

# **Species Inventory for Northern Ireland**

## **Aquatic Coleoptera**

**Brian Nelson  
Department of Zoology  
Ulster Museum  
BELFAST  
1996**

## **SPECIES INVENTORY FOR NORTHERN IRELAND: AQUATIC COLEOPTERA**

### **Introduction**

This is one of a series of species inventories covering taxonomic or ecological groups of terrestrial and freshwater invertebrates of N. Ireland. These reviews provide an inventory of the N. Irish fauna. These statements will be used as the local species account in the RECORDER database of CEDaR, the N. Ireland Biological Records Centre.

The insect Order Coleoptera is the largest order of insects in terms of the number of recorded species in the British Isles. Within the considerable ecological and physiological variation exhibited by the Coleoptera, there is a small proportion of the species that spend most of their life-cycle in water. These aquatic species are not a monophyletic group, rather they are found in a number of families in both of the two sub-orders, the Adephaga and Polyphaga. Recent publications have differed to some extent as to which species and families are encompassed by the term aquatic. This review takes the families as defined in Appendix 1 in Hyman (1992). A checklist of all the Irish species in these families is given in Appendix 1. Recently the treatment of families has changed since Hyman (e.g. in Foster et al. 1992) and this is followed here. Some species names have also been changed, but to avoid confusion with the nomenclature used in the standard field-guide (Friday 1988) and on the RECORDER version 2.1 database, these have not been adhered to in the checklist, but are referred to in the text.

The Adephaga contain most of the familiar swimming species including the Dytiscidae and Gyridae as well as the Haliplidae, Noteridae and Hygrobiidae. The Polyphaga species are generally associated with wet habitats rather than open water and it is in this group where the definition of aquatic species becomes blurred. The families that contain recognised aquatic species are the Hydrophilidae (*sensu lato*), Hydraenidae, Dryopidae and Elmidae. The Scirtidae are sometimes added to this list. The Chrysomelidae and Curculionidae are predominately terrestrial plant-feeding species, but both families contain a number of species that feed on aquatic or emergent plants. In all the families with aquatic species, no single species spends its whole life in water and normally the pupal stage is spent out of the water. This requirement can clearly have management and conservation implications.

### **Literature and study of the Irish fauna**

The paper by Johnson and Halbert (1901) has been the only complete account written of the Irish Coleoptera fauna, but it is now much outdated though still of great historical value. The most significant publications on the Irish aquatic fauna since this are the paper written by Professor F. Balfour-Browne in 1951 and his three volume treatise on the British Isles fauna (1940, 1950 and 1958). The 1951 paper gives distributional data on the Irish species based on his own extensive collections made during his residence in N. Ireland, as well as collections made by others and the literature records. The distribution data is presented as a list of vice-county occurrences with comments in more detail on individual species. Balfour-Browne was the acknowledged authority on the aquatic Coleoptera in his time and between 1907 and 1913 he was a Lecturer at Queen's University in Belfast. He collected aquatic Coleoptera extensively in N. Ireland but worked mainly in Co. Down. His records were maintained on a card index that still exists but the data has not been fully extracted. Other local entomologists in the first part of the 20th Century recorded the group but it was never a major interest of any of them. The most significant contribution was that of William Crawford who lived in

Belfast but collected in many parts of the north. He published a number of short notes and papers detailing his findings.

Between the late 1930s when Crawford was collecting, until 1988 there was no significant recording effort on the group in N. Ireland. A major effort in recording the group started in this year, initiated by a week long course in Co. Fermanagh, attended by Dr. Garth Foster the national organiser of the recording scheme (Harding 1989). This has resulted in a vast improvement of our knowledge of the distribution of the group in N. Ireland. There has also been an increase in recording in the rest of Ireland since 1986 (Bilton 1988; Bilton and Lott 1991; Foster and Lott; Friday 1987) such that the Irish fauna is now better documented than ever. All the recent Irish data collected up to 1991 has been used in an analysis of the species assemblages (Foster *et al.* 1992). In N. Ireland the bulk of the collecting has been done by Garth Foster (various visits 1988-1991), Brian Nelson (1988 to present working mainly in Co. Fermanagh) and Richard Weyl (1988 to present working mostly in Co. Down). Additional records have been gathered by Roy Anderson and the National Trust Biological Survey Team.

### **Modern Database**

All post 1988 records have been input by Brian Nelson on to the RECORDER database such that a comprehensive database exists based solely on modern records. A formal paper giving details on notable records is planned. Most of the specimens collected during this time have been given to the Ulster Museum.

The current state of our knowledge of the species distribution is good especially in fens, lakes and cutover bogs. The riverine fauna has not been well-covered and this remains one of the biggest gaps in the database. The data in Roberts and Mackie (1993), which has been derived from standardised kick samples, has been incorporated and significantly improved the picture for some of the river species. The geographical coverage is also variable and whilst it is especially good in counties Armagh, Down and Fermanagh, it is noticeably poorer in the remaining three counties. However it has to be said that the fen and lake habitats are much less common in these counties, particularly Londonderry and much of north Antrim.

### **Scope of the review**

This review covers all the species in the following families that have been recorded in N. Ireland: Haliplidae, Noteridae, Dytiscidae, Gyrinidae, Hydrophilidae, Hydraenidae and Elmidae. It is intended to

1. provide a list all the aquatic Coleoptera species recorded from N. Ireland
2. provide in one document a brief statement on the distribution of each species
3. highlight the species distribution within National Nature Reserves (NNRs), Areas of Special Scientific Interest (ASSIs) and on other nature reserves and country parks (this includes National Trust property, and reserves of the RSPB and Ulster Wildlife Trust)

It is also intended the accounts can be used as a basis for the Local Species accounts in the RECORDER package, but providing a hard copy for those who do not have access to this. Maps have not been included as they can easily be produced from RECORDER and in any case as records continue to be accumulated the maps quickly become out of date. This document clearly is also subject to change as information increases. Another focus for this review is that in the event of Irish Red Data books been extended to invertebrate

groups the information is available in this document to assist in the selection of the RDB species.

### **Identification of Irish species**

Friday (1988) provides the most comprehensive and up-to-date keys for the Irish fauna. More detailed keys for the Gyrinidae, Haliplidae, and Noteridae are found in Holmen (1987). Hansen (1987) covers the Hydrophiloidea but does not include all the Irish species. Additional information and alternative keys are given in Balfour-Browne's three volumes on the group. These however should be used with caution due to the many changes in nomenclature and taxonomic definitions, and additions of a number of species to the British Isles fauna.

### **Comparison with other regions**

Table 1 gives comparative figures of the fauna of Ireland, GB and Scotland. The Irish fauna is like most groups impoverished compared to GB. The figure at 70% is higher than many other groups and indicates the relative richness of the freshwater fauna in Ireland. Impoverishment is most noticeable in terms of species numbers in the Dytiscidae, and proportionately in the Elmidae.

The proportion of the Irish fauna found in N. Ireland is 87.5% that indicates relatively little variation in the freshwater fauna across the whole island. In comparison to Scotland the N. Irish fauna appears very similar across most families despite the geographical differences between the two areas.

Appendix 2 lists all species that have been recorded from N. Ireland. It gives the RDB status based on its status Gt. Britain and denotes whether the species is present in any of the three categories of protected sites. The GB RDB statuses clearly are not directly applicable to N. Ireland, or Ireland as a whole, but a comparison of them may assist in assigning species to a RDB category. However there are records of only 9 of the 60 RDB species from N. Ireland and several of these are relatively frequent here. It would appear that there is going to be little in common between any future Irish list and the existing GB one. This may be because the GB list of RDB species is dominated by southern, thermophilous species and a similar low representation of RDB species is noticeable in the Scottish fauna (Foster 1994).

