds) (2005) *Červený seznam ohrožených druhů České republiky* [*Red list of threatened species in the Czech Republic. Invertebrates*] Agentura ochrany přírody a krajiny ČR, Prague. **(CZ 04)**

BENEDIKT, S. and STREJČEK, J. (2005) Curculionidae (nosatci). 545-555.

BOUKAL, D. S. (2005) Elmidae. 462-463.

BOUKAL, D. S. (2005) Hydraenidae (vodanovití). 419-420.

BOUKAL, D. S. (2005) Limnichidae. 459-461.

BOUKAL, D. S. (2005) Psephenidae. 458.

BOUKAL, D. S. (2005) Scirtidae. 450.

BOUKAL, M. (2005) Haliplidae (plavčíkovití). 412-413.

HÁJEK, J. and ŠŤASTNÝ, J. (2005) Dytiscidae (potápníkovití). 414-416.

HÁJEK, J. 2005. Gyrinidae (vírníkovití). 417-418.

STREJČEK, J. and BEZDĚK, J. (2005) Chrysomelidae (mandelikovití). 533-539.

TRÁVNÍČEK, D., FIKÁČEK, M. and BOUKAL, M. (2005) Hydrophilioidea (vodomilové). 422-424.

GÄRDENFORS, U. (ed.) (2005) *Rödlistade Arter i Sverige*. ISBN 91-88506-30-4. **(S 05)**

GEREND, R. (2003) Vorläufiges Verzeichnis der Wasserkäker Luxemburgs (Coleoptera: Hydradephaga, Hydrophiloidea part., Dryopoidea part., Microsporidae, Hydraenidae, Scirtidae). *Bull Soc. Nat. luxemb.* **104:** 67-78.

HÁJEK J (2004) The distribution of the diving beetles *Dytiscus latissimus* and *Graphoderus bilineatus* (Coleoptera: Dytiscidae) in the Czech Republic. *Klapalekiana* **40:** 13-23 (in Czech with English abstract)

HANSEN, M. (1996) Katalog over Danmarks biller. *Entomologiske Meddelelser* **64** (1, 2): pp. 231.

HYMAN, P.S. and PARSONS, M.S. (1992) *A review of the scarce and threatened Coleoptera of Great Britain, Part 1.* Peterborough, Joint Nature Conservation Committee. (UK Nature Conservation, No. 3).

HYMAN, P.S. and PARSONS, M.S. (1994) *A review of the scarce and threatened Coleoptera of Great Britain, Part 2.* Peterborough, Joint Nature Conservation Committee. (UK Nature Conservation, No. 12).

JÄCH, M.A., DIETRICH, F. and RAUNIG, B. (2005) Rote Liste der Zwergwasserkäfer (Hydraenidae) und Krallenkäfer (Elmidae) Österreichs (Insecta: Coleoptera), pp. 211–284. In: R.M. Zulka (ed) *Rote Listen gefährdeter Tiere Österreichs. Checklisten, Gefährdungsanalyse, Handlungsbedarf. Part 1: Säugetiere, Vögel, Heuschrecken, Wasserkäfer, Netzflügler, Schnabelfliegen, Tagfalter (Grüne Reihe des Lebensministeriums*, Vol. **14**/1). Vienna, Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wirtschaft, 407 pp.

LÖBL, I. and ŠMETANA, A. (eds) (2003) *Catalogue of Palaearctic Coleoptera, Volume 1 Archostemata – Myxophaga – Adephaga*. Apollo Books, Stenstrup.

LÖBL, I. and ŠMETANA, A. (eds) (2004) *Catalogue of Palaearctic Coleoptera, Volume 2 Hydrophiloidea – Histeroidea - Staphylinoidea*. Apollo Books, Stenstrup.

ØDEGAARD, F., ANDERSEN, J., HANSSEN, O., KVAMME, T. and OLBERG, S. 2006. Biller – Coleoptera. In: J A Kålås, Å Viken and T Bakken (eds). *Norsk Rødliste 2006*. Norwegian Biodiversity Information Centre, Trondheim.

PAWŁOWSKI, J., KUBISZ, D. and MAZUR, M. (2002) Coleoptera Chrząszcze. In: Z. Głowaciński (ed.) *Red List of Threatened Animals in Poland*. pp. 88-110. Polish Academy of Sciences, Institute of Nature Conservation, Cracow.