### **Representation within protected sites**

Table 2 shows the breakdown of the species in each abundance category and the occurrence of these species in each of the protected sites. Of the species recorded since 1988 only 7 species are not known to be present in any type of nature reserve or ASSI. Of these species, five are associated with running water, one is a brackish-water species and the last is found in bogs and upland pools. The NNR total at just over 50% of the fauna is due to the diverse rich fen fauna recorded at Brackagh Bog. Relatively little aquatic habitat is found in other NNRs, and the fauna of lowland rivers, acid cutover bogs and small lakes is poorly represented. The Cladagh River within the Marble Arch NNR, however supports the best riverine fauna so far documented in N. Ireland. The ASSI system in N. Ireland now covers a wide range of the habitats in the province and

consequently much of the fauna. Rivers are however very poorly represented in the present suite of sites. Important species assemblages are found in the following ASSIs:

1. Upper Lough Erne - rich fen and open water species
2. Derryleckagh - fen fauna
3. Garron Plateau - upland lake species
4. Mourmes - fauna of upland lakes and flushes
5. Strangford Lough - brackish fauna

	Ireland	N. Ireland	GB	Scotland
Haliplidae	13	13	18	12
Noteridae	2	2	2	2
Hygrobiidae	1	0	1	0
Dytiscidae	80	73	114	83
Gyrinidae	10	10	12	9
Georissidae	1	0	1	0
Hydrochidae	3	2	7	1
Helophoridae	13	11	20	15
Hydrophilidae	26	21	38	21
Hydraenidae	23	18	30	19
Elmidae	4	4	12	7
TOTAL	176	154	255	169

**TABLE 1:** Comparison of the aquatic Coleoptera faunas of different regions within British Isles

NUMBER OF SPECIES PER CATEGORY					
	TOTAL	ASSI	NNR	LNR	NONE
A	10	5	2	3	2
B	22	14	6	7	5
C	54	51	19	25	1
D	34	34	31	25	0
E	16	15	15	15	1
F	5	5	5	5	0
X	13	na	na	na	na
TOTAL	154	124	78	80	9

**TABLE 2:** Representation of species within protected sites

## SPECIES ACCOUNTS

The writing of local species accounts in the present exercise serves to define current knowledge as a prelude to designation of species within RDB classes. The following accounts are arranged in systematic order. For each species the number of sites at which it has been recorded since 1988 is denoted by a letter on the first line of each account according to the following categories:

A: 1 site; B: 2-5; C: 6-20; D: 21-50; E: 51-100; F: 100+; X: not recorded recently.

County names have been abbreviated to AN (Antrim), AR (Armagh), DO (Down), FE (Fermanagh), LD (Londonderry) and TY (Tyrone). These refer, unless stated otherwise, to the political counties. These differ from the biological vice-counties used in Balfour-Browne (1951) in that the portion of Londonderry to the west of the River Foyle is included in the vice-county of East Donegal.

### HALIPLIDAE

This is a family containing small superficially similar species generally with pale elytra with varying degrees of dark markings. They are open water species that swim characteristically by moving the legs alternately. They are all herbivorous and feed particularly on algae. There are records of 13 species in Ireland all of which have been recorded from N. Ireland.

#### ***Brychius elevatus* (Panzer 1793)**

**C**

This is a riverine species found in moderate flowing stretches of rivers. It appears to be very locally distributed with most records from the Foyle catchment and scattered records from the other major river systems. However as rivers are a under-recorded habitat, the species may prove to be more widespread and common than the records suggest.

#### ***Haliphus apicalis* Thomson, 1868**

**B**

A saltmarsh species that is tolerant of moderate salinity. In Britain *H. apicalis* has a south-eastern distribution and it appears to have declined in the north of its range and become extinct in Scotland (Foster 1994). In Ireland the only modern records are from Belfast Lough and Strand Lough Killough, DO, though it previously has been recorded in Co. Wexford (Foster 1981). The recent records are from pools in reclaimed estuarine ground and it is clearly under continuing threat of habitat loss.

#### ***Haliphus confinis* Stephens, 1828**

**C**

Uncommon, found in scattered sites principally in AR and DO but also FE and AN. There appear to be no records from LD or TY. The majority of the records are from pools in cutover bogs and fens with a few records from mesotrophic lakes and artificial ponds. This species shows an association with charophytes on which the larvae feed (Holmen 1987).

#### ***Haliphus flavicollis* Sturm, 1834**

**C**

This is a pond and lake species that occasionally can be found in running water. No obvious habitat association is apparent in N. Ireland. Records come from all counties though there are no post-1988 records from LD or TY.

#### ***Haliphus fluviatilis* Aubé, 1836**

**B**

Apparently rare but this is mainly a riverine species that may be very under-recorded. It can also occur in drains and disused canals and occasionally lakes. According to Balfour-Browne (1951) this species has a widespread distribution in N. Ireland, and recorded from all counties except FE. However, the only recent records have been from two lowland rivers in AR and disused stretches of canal connected to them.

#### ***Haliphus fulvus* (Fabricius, 1801)**

**C**

A widespread but local species that is found principally in deep pools and small lakes often in upland areas. There are recent records from all counties except LD.

***Haliphus immaculatus* Gerhardt, 1877** **C**  
An uncommon species, *H. immaculatus* occurs in brackish and base-rich waters. In N. Ireland the few records include brackish coastal sites in DO and a marl lake in FE. There is a cluster of records from ponds on the shores of Lough Neagh.

***Haliphus lineatocollis* (Marsham, 1802)** **D**  
One of the commonest haliplids this species is found especially in rivers and streams, and to a lesser extent in still waters, throughout N. Ireland.

***Haliphus lineolatus* Mannerheim, 1844** **C**  
This is a lake species typically found in clear, unpolluted lakes. Apart from a single AN and two DO sites, all recent records are from FE where it is widespread but local. There are no published or recent records from AR, TY and LD.

***Haliphus obliquus* (Fabricius, 1787)** **C**  
Uncommon. A *Chara* feeding species found in base-rich pools and lakes. It is very local occurring in natural marl type lakes and a turlough in FE and flooded quarries and lakes in DO and AR.

***Haliphus ruficollis* (DeGeer, 1774)** **E**  
This is the commonest species of *Haliphus* in N. Ireland, as it is in the rest of Britain and Ireland. It is found in a wide variety of lowland still waters including lakes and ponds and occasionally in rivers. Whilst it is very common in the south of the province, there are very few records north of Lough Neagh.

***Haliphus variegatus* Sturm, 1834** **A**  
Very rare. There is only one recent record from a shallow pool at Brackagh Bog NNR, AR, an area where it has previously been recorded (Balfour-Browne 1951). Rare elsewhere in Ireland and Britain where it has been given RDB3 status and there is evidence of a serious decline (Foster 1981).

***Haliphus wehnckeii* Gerhardt, 1877** **D**  
This is a common species, found most frequently in rivers but also small lakes throughout N. Ireland.

## **NOTERIDAE**

This family is represented by just two species in Ireland. They are streamlined, brownish beetles that live in open water and in open fens. Old records are unreliable unless accompanied by vouchers due to the confusion over nomenclature.

***Noterus clavicornis* (DeGeer, 1774)** **E**  
*N. clavicornis* is the larger and most common of the two *Noterus* species. It is especially common in the interdrumlin fens of DO. In the west it is found in lakeside fens. It is recorded from all counties. This is a locally distributed species in Britain and appears to be more generally distributed in Ireland.

***Noterus crassicornis* (Müller, 1776)** **D**  
This is locally common within its restricted range, inhabiting open water in fen pools and mesotrophic lakes. The majority of records are from fens around Upper Lough Erne and the Lough Neagh wetlands. It is however noticeably absent from the DO interdrumlin fens. Like its larger relative, *N. crassicornis* is commoner in Ireland than in Britain. It is a flightless species considered indicative of undisturbed sites.

## DYTISCIDAE

The Dytiscidae is the largest family of the aquatic Coleoptera. The species range in size from under 2mm to nearly 40mm but in general appearance and shape they differ little with smooth streamlined shape and hind legs modified for swimming. Many of the species occur in mossy wet areas rather than in open water. Eighty-one species are recorded from the whole of Ireland and 73 in N. Ireland.