QUENEY, P. (2004) Liste taxonomique des Coléoptères "aquatiques" de la Fauna de France. *Le Coléoptériste* **7** (3): supplément 3-39.

ROTTENBUR,G .T., WIESER, C., MILDNER, P. and HOLZINGER, W. E. (eds) (1999) Rote Listen gefährdeter Tiere Kärntens. Klagenfurt.

SCHEMBRI, P.J. and SULTANA, J. (eds) (1989) Red Data Book for the Maltese Islands. Department of Information, Malta.

SHIRT, D.B., (ed.) (1987) British Red Data Books: 2. Insects. Peterborough, Nature Conservancy Council.

TELNOV, D. (2004) Gyrinidae recorded in Latvia, Lithuania and Estonia**.** *Latissimus* **18:** 21.

Table 6: Summary of species found in Ireland that have some form of Red List status in twelve other European countries. CR, IUCN Critically Endangered; dd, data deficient; EN, IUCN Endangered; Ind, Red Data Book indeterminate; N, Nationally Scarce; Na, Nationally Scarce List A; Nb, Nationally Scarce List B; NE, not evaluated; NT, Near Threatened; R, rare; RE, IUCN Regionally Extinct; VU, IUCN Vulnerable; 0, Red Data Book extinct; 1, Red Data Book, Endangered; 1[0], extinct if Irish cut-off date of 1939 is used; 2, Red Data Book vulnerable; 3, Red Data Book rare. A hyphen (-) indicates where a species is known to occur.

	IRL '08	GB '92	A '05	D '98	Dk '96	Fi '00	Cz '05	Li '03	Lu '03	N '06	NL '92	PL '02	S '05
Bagous glabrirostris (Herbst)	RE	Nb					VU			dd			
Bidessus minutissimus (Germar)	RE	3		V			EX						
Donacia semicuprea Panzer	RE	-								EN			
Helophorus alternans Gené	RE	Na											
Hydraena pulchella Germar	RE	3	NT	2		NT	EN				0		NT
Hydraena pygmaea Waterhouse	RE	3	-	V									
Hydrochus angustatus Germar	RE	Nb		3									
Plateumaris rustica (Kunze)	RE	Nb											
Bagous alismatis (Marsham)	CR	Nb											
Bagous brevis Gyllenhal	CR	1	-	0	-	RE	CR			EN		-	dd
Bagous limosus (Gyllenhal)	CR	Nb	-	3	-	VU	VU			VU	-	-	-
Bagous lutulentus (Gyllenhal)	CR	Nb					NT						
Berosus luridus (L.)	CR	Nb							0				
Hydraena minutissima Stephens	CR	Nb	-								0		
Hygrotus decoratus (Gyllenhal)	CR	Nb											
Plateumaris bracata (Scopoli)	CR	Na											
Agabus conspersus (Marsham)	EN	Nb											
Berosus signaticollis (Charpentier)	EN	Nb											
Enicocerus exsculptus Germar	EN	Nb	VU	3			RE				0		
Haliplus apicalis Thomson	EN	Nb			-			-		VU	-	EN	-
Helophorus arvernicus Mulsant	EN	Nb											
Helophorus granularis (L.)	EN	-											
Hydraena rufipes Curtis	EN	Nb		2									
Hydrocyphon deflexicollis (Müller)	EN	Nb		3			CR						
Hydroporus glabriusculus Aubé	EN	3		1									
Hydroporus longicornis Sharp	EN	Nb		2			VU					EN	
Limnebius nitidus (Marsham)	EN	Nb	EN	3	-	-	EX		-	-			VU
Agabus congener (Thunberg)	VU	-											
Bagous frit (Herbst)	VU	3	-	2	-	-	EN			VU		-	-
Cyphon kongsbergensis Munster	VU	Na		3			VU						
Cyphon punctipennis Sharp	VU	Na		2			VU						
Donacia aquatica (L.)	VU	3											
Donacia cinerea (Herbst)	VU	Nb					EN						
Enochrus halophilus (Bedel)	VU	Na											
Haliplus variegatus (Sturm)	VU	3		2	-	-	CR		0	VU	-	NT	-
Helophorus fulgidicollis Motschulsky	VU	Nb		R						NT			
Helophorus nanus Sturm	VU	Nb											
Helophorus strigifrons Thomson	VU	Nb					NT						
Hydraena nigrita Germar	VU	Nb	-							EN			NT
Hydraena testacea Curtis	VU	Nb					VU			VU			
Hydrochus brevis (Herbst)	VU	3					EN						
Hydroporus morio Aubé	VU	-		2								EN	
Hygrotus novemlineatus (Stephens)	VU	Nb		1									
Hygrotus versicolor (Schaller)	VU	-											

	IRL '08	GB '92	A '05	D '98	Dk '96	Fi '00	Cz '05	Li '03	Lu '03	N '06	NL '92	PL '02	S '05
Ilybius chalconatus (Panzer)	VU	Nb											
Ilybius subaeneus Erichson	VU	Nb											
Laccophilus hyalinus (De Geer)	VU	-											
Ochthebius bicolon Germar	VU	Nb	EN			NT	RE			NT			
Ochthebius nilssoni Hebauer	VU												dd
Agabus arcticus (Paykull)	NT	-											
Agabus labiatus (Brahm)	NT	Nb		2									
Donacia marginata Hoppe	NT	-				VU							
Dryops similaris Bollow	NT	3					EN						
Dytiscus circumcinctus Ahrens	NT	Na		3			NT		0?				
Dytiscus lapponicus Gyllenhal	NT	Na		2						-		VU	
Enochrus melanocephalus (Olivier)	NT	Nb								NT			
Graptodytes bilineatus (Sturm)	NT	3		3		NT	NT						
Gyrinus distinctus Aubé	NT	3		2			EN			NT			
Gyrinus natator L.	NT	1[0]	-	2	-	-	EX	ne		NT	0	-	-
Gyrinus urinator Illiger	NT	Nb		D			EX						
Haliplus lineolatus Mannerheim	NT	-		3									
Hydrochus ignicollis Thomson	NT	3					NT						
Hydroporus obsoletus Aubé	NT	Nb		2									
Hydroporus scalesianus Stephens	NT	2		2			CR						
Laccobius atratus (Rottenberg)	NT	Nb		2									
Laccornis oblongus (Stephens)	NT	3	-	3	-	-	CR			-	-	-	-
Macroplea appendiculata (Panzer)	NT	3		2			RE					CR	
Nebrioporus depressus elegans (Panzer)	NT	-											
Ochthebius auriculatus Rey	NT	Nb		2									NT
Ochthebius marinus (Paykull)	NT	Nb										CR	
Ochthebius viridis Peyron	NT	Nb	NT	2	-		EN				-	-	VU
Oreodytes davisii (Curtis)	NT	Nb		R			CR						
Paracymus scutellaris (Rosenhauer)	NT	Nb		D									
Stictotarsus multilineatus (Falkenström)	NT	Nb											
Augyles maritimus (Guérin-Méneville)	dd	-		3									
Bagous collignensis (Herbst)	dd	3		2	VU	NT							
Bagous lutosus (Gyllenhal)	dd	1		3		VU				NT			
Chaetarthria seminulum (Herbst)	dd	-											
Cyphon palustris Thomson	dd	-											
Donacia dentata Hoppe	dd	Na					EN						
Donacia sparganii Ahrens	dd	Na		3									
Elodes elongata Tournier	dd	Ind		2									
Elodes minuta (L.)	dd	-											
Elodes pseudominuta Klausnitzer	dd	-											
Georissus crenulatus (Rossi)	dd	Na		3			CR			NT		dd	
Heterocerus fenestratus (Thunberg)	dd	-											
Heterocerus flexuosus Stephens	dd	-				VU						dd	
Heterocerus fossor Kiesenwetter	dd	-		0									dd
Heterocerus marginatus (Fab.)	dd	-											
Hydroporus neglectus Schaum	dd	Nb		3						dd			
Hydrovatus clypealis Sharp	dd	Na											
Prionocyphon serricornis (Müller)	dd	Nb		3			VU			VU			
Acilius canaliculatus (Nicolai)	lc	3											
Agabus biguttatus (Olivier)	lc	Nb											
Agabus nebulosus (Forster)	lc	-								VU			
Agabus paludosus (Fab.)	lc	-				VU							
Anacaena globulus (Paykull)	lc	-				VU							