### ***Laccophilus hyalinus* (DeGeer, 1774)**

**X**

There are old records for this species from AR and AN (Balfour-Browne 1951), but no recent ones from anywhere in N. Ireland. It has a lowland south-eastern distribution in Britain where it is found in slow-running water. Lack of sampling in its habitat may account for the lack of records.

### ***Laccophilus minutus* (Linnaeus, 1758)**

**D**

A common species of open water in lowland lakes and large ponds. Found in all counties.

### ***Hyphydrus ovatus* (Linnaeus, 1761)**

**D**

This is a very distinctive water beetle unlike any other species found in Ireland. It is a common species in the lowland eutrophic lakes and large ponds in fens and cutover bogs. It is most frequent in the east but has been found in all counties.

### ***Hygrotus inaequalis* (Fabricius, 1777)**

**E**

A widespread and often abundant species in ponds and small lakes throughout lowland areas becoming much less common in upland areas. It has been recorded in all counties and also on Rathlin Island.

### ***Hygrotus quinquelineatus* (Zetterstedt, 1828)**

**D**

This species is characteristic of and common in the large FE lakes. It is also locally frequent in eastern DO in artificial sites around Strangford Lough and on the Ards peninsula. There are just scattered records from all the other counties apart from AN, although it has been recorded from here in the past (Balfour-Browne 1951). *H. quinquelineatus* is found in larger water bodies than *H. inaequalis* and seems to require productive or base-rich waters. It is found throughout Ireland, whereas in Britain this species has declined in parts of its limited range and is now confined to southern and eastern Scotland (Foster 1994).

### ***Coelambus confluens* (Fabricius, 1787)**

**B**

A pioneer species and a rapid coloniser of newly created sites, but is also tolerant of considerable eutrophication. It is however a rare species in Ireland and its habitat is not common and has not received much attention from recorders. There are only two confirmed recent records from N. Ireland from a highly eutrophic lough and a flooded sandpit, both in DO. There are no published records from other counties.

### ***Coelambus impressopunctatus* (Schaller, 1783)**

**C**

Very local but can be common at individual sites. Previous records have been from coastal sites, both freshwater and brackish lagoons (Balfour-Browne 1940) but modern records have extended its distribution to include inland lakes in AN and FE. This pattern is apparent in Britain (Foster 1981) where it is as common inland as in coastal localities.

### ***Coelambus novemlineatus* (Stephens, 1829)**

**A**

A lake species which in Britain has a modern northern distribution and is largely confined to Scotland. It inhabits clean lakes with sandy beds and has died out in southern parts of its range (Foster 1981). There is only one recent N. Irish record from Lough Beg, LD. The only other post-1950 records are from three lakes in Co. Clare (Lansbury 1965) and one lake in Co. Mayo (Foster and Lott 1988). Balfour-Browne (1951) lists the species



from 10 vice-counties, including AR, DO and AN. This suggests the possibility that *C. novemlineatus* has declined, mirroring the trend that can be seen in Britain.

***Hydroporus angustatus* Sturm, 1835**

**D**

Common in suitable habitat, recorded in all counties. A characteristic species of eutrophic fens *H. angustatus* is especially frequent in the inter-drumlin mires in the south-east but is much more local in the north and west where this habitat is less common.

***Hydroporus discretus* Fairmaire, 1859**

**B**

Apparently rare, with well-scattered post-1988 records in AN, AR and FE and pre-88 records for LD and DO (Balfour-Browne 1951). *H. discretus* is found in springs and muddy streams and does not appear to be common elsewhere in Ireland. It occurs throughout Britain but is considered a local species in most areas (Foster 1984).

***Hydroporus erythrocephalus* (Linnaeus, 1758)**

**E**

Common and widespread in a wide variety of still, permanent water in fens and bogs and small lakes. Found in all counties.

***Hydroporus glabriusculus* Aubè, 1938**

**A**

Bilton (1988) recorded this species for the first time in Ireland in the Mullingar area. It inhabits mesotrophic fens and is considered a post-glacial relict. It is rare in most of its range due to pollution and habitat loss. The first N. Irish site was found by Richard Weyl in the Finn catchment in SE Fermanagh.

***Hydroporus gyllenhali* Schiodte, 1841**

**E**

A common and widespread species found in acid pools, poor fens and small lakes throughout N. Ireland.

***Hydroporus incognitus* Sharp, 1869**

**C**

Typically found in acid pools in woodland or the edges of bogs. Apparently uncommon though recorded from all six counties and with most records from the north and west.

***Hydroporus longulus* Mulsant, 1860**

**B**

Rare. Inhabits seepages and flushes in upland areas. There have been only three post-88 records, from two sites in the Mourmes (DO) and one in north AN. This is despite intensive survey of its habitat in the Mourmes in 1994. *H. longulus* has been recorded in the past from both LD and AR (Balfour-Browne 1951).

***Hydroporus melanarius* Sturm, 1835**

**C**

Uncommon, predominately an upland species found in shallow seepages and pools. As in Britain, *H. melanarius* is also found occasionally in lowland habitats in heathland and woodland pools, which provide the acid conditions it requires. The recent records are all in the north and west in AN, LD, TY and FE apart from one site in the Mourmes, DO. There appear to be no recent or previously published records from AR. These N. Irish records are the only post-88 Irish records. The only additional records are from the south-western vice-counties of North Kerry, South Kerry and West Cork (Balfour-Browne 1951).

***Hydroporus memnonius* Nicolai, 1822**

**D**

Found in shallow pools in woodland, bogs, fens and brackish pools. Whilst this is never a common species it is found at many sites and has a wide distribution across the whole of N. Ireland.

***Hydroporus morio* Aubé, 1838**

**B**

Rare; an upland species found in small peaty pools. Only a few recent records from the major uplands in the Sperrins (TY), Garron plateau (AN) and the Mourmes (DO). Whilst there have been few other Irish records the published records indicate that *H. morio* has been recorded in most of the major upland areas. The recent surveys suggest it is, like

*Potamonectes griseostriatus* and *Dytiscus lapponicus*, restricted to just one or two sites in each of these upland blocks.

***Hydroporus nigrita* (Fabricius, 1792)**

**D**

Shallow usually acid pools are the main habitat of *H. nigrita* and in Britain it is commonest in the north and west and in upland areas. However relict lowland populations still exist in the heaths of southern England (Foster 1984). Within Northern Ireland this geographical pattern is not apparent as there are as many records from lowland cutover bogs as there are from upland pools. It is found in all counties.

***Hydroporus obscurus* Sturm, 1835**

**E**

This is considered an acidophile species that is common in acid bogs in both lowland and uplands in all counties. It is however recorded from non-acid sites in the centre and west of Ireland (Bilton and Lott 1991; Foster and Lott 1988) but has not been found in such sites here.

***Hydroporus obsoletus* Aubé, 1938**

**B**

Whilst this is a distinctive species it is an elusive insect that is believed to be largely a subterranean species. It is found in acid springs though individuals can appear elsewhere after heavy rain. The list in Balfour-Browne (1951) gives vice counties LD, AN, DO and North Kerry as being the only ones from which it has been recorded. Recent records have added little to this. The nature of its habitat and ecology mean this species is difficult to detect and its true status is unclear. There are three recent records from the north (one each in AN, AR and DO) and one from Tipperary (Bilton and Lott 1991).

***Hydroporus palustris* (Linnaeus, 1761)**

**F**

Widespread and very common species in a variety of lowland habitats. Recorded from all counties and on Rathlin Island.

***Hydroporus planus* (Fabricius, 1781)**

**D**

A widespread and common species of lakes and ponds throughout the lowlands and in all counties.

***Hydroporus pubescens* (Gyllenhal, 1808)**

**F**

This is one of the commonest Irish water beetles. It is found in all counties, in a variety of still waters from sea level to 475m.

***Hydroporus scalesianus* Stephens, 1828**

**C**

This the smallest Irish *Hydroporus* is restricted to mossy carpets in undisturbed fens. It can survive in very small sites (Foster 1984) and has been recorded from such in N. Ireland. Whilst not a major rarity this is considered a good indicator species of intact sites. The first Irish records were in 1986 at two sites in Co. Westmeath (Bilton 1988) and subsequently it has been found in Co. Limerick (Bilton and Lott 1991). The 8 northern sites significantly increase the number of known sites and range for *H. scalesianus*. It has been found in FE, AR and DO in mossy carpets in mires or lake basins.

***Hydroporus striola* (Gyllenhal, 1827)**

**D**

A typical and widespread fen species, which is most commonly recorded in DO and AR. It is apparently very rare in LD, AN, and TY, but this is probably due to lack of suitable habitat in these counties.

***Hydroporus tessellatus* Drapiez, 1819**

**E**

A common and widespread species of shallow ponds and fens recorded in all counties. *H. tessellatus* can also be found in brackish pools and occasionally running water. It is suggested by Foster (1984) that its distribution is limited by winter temperature but there are records in N. Ireland for upland sites in the west.

***Hydroporus tristis* (Paykull, 1798)**

**D**

A common species of acid pools and poor fens in upland areas and also lowland peat bogs. It is found in suitable habitat throughout the province.

***Hydroporus umbrosus* (Gyllenhal, 1808) D**

A species of productive fens found in lowland regions. Overwhelmingly an eastern species and very frequent in the DO and AR interdrumlin wetlands, with only scattered records from the other four counties.

***Suphrodytes dorsalis* (Fabricius, 1787) C**

Found in fen pools, where it is tolerant of heavy shading, *S. dorsalis* has been recorded at all the large eastern fen and cutover bog sites. It is much rarer in the west and north due to the lack of suitable habitat. Here the few records have been from fen pools by small lakes.

***Stictonectes lepidus* (Olivier, 1795) C**

Local, but distributed across the whole of the province. Found in artificial sites such as quarry pools but also natural pools in peat hags and cutover bogs. Sites are typically oligotrophic waters and usually devoid of vegetation.

***Graptodytes granularis* (Linnaeus, 1767) C**

A species of poor fens and bogs, and occasionally lake margins, where it is found amongst permanently wet moss carpets. It is only found in the north and west and is absent from the DO and AR fens, underlining the preference for base-poor conditions. In Britain *G. granularis* is only common in East Anglia and appears to have declined in much of its range (Foster 1983).

***Graptodytes pictus* (Fabricius, 1787) C**

This is the commonest and most widespread member of the genus in Britain and also in N. Ireland. A species of open water of large pools and small lakes in scattered localities in all counties with no obvious geographical pattern. The map in Foster (1983) indicates a coastal distribution throughout Ireland that is not borne out by modern records and must be an artefact of recording effort.

***Porhydrus lineatus* (Fabricius, 1775) C**

In Britain *P. lineatus* has a widespread but mainly southern and lowland distribution that has been lost from parts of the English Midlands. It is found in well-vegetated eutrophic lakes, ponds and drains. The N. Irish records show it be relatively uncommon with most records from the lakes in FE and eastern DO. There are single recent records from all other counties.

***Potamonectes assimilis* (Paykull, 1798) C**

*P. assimilis* and the next species are correctly in the genus *Nebrioporus*. This is a northern species of clear lakes, drains and occasionally streams. Most of the N. Irish records are from small mesotrophic lakes in FE and TY. The few records in the east are from large pools on cutover bogs in AR, AN and DO.

***Potamonectes depressus* (Fabricius, 1775) D**

The main habitat of this species is rivers and it is common in suitable rivers in the west (Roberts and Mackie 1993). It can also be found in small lakes. A northern and western spread of the records is apparent, but like all riverine species this may be due to lack of recording effort in its main habitat. *P. depressus* occurs in two forms (which can hybridise), *P. d. depressus* (Fabricius) and *P. d. elegans* (Panzer). The type form is the only one found in Ireland. In Britain it occurs commonly in northern Scotland with a few isolated populations in ancient lakes south to the Lake District (Foster 1994; Balfour-Browne 1940).

***Potamonectes griseostriatus* (DeGeer, 1774) C**

Correctly this species is now known as *Stictotarsus griseostriatus*. This is one of the upland beetles that is present in lakes in all the major upland areas of the Garron (3

sites), Moumes (3 sites) and single sites in the Sperrins LD/TY, Slieve Beagh TY and Cuilcagh FE. At many of these sites it was noted as being abundant and often associated with *Dytiscus lapponicus* or the heteropteran *Glaenocoris propinqua* (Fieber). AR is the only county it is not recorded from and there appears to be very little potential habitat that may be suitable for it. The other Irish records are from counties Waterford, Mayo and Wicklow (Foster and Lott 1989).

***Stictotarsus duodecimpustulatus* (Fabricius, 11775) C**

This is a strikingly marked species found in clean stretches of rivers and streams. The available records show a scattered distribution with no obvious pattern. It does not appear to be a common species, but some degree of under-recording is likely as it is a riverine species. There are no recent or published records for FE.

***Oreodytes davisii* (Curtis, 1831) B**

Rare, restricted to single rivers in the Moumes and Sperrins, LD, where it has been collected in upland rivers with fine beds of shingle. There are old records for AR and AN (Balfour-Browne 1951; Crawford 1934). Elsewhere in Ireland it is only known from Donegal, Dublin and Wicklow but there are no recent records from these areas. The British distribution is also a northern and upland one (Foster 1983).

***Oreodytes sanmarki* (Sahlberg, 1826) D**

This is the commonest member of the genus and like the others it is found in clean rivers and streams, with beds of shingle and moderate flow. Roberts and Mackie (1993) found it in most of the rivers surveyed especially in the north and west in TY, LD and AN. In contrast there are no recent records for AR and only one from FE. The only recent DO records are from rivers flowing off the Moumes.

***Oreodytes septentrionalis* (Sahlberg, 1824) C**

Whilst differing in detail the broad distribution in N. Ireland of *O. septentrionalis* and *O. sanmarki* are similar and the two species were frequently found at the same site. The major differences are the absence of *O. septentrionalis* from the northern rivers in the Foyle system in LD and its presence in suitable stretches of the Upper Bann in AR and the Blackwater on the AR/TY border. There are as yet no records from FE.

***Laccornis oblongus* (Stephens, 1835) C**

A flightless relict fen species. Within a restricted area of central AR and west DO *L. oblongus* is present at many interdrumlin fens. These sites are typically lacking open water and the beetle has been found in wet moss carpets particularly around clumps of sedges. There is a single record outside these two counties in south-eastern FE. Prior to 1986 there was only one record from Ireland from Co. Meath (Balfour-Browne 1940; not Co. Westmeath as stated in Balfour-Browne 1951). Bilton (1988) rediscovered it in fens around Mullingar, Co. Westmeath and subsequently it has been collected at one site in Co. Limerick (Bilton and Lott 1991). The British distribution is also strongly clumped in the Scottish Border mosses and East Anglian Brecks, with just a few other records (Foster 1983). The N. Irish sites represent one of the major concentrations of this species in the British Isles.

***Agabus affinis* (Paykull, 1798) D**

This is one of the characteristic species of moss carpets in lowland fens and bogs. The N. Irish distribution shows a concentration of records in AR and DO where it is very common in the interdrumlin fens. In the north and west these fens are much less common and *A. affinis* is correspondingly more locally distributed in poor fens beside lakes and cutover bogs.

***Agabus arcticus* (Paykull, 1798) C**

This is one of four dytiscid species that inhabit upland pools and lakes. Despite its absence from some areas it is the most common and widespread of these species. The distribution extends from the Garron Plateau south-east through the Sperrins in LD and

TY to Cuilcagh in FE and Slieve Beagh, TY. The majority of the sites are small mesotrophic to oligotrophic lakes between 175m and 475m. It is unaccountably absent from the Moumes, a situation noted by Balfour-Browne (1950), and confirmed by a recent survey of all the lakes. The only other Irish counties in which it has been collected are Wicklow, where it can still be found (Foster and Lott 1988), and Galway (Walton 1967).