	IRL '08	GB '92	A '05	D '98	Dk '96	Fi '00	Cz '05	Li '03	Lu '03	N '06	NL '92	PL '02	S '05
Brychius elevatus (Panzer)	lc	-					EN			NT		CR	
Cercyon convexiusculus Stephens	lc	Nb											
Cercyon depressus Stephens	lc	Nb				VU							
Cercyon littoralis (Gyllenhal)	lc	-										EN	
Cercyon sternalis Sharp	lc	Nb											
Cercyon tristis (Illiger)	lc	Nb										lc	
Cercyon ustulatus (Preyssler)	lc	Nb											
Cyphon hilaris Nyholm	lc	-		3									
Cyphon pubescens (Fab.)	lc	Nb											
Donacia bicolora Zschach	lc	2											
Donacia clavipes Fab.	lc	Nb											
Donacia crassipes Fab.	lc	Nb					EN						
Donacia impressa Paykull	lc	Na											
Donacia obscura Gyllenhal	lc	Na		3			EN						
Donacia simplex Fab.	lc	-				VU							
Donacia thalassina Germar	lc	Nb											
Donacia versicolorea (Brahm)	lc	-					EN						
Dytiscus circumflexus Fab.	lc	Nb					VU						VU
Dytiscus semisulcatus (Müller)	lc	-	-	2	-		EX	-	-	EN	-	-	-
Enochrus affinis (Thunberg)	lc	Nb							0				
Enochrus bicolor (Fab.)	lc	Nb										EN	
Enochrus ochropterus (Marsham)	lc	Nb											
Esolus parallelepipedus (Müller)	lc	-	-								0		
Graptodytes granularis (L.)	lc	Nb					NT		0				
Gyrinus aeratus Stephens	lc	Nb		3									
Gyrinus caspius Ménétriés	lc	-		2						dd		EN	
Gyrinus marinus Gyllenhal	lc	-		V									
Gyrinus minutus Fab.	lc	Nb	-	1	-	-	EX	-		-	-	-	-
Gyrinus paykulli Ochs	lc	Na	-	V	-	-	EN	-		-	-	-	-
Haliplus confinis Stephens	lc	-		3			EN						
Haliplus fluviatilis Aubé	lc	-				NT							
Haliplus fulvus (Fab.)	lc	-		3			VU						
Haliplus obliquus (Fab.)	lc	-		3						dd			
Helochares punctatus Sharp	lc	Nb											
Helophorus griseus Herbst	lc	Nb								NT			
Hydaticus seminiger (De Geer)	lc	Nb											
Hydraena britteni Joy	lc	-	-	V									
Hydraena gracilis Germar	lc	-	-								0		
Hydraena riparia Kugelann	lc	-	-										
Hydroporus discretus Fairmaire &c	lc	-				NT							
Hydroporus gyllenhalii Schiødte	lc	-				NT							
Hydroporus longulus Mulsant	lc	Nb		3									
Hydroporus obscurus Sturm	lc	-		3					0				
Hydroporus tristis (Paykull)	lc	-							0				
Hygrobia hermanni (Fab.)	lc	-		3								VU	
Hygrotus quinquelineatus (Zetterstedt)	lc	Nb											
Ilybius aenescens Thomson	lc	Nb		3			VU						
Ilybius guttiger (Gyllenhal)	lc	Nb		V						NT			
Ilybius montanus Zimmermann	lc	-		V								VU	
Laccobius colon (Stephens)	lc	-	-	V	-	-	EX		-	NT	-	-	-
Laccobius striatulus (Fab.)	lc	-								NT			
Laccobius ytenensis Sharp	lc	Nb		2						NT	0		
Nebrioporus depressus depressus (Fab.)	lc	Nb											

	IRL '08	GB '92	A '05	D '98	Dk '96	Fi '00	Cz '05	Li '03	Lu '03	N '06	NL '92	PL '02	S '05
Noterus crassicornis (Müller)	lc	Nb											
Ochthebius lejolisii Mulsant & Rey	lc	Nb											
Ochthebius punctatus Stephens	lc	Nb									0		
Oreodytes septentrionalis (Gyllenhal)	lc	-		2			CR						
Rhantus frontalis (Marsham)	lc	Nb											
Rhantus grapii (Gyllenhal)	lc	Nb								NT			
Rhantus suturalis (MacLeay)	lc	Nb								NT			
Rhantus suturellus (Harris)	lc	-	-	3	-	-	NT	-	0	-	-	-	-
Stictonectes lepidus (Olivier)	lc	Nb											
Stictotarsus 12-*pustulatus* (Fab.)	lc	-					NT						