***Agabus biguttatus* (Olivier, 1795)**

**B**

This elusive species leads a subterranean life amongst gravel at the beds of streams and in springs. Heavy rain can flush it into other habitats. In Britain it is widespread but uncommon and most frequently found in limestone districts. However it is not confined to base-rich waters. It appears to be rare in Ireland but it is a species that requires special effort in recording it. There are old Irish records from counties AR, Dublin and Kerry (Balfour-Browne 1950). The only records since then are one from Boho cave FE in 1966 (Harding 1989) and at a single site in north AN.

***Agabus bipustulatus* (Linnaeus, 1767)**

**F**

Abundant, very widespread and the commonest medium-sized dytiscid. It can be found from sea-level to some of the highest pools surveyed in the Moumes at almost 500m.

***Agabus chalconatus* (Panzer, 1796)**

**B**

This species is closely related to *A. melanocornis* and until recently both were usually regarded as forms of the same species (Balfour-Browne 1950). They can only be separated by differences in the males. All the old Irish records refer to *A. melanocornis* and the only confirmed records of this species are the recent ones from the Crom Estate FE and Argory Moss AR. It has been collected at these sites in woodland pools, a drying out fen and a cutover-bog. In Britain *A. chalconatus* is the rarer of the two and is a southern species that is absent from Scotland.

***Agabus congener* (Thunberg, 1794)**

**C**

In Britain this is a northern species found in peaty pools. It is very rare in southern England and Wales. Whilst it does occur predominately in upland areas, it can be found at sea-level if there is suitable habitat (Balfour-Browne 1950). There is only one pre-1950 record from the Mweelrea Mountains, Co. Mayo. Since 1988 it has been found in six sites N. Ireland in AR, AN, DO and LD in lowland poor fens and cutover bogs. The only other Irish record is a recent one from a lowland raised bog in Co. Offaly (Foster and Lott 1989).

***Agabus conspersus* (Marsham, 1802)**

**X**

A brackish water species for which there is an old record from DO (Balfour-Browne 1950). There is only one recent Irish record but pre-1950 records exist for most coastal counties in the east and south and from Co. Clare in the west.

***Agabus guttatus* (Paykull, 1798)**

**C**

*A. guttatus* is typically, but not exclusively, found in flowing water associated with seepages and springs in hilly districts. Balfour-Browne (1950) considered it to be an uncommon species in Ireland but recent records show it to be a widespread and locally frequent species in suitable habitat in all upland areas in NI, especially in the Moumes and the AN hills. There is also one record from a woodland pond at Crom, FE. AR is the only county in which there has not been a recent record.

***Agabus melanocornis* Zimmermann, 1919**

**C**

The correct name for this species is *A. montanus* (Stephens)(Foster 1994). It is very closely related to *A. chalconatus* and has not always been considered a separate species. In the British Isles this is the commoner of the two *chalconatus* group species

and this holds true in NI. Here it is a widespread but very local species of mossy drains, fens and bogs. There are records from all counties except FE with most in DO and LD.

***Agabus nebulosus* (Forster, 1771)**

**C**

This species is a rapid coloniser of artificial pools such as clay pits and flooded quarries. Natural sites occupied include coastal freshwater pools and shallow clear lakes with sandy or gravelly bottoms. In NI it has been collected in all types of sites but it cannot be considered a common species. The recent records are well scattered, with no apparent pattern, through all counties except AR.

***Agabus paludosus* (Fabricius, 1801)**

**C**

This species is found in running water especially vegetated small streams, but not large rivers nor still waters except as stray individuals. Where its specific habitat requirements are met this is a common species recorded from in all counties.

***Agabus sturmii* (Gyllenhal, 1808)**

**E**

A common and widespread beetle of eutrophic and mesotrophic fens especially associated with small lakes across the southern part of NI. It is less frequent north of Lough Neagh.

***Agabus unguicularis* Thomson, 1867**

**D**

*A. unguicularis* is found in mossy fens and drains in similar situations and often with *A. affinis*. The distribution of the two species is very similar with a predominance of records from the south-eastern interdrumlin wetlands in AR and DO, but many fewer records in the western and northern counties.

***Ilybius aenescens* Thomson, 1870**

**D**

A classic acidophile species that is found in pools on lowland cutover bogs and also in upland bogs and peaty lakes. In the south-east it is confined to the acid cutover bogs especially around Lough Neagh and sites in the Moumes. In the north and west *I. aenescens* is common in the west FE uplands and the Sperrins. There are no records from the AN uplands though suitable habitat does exist.

***Ilybius ater* (DeGeer, 1774)**

**D**

This species the largest *Ilybius*, is found in eutrophic lakes and ponds especially in FE and DO. There are only a few records from the other counties. It has been collected on Rathlin Island, AN.

***Ilybius fuliginosus* (Fabricius, 1792)**

**E**

Common and generally distributed throughout the lowlands in lakes and ponds and rarely slow-flowing water, but not infrequently in mesotrophic upland lakes. Recorded from all counties.

***Ilybius guttiger* (Gyllenhal, 1808)**

**D**

This is the lowland fen counterpart of *I. aenescens*. Balfour-Browne (1951) considered the few old records to be misidentified examples of *I. aenescens* and he did not include it in his Irish list. Recent records have shown *I. guttiger* to be common in N. Ireland where it is one of the characteristic species of the rich fen beetle community (type G of Foster *et al.* 1992). The distribution of the two species shows the habitat difference clearly as there is virtually no overlap. *I. guttiger* is found very frequently in the AR and DO fens and also in FE, but is absent from all upland areas. This is a local species in Britain (Foster 1983) and like several fen species, the N. Irish sites represent one of its main concentrations.

***Ilybius quadriguttatus* (Lacordaire, 1835)**

**D**

An inhabitant of eutrophic lowland fens that is common and widespread in south FE, AR and DO but much less common to the north of Lough Neagh presumably due to the lack of suitable habitat.

***Ilybius subaeneus* Erichson, 1837**

**A**

A species found in small natural ponds but also artificial sites especially flooded clay pits. It is not common in Britain but the records suggest it has increased as suitable habitat has been created. The only Irish record is from the flooded clay pits at Glastry DO where it was first collected in 1990.

***Rhantus exsoletus* (Forster, 1771)**

**E**

Mesotrophic lakes and large ponds with *Carex rostrata* fen account for most of the modern records of this relatively common species. It is most common in the mesotrophic lakes in FE and frequent in the other counties apart from AN. There are only two AN records, one in the extreme south of the county, and one on Rathlin Island.

***Rhantus frontalis* (Marsham, 1802)**

**C**

The recent records show this species recorded in seven sites, of which five are in DO and two in FE. AR is the only other county in N. Ireland in which it has been recorded (Balfour-Browne 1950). The sites are varied in character ranging from a shallow brackish pool in reclaimed estuarine ground, to fen pools and shallow base-rich lakes. There are a number of other widely scattered Irish records. In Britain it has a disjunct distribution in central Scotland and southern England.

***Rhantus grapii* (Gyllenhal, 1808)**

**C**

There are only two pre-1950 Irish records of *R. grapii* from Cos. Wexford and Dublin (Balfour-Browne 1951). Modern records reveal it not to be such a rare species as previously thought. It is a characteristic but uncommon species of rich fens, which in N. Ireland is found in the large fen systems in the east and also a single fen in FE. Other recorders have collected it in scattered sites in the central Irish fens and most recently in Kerry (Foster 1995).

***Rhantus suturalis* (Macleay, 1825)**

**X**

Crawford (1937) added this species (formerly known as *R. pulverosus* Stephens) to the Irish list based on specimens collected in 'the pools on the broken ground near the King's Bridge, Belfast on the DO side of the Lagan'. In the space of three visits between October and December 1936 a total of 5 specimens were collected. This area is developed and so the pools no longer exist. There have been no other Irish records. *R. suturalis* is a highly mobile species and the possibility that this record was due to a temporary influx should be borne in mind. In Britain this species is most common in the south-east, with a scattering of records in the north and west, including Ireland. These temporary populations are probably dependent on sporadic northward movements in warm years (Foster 1985).

***Rhantus suturellus* (Harris, 1828)**

**C**

This is an upland peatland species that is also found in a few lowland fens in DO. The upland distribution includes a single lake in the Sperrins, two in the Garron Plateau and in the Moumes. A similar disjunct pattern is apparent over Britain, but whereas it is still common in the north, it is extinct in most of the lowland peatland sites (Foster 1983). There are no records from FE and AR. The published records indicate a wide distribution in Ireland apart from much of the central lowlands (Balfour-Browne 1950).

***Colymbetes fuscus* (Linnaeus, 1758)**

**D**

A common lake species also found in large ponds including brackish sites. Widespread in lowland areas of FE and eastern DO, but much less common in all other counties. The only LD and AN records are from coastal pools.

***Hydaticus seminiger* (DeGeer, 1774)**

**C**

A characteristic species of the best examples of mossy fens, which shows a similar distribution to *Acilius canaliculatus*. In common with other notable fen species, there is a cluster of records in central DO and the Lough Neagh peatlands, with two outlying localities in south FE. Elsewhere in Ireland it is found in fens in central Ireland and a

single site in Kerry. The latter was the only pre-1950 Irish record (Balfour-Browne 1951). In Britain *H. seminiger* is confined to SE England and East Anglia.

***Acilius canaliculatus* (Nicolai, 1822)**

**C**

In N. Ireland and parts of England this large dytiscid inhabits pools in fens and cutover bogs particularly the less acid examples. There are also records from exposed montane lochans in Scotland, and the record from Sallagh Braes, AN, appears to be the only N. Ireland record from a site of that type (Balfour-Browne 1950). There appear to be no records from LD. *A. canaliculatus* is locally frequent in the DO interdrumlin fens, and more locally, extending west through the Lough Neagh fens to a scattering of sites in south TY and a single site in south-eastern FE. This is considered a Red Data Book species in Britain, due to a decline in some parts of its highly localised and disjunct range.

***Acilius sulcatus* (Linnaeus, 1758)**

**C**

This is an uncommon species found in small base-poor lakes and pools on cutover bogs mostly in the north and west. The distribution extends to Rathlin Island, AN. There are no recent records from DO. The literature presents a confusing picture as to the old records. The vice-county list in Balfour-Browne (1951) list no records from N. Ireland, but the map in his 1950 book indicates a very wide Irish distribution including all N. Irish counties except for TY. In Britain this is the commonest of the two *Acilius* species a situation that appears to be reversed in N. Ireland.

***Dytiscus circumcinctus* Ahrens, 1811**

**B**

Rare; found in lowland fens and pools on Upper Lough Erne in FE and single sites in counties AR and AN. It has previously been collected in DO (Balfour-Browne 1950). The only other Irish records are from Co. Cavan (Balfour-Browne 1950), and recently one site in Co. Westmeath (Bilton 1989). It is one of the rarer *Dytiscus* species in Britain though said to be relatively frequent in Cheshire (Foster 1985).

***Dytiscus lapponicus* Gyllenhal, 1808**

**B**

An upland species that is rare throughout Ireland but recorded from a scattering of sites in most upland areas in the north and west (Foster and Lott 1989). In the south there are recent records from Mayo and Kerry. There are no early records from Northern Ireland. *D. lapponicus* has been recorded in small lakes and bog pools between 285 and 485m in two areas of FE and on the Garron plateau in AN. In Britain apart from isolated records in north Wales it is confined to northern and western Scotland (Foster 1985).

***Dytiscus marginalis* (Linnaeus, 1758)**

**D**

The commonest *Dytiscus* species present in lowland ponds, small lakes and occasionally running water throughout the province. This is a common and widespread species in the rest of Britain and Ireland.

***Dytiscus semisulcatus* Müller, 1776**

**C**

The vice-county distribution indicates that *D. semisulcatus* has as wide a range in Ireland as *D. marginalis*. The modern records show that this species is recorded from fewer sites and that it is more restricted in habitat choice. It is found most often in peaty pools in cutover bogs and fens. The distribution in N. Ireland is predominately eastern and it is frequent in the inter-drumlin fens of eastern AR and DO. There are only two records for AN and FE and a single site in LD. There appear to be no records from TY.

## **GYRINIDAE**

This family contains the familiar whirligigs that are superbly adapted to their surface-dwelling life. Adults frequently school on the water surface, but also dive when disturbed. Amongst the adaptations are completely separated compound eyes and the



production of phenol compounds that are used as tracks on water surface. All of the ten recorded Irish species have been collected in N. Ireland

***Gyrinus aeratus* Stephens, 1835**

**C**

Uncommon. This whirligig is found on unproductive lakes and acidic bog pools. The few records are well-scattered and mostly in the north and west in FE, TY, LD with a single site from an extensive fen in south DO.

***Gyrinus caspius* Ménériés, 1832**

**C**

This is a relatively common and widespread species of lakes and large pools on fens and cutover bogs. The map in Foster (1985) shows a striking, almost exclusively coastal, distribution in Britain for this species. The few Irish records available at that time suggested a similar pattern. However it is now known to occur widely inland in N. Ireland. *G. caspius* has been recorded from all counties but most of the records are from fen pools and lakes in central and eastern DO.

***Gyrinus distinctus* Aubé, 1838**

**C**

Prior to 1988 there were no records of this species in N. Ireland. Balfour-Browne (1951) lists Roscommon, North and South Kerry as the only vice-counties with records. Records from Co. Galway (Crisp and Heal 1958) and Co. Westmeath (Bilton 1988) appear to be the only recent published records. In N. Ireland *G. distinctus* is confined to FE, where it is locally common in open swamps and sheltered bays on mesotrophic lakes, especially around Upper Lough Erne. As *G. distinctus* has been rarely recorded elsewhere in Ireland or Britain (Foster 1985), the FE sites appear to constitute the main concentration of records of this rare species.

***Gyrinus marinus* Gyllenhal, 1808**

**D**

The second most common whirligig that is widely distributed in the south of N. Ireland and especially in eutrophic lakes in the Upper Lough Erne basin. There are no recent records from AN and only one in LD.

***Gyrinus minutus* Fabricius, 1798**

**D**

*G. minutus* is the smallest species of whirligig. It is found on acid pools on lowland raised bogs and to a lesser extent on small mesotrophic lakes. The altitudinal range of the sites shows this to be primarily a lowland species that is rare above 250m and apparently absent from natural pools complexes in blanket bogs. The highest record is from a small lake on the Garron plateau, AN at 340m. The distribution includes the eastern cutover bog complexes, and mesotrophic lakes in south TY and west FE.

***Gyrinus natator* (Linnaeus), 1758**

**C**

This has been shown to be a highly characteristic species of cutover bogs (Foster et al. 1992). It has been recorded on all the large eastern sites and on outlying sites in south AR and TY. It is also found in fen ponds in eastern DO and on the Crom estate in FE. *G. natator* is a rare species in most of western Europe and has been lost from its few British sites due to habitat succession. It is clearly one species for which the N. Irish sites are especially important. The habitat preferences shown by the recent records, coupled with its extinction from its few British localities (which were also cutover bogs) suggests a need for maintenance of the pool complexes on these bogs.

***Gyrinus paykulli* Ochs, 1927**

**C**

This has a similar habitat preference to *G. distinctus* and the two species were often found together. Prior to 1988 there were no records of this species in N. Ireland; Balfour-Browne (1951) lists South Kerry, Roscommon, Mid-Cork and Sligo as the only vice-counties with records. Since 1986 it has been recorded in three counties in the Republic (Bilton 1988; Foster and Lott 198) and from 13 sites in east DO, south AR and FE. The records are from mesotrophic lake margins or large fen pools.

***Gyrinus substriatus* Stephens, 1828**

**E**

Easily the commonest and most widespread whirligig, found on all types of water throughout the province from sea level to almost 500m.

***Gyrinus urinator* Illiger, 1807**

**X**

This is a riverine species typically found on quiet backwaters and margins of streams and small rivers. There are no recent records but Balfour-Browne (1951) reports its occurrence in AN.

***Orectochilus villosus* (Müller, 1776)**

**C**

This is a nocturnal species that rests by day under rocks at the edges of rivers and lakes. Most of the post-88 records are from Upper Lough Erne on open rocky shores, but there are also records from smaller, mesotrophic lakes and rivers in FE, TY and AN. Rivers are usually considered its normal habitat in much of its range and therefore the species may be more widespread than the present records indicate. Balfour-Brown lists DO and AR amongst the vice-counties with records.

## **HYDROPHILIDAE**

The nomenclature of this family has changed considerably since Balfour-Brown (1958) and old literature records can be impossible to reconcile with modern names. As defined in the Irish checklist this family consists of several distinct groups of beetles that are associated with wetland habitats and also decaying vegetation and dung. Some recent reviews have raised some of the subfamilies to family status. In general the aquatic species in this family are found at the edges of water bodies and many are associated with temporary wetlands. The genus *Cercyon*, and the three *Sphaeridium* species, includes many dung-feeding species that are not associated with water.

***Hydrochus brevis* (Herbst, 1793)**

**B**

Very rare with just one modern Irish record from Brackagh Bog NNR AR, in June 1989. This is a fenland species which in Britain has a very disjunct distribution from northern Scotland to East Anglia and which has suffered a severe decline (Foster 1987). The only Irish records are from DO and AN (Balfour-Browne 1951). These records in fact all refer to the Moira/Soldierstown area where the species has been taken "in the canal near Moira" by C.W. Buckle, "close to the road bridge near Soldierstown in Co. Antrim" by W.M. Crawford, and on the "Antrim side of Moira" by Prof. F. Balfour Browne (Crawford 1939). The Buckle record, which is the record published in Johnson and Halbert (1901), was ascribed by Balfour-Browne to DO (Crawford 1939), though the basis for this supposition is not known but which accounts for this vice-county record. Therefore the previous records of *H. brevis* whilst probably not from the exact same sites, are clearly all from a narrow circumscribed area along the now disused Lagan Canal.

***Hydrochus ignicollis* Motschulsky, 1860**

**B**

This species has previously been confused with *H. elongatus* (Schaller), which is not believed to occur in Ireland. Old records under this name probably refer to this species, but can only be accepted if vouchers exist. There are old records of *H. elongatus* sensu stricto from AR, DO and AN (Balfour-Browne 1958). *H. ignicollis* is very rare, and there are only two post-88 records, both from mossy calcareous fens beside marl lakes in south-east FE. Bilton (1989) recorded it from one site in Co. Westmeath that appears to be the only other recent Irish record. *H. ignicollis* is considered very rare in Britain where it is confined to ancient fens in south-eastern England with an outlying record in Anglesey. The true *H. elongatus* has a similar habitat preference and distribution to this species.

***Helophorus aequalis* Thomson, 1868**

**E**

Common and widespread found at grassy edges to pools and lakes throughout lowlands but also locally in the uplands up to 350m. It has been recorded in all counties.

***Helophorus alternans* Gén , 1836** **X**

In Britain this uncommon species is found in saltmarshes and occasionally inland in heathland pools. The sole basis for its inclusion on the Irish list rests on a single record by Buckle in 1900 from Culmore Moss, LD (but in vice county of East Donegal) (Balfour-Browne 1951). As this is a southern European species, which in Britain is established only in SE England, this record far to the north of its normal range, is likely to have been a migrant specimen. Its status in Scotland is also considered to be that of a very occasional migrant (Foster 1995).

***Helophorus arvernicus* Mulsant, 1846** **A**

There are pre-1950 records of *H. arvernicus* from vice-counties AN, DO and LD (Balfour-Browne 1951). The list in Balfour-Browne (1958) excludes DO from the list. These records are the only previous Irish ones. The only recent record is from the tidal stretch of the Bann Estuary, LD. This species is found on sandy or muddy edges of rivers, including tidal stretches, so is probably under-recorded. In Britain it is commonest in the north and west and particularly southern Scotland (Foster 1987).

***Helophorus brevialpis* Bedel, 1881** **F**

This is a widespread and abundant species found in many aquatic habitats, and one of the commonest beetles in Britain and Ireland.

***Helophorus flavipes* (Fabricius, 1792)** **E**

A very common and widespread species found throughout N. Ireland. In parts of its range it is considered a species of acid waters but it is much more general here occurring beside non-acid pools and streams.

***Helophorus fulgidicollis* Motschulsky, 1860** **A**

This is a strictly brackish species that formerly was considered a variety (*mulsanti*) of *H. flavipes* (Balfour-Browne 1951, 1958). In Ireland it is confined to suitable habitat on the east and south coast from Co. Kerry to DO. A recent record of this species, but requiring confirmation, is from the saltmarsh at Mill Bay, Carlingford Lough, DO.

***Helophorus grandis* Illiger, 1798** **D**

A common inhabitant of shallow waters by ponds and lakes. It is often associated with *H. aequalis* but *H. grandis* is much less common and less widespread.

***Helophorus granularis* (Linnaeus, 1761)** **X**

An inhabitant of shallow, grassy pools that is very locally distributed throughout its range. There are no recent records, but there are records from DO, AN and LD (Balfour-Browne 1951). The recorded Irish distribution suggests a coastal distribution that also appears to be the pattern in Britain.

***Helophorus minutus* Fabricius, 1775** **C**

In Britain this is a common species of shallow grassy pools. This habitat has not received much attention in N. Ireland, and there are few recent records from suitable pools and the edges of streams in coastal districts and at the margins of the large inland lakes.

***Helophorus obscurus* Mulsant, 1844** **C**

In N. Ireland this species that is very similar to *H. flavipes* is uncommon. The few well-scattered records are from the edges of coastal pools, streams and base-rich fens in DO, AR, FE and LD.

***Helophorus strigifrons* Thomson, 1868** **X**

Like many *Helophorus*, *H. strigifrons* is found in shallow temporary pools with sedges and rushes (Friday 1988). This habitat type has not received much attention and there are

no recent records of this species. According to Balfour-Browne (1958) it has been collected in four Irish vice-counties, including AN.

***Coelostoma orbiculare* (Fabricius, 1775) D**

This is a fen species that is frequent in the interdrumlin fens of DO and AR, but is not uncommon in the rest of the province in more acid bogs. There are records from all counties.

***Sphaeridium marginatum* Fabricius, 1793 X**

Recorded by Johnson and Halbert (1902) as a variety of *S. bipustulatum* Fab., but more recently elevated to species rank (Berge Henegouwen 1989). J & H give several localities in DO and AR but the species has not been seen in our area recently. A dung species.

***Sphaeridium lunatum* Fabricius, 1792 B**

Not mentioned as a separate species by Johnson and Halbert (1902) and first recorded as Irish by O'Mahony (1928). Common and widely distributed in cattle dung, but undoubtedly under-recorded.

***Sphaeridium scarabaeoides* (Linnaeus, 1758) B**

Common and widely distributed in cattle dung but under-recorded.

***Cercyon analis* (Paykull, 1798) C**

Frequent in driftline debris on the shores of lakes including Lough Neagh and in composted vegetation generally.

***Cercyon atricapillus* (Marsham, 1802) B**

Very local in sheep dung but insufficient data are available to comment on its habitat preferences. Recorded recently from hill pasture at Knockdhu/Scawt Hill north-west of Lame. Johnson and Halbert (1902) give a record for Belleisle, Fermanagh (Porter, 1898).

***Cercyon convexiusculus* Stephens, 1829 D**

This is a frequent species in the mossy fens of DO and AR and also a few sites in FE.

***Cercyon depressus* Stephens, 1829 B**

Very local and rare in coastal strandline debris and in jetsam on sandy shorelines on Lough Neagh (Anderson 1979).

***Cercyon haemorrhoidalis* (Fabricius, 1775) C**

Very common in herbivore dung.

***Cercyon impressus* Strum, 1807 C**

Very similar in habits and appearance to *C. Haemorrhoidalis* and often found with it in a variety of herbivore dung.

***Cercyon lateralis* (Marsham, 1802) C**

Another dung species with a wide distribution and catholic in its preferences.

***Cercyon littoralis* (Gyllenhal, 1808) C**

A coastal strandline species that is very widespread and generally common under drying seaweed on sand in sheltered bays and inlets.

***Cercyon lugubris* (Olivier, 1790) X**

Not seen recently in N. Ireland but recorded from Ballycastle and Armagh by Johnson and Halbert (1902). Not as stenoecious as some other dung species and recorded also from various types of rotting organic matter (Hansen 1987).

***Cercyon marinus* Thomson, 1853 C**

Regarded as a rare species by Johnson and Halbert (1902) but found in numbers on a Lough Neagh sandy beach at Rea's Wood NNR, at saltmarshes in the Harbour Estate,

Belfast, in the Quoile Pondage and inland fens in DO and FE recently. A species of decaying organic matter or moss in water margin habitats.

***Cercyon melanocephalus* (Linnaeus, 1758) C**

Probably the commonest *Cercyon* in N. Ireland and ubiquitous in herbivore dung.

***Cercyon pygmaeus* (Illiger, 1801) B**

A dung species and abundant where it occurs but somewhat localised. According to Hasen (1987) also in other kinds of decaying organic matter.

***Cercyon quisquilius* (Linnaeus, 1761) X**

Not recorded for N. Ireland recently but possibly overlooked. Johnson and Halbert (1902) give records for four counties and it appears to have been widespread in a variety of decaying organic matter including dung. A distinctive species and certainly not encountered in herbivore dung in recent years.

***Cercyon terminatus* (Marsham, 1802) X**

Johnson and Halbert (1902) recorded this species from Belfast and Armagh but it has not been seen recently. They describe it as "not common". Hansen (1987) describes it as euryoecious, in all kinds of decaying organic matter.

***Cercyon tristis* (Illiger, 1801) B**

Recorded in recent years from a variety of habitats including estuarine water meadows, riverine fen and a rubbish dump. Added to the Irish list by Halbert (1910) from Shane's Castle on Lough Neagh, and possibly more widespread currently than it was earlier in the century.

***Cercyon unipunctatus* (Linnaeus, 1758) X**

Johnson and Halbert (1902) describe this species as common but there are no recent records for our area. Hansen (1987) describes it as somewhat synanthropic in decaying organic matter, occurring mainly around farm buildings etc.

***Cercyon ustulatus* (Preyssler, 1790) B**

Found recently on the sandy shores of Lough Neagh at Rae's Wood NNR and in Shane's Castle Estate. It was found at these localities under dead wood on sandy or loam banks at the margins of freshwater. Hansen (1987) gives the habitat as "wet mud near the edge of water...under...pieces of wood" and the like.

***Megasternum obscurum* (Marsham, 1802) D**

Widespread and abundant in a variety of decaying organic matter including dung, leaf litter and driftline debris. Not usually found in peatlands.

***Cryptopleurum minutum* (Fabricius, 1775) C**

A dung species occurring in relatively small numbers in the dung of herbivores. Hansen (1987) also gives compost, rotting grass and carrion as habitats.

***Cryptopleurum subtile* Sharp, 1884 A**

Recorded new to Ireland from composted leaves and grass in a Parks Department midden in Barnett's Park, Belfast (Anderson 1992). Clearly a recent arrival in Ireland but likely to spread in compost in synanthropic situations.

***Paracymus scutellaris* (Rosenhauer, 1758) B**

A heathland species that is typically found in upland seepages and is highly characteristic 'Atlantic' species of the west of Britain and Ireland. Prior to 1988 there were no N. Ireland records. Since then it has been collected at several sites in the Mournes and on a lowland raised mire in FE. The lack of records from other areas could be due to the lack of sampling in its preferred habitat rather than a genuine absence. However, Balfour-Browne (1951) lists no records from northern counties.

***Hydrobius fuscipes* (Linnaeus, 1758) E**

Common and widespread in lowland pools and fens in all counties though scarce north of Lough Neagh.

***Anacaena globulus* (Paykull, 1798)**

**F**

This is one of the most commonly recorded of the aquatic Coleoptera. It is found in all counties and beside many still-water habitats, streams and rivers from sea-level to over

***Anacaena limbata* (Fabricius, 1792)**

**D**

This is found in productive fens, and is the least common of the three Irish *Anacaena* species. The majority of sites at which it has been recorded are fens by Upper Lough Erne and Lough Neagh. There are no records from AN and LD away from Lough Neagh.

***Anacaena lutescens* (Stephens, 1829)**

**E**

This considered an acid water species. It is however very frequent in the south-eastern fens and was often with *A. globulus*. The distribution is a southern one with only a few records in north AN and LD.

***Laccobius atratus* (Rottenberg, 1874)**

**B**

Like *Paracymus scutellaris* this is a characteristic species of Atlantic peat mosses, but it is found further east in Britain and has only once been recorded in Scotland. There are records from the west coast from Kerry to Mayo (Friday 1989) and also now in the Mournes, DO, where it has been found commonly in extensive areas of flushed heath.

***Laccobius atrocephalus* Reitter, 1872**

**B**

A riverine species found in the muddy and silty edges of rivers and streams. There are a few widely scattered recent records in FE, DO and AN. Like all species which predominately inhabit river margins, its true distribution is still unclear due to a lack of sampling in its main habitat. The few old records from just three vice-counties, do however suggest it is one of the rarer Irish *Laccobius*. Foster (1995) however considered it to be the commonest species in Kerry.

***Laccobius biguttatus* Gerhardt, 1877**

**C**

There are records from fens and the margins of base-rich ponds in the Erne valley, the SW shore of Lough Neagh and the SW corner of Strangford Lough.

***Laccobius bipunctatus* (Fabricius, 1775)**

**C**

This is the most commonly recorded species of *Laccobius* with many records from fens in the south and east. The species is largely absent from the north and west.

***Laccobius minutus* (Linnaeus, 1758)**

**C**

The recent records show this is a relatively common species in FE, but much scarcer in all other counties and not recorded from TY. The majority of the records are from grassy edges of lakes that is its typical habitat in Britain.

***Laccobius sinuatus* Motschulsky, 1849**

**X**

This uncommon species is listed as being found in DO by Balfour-Browne (1951) and five other Irish vice-counties. It is found on the bare edges of streams and flushes (Hansen 1987). There are no recent records from anywhere in Ireland.

***Laccobius striatulus* (Fabricius, 1801)**

**C**

Stony edges to lakes and rivers are the major habitat of this species. AN, DO and FE are the only counties with recent records. Most of the records are from the margins of Upper and Lower Lough Erne and satellite loughs. There have also been records from a stream in AN and two sandpits in DO

***Enochrus affinis* (Thunberg, 1794)**

**D**

Typically a bog land species this shows a noticeably northern and western distribution within N. Ireland from western FE, through the uplands in TY and LD to north AN. It has been collected in sites with relict habitat in DO.

***Enochrus bicolor* (Fabricius)**

**B**

This is a brackish pool species that has been recorded in both AN and DO in the past (Balfour-Browne 1951). There have been two recent records, both from brackish pools at the edge of Strangford Lough.

***Enochrus coarctatus* (Gredler, 1863)**

**D**

This is the most commonly recorded *Enochrus* in N. Ireland. It is a species of productive fens so has a south-eastern distribution typical of such species. There have been no records from TY. It is widespread throughout Ireland.

***Enochrus fuscipennis* (Thomson, 1884)**

**C**

This is a frequent species of flushed heaths and bogs. The majority of recent records are from the north and west in north AN, the Sperrins of LD and TY and west FE. The species also occurs in flushed heaths in the Mourne. AR is the only county without a recent record.

***Enochrus ochropterus* (Marsham, 1802)**

**C**

*E. ochropterus* appears to be the lowland and fenland counterpart of *E. fuscipennis*. Most of the recent records are from DO and AR with no more than two records from each of the other four counties.

***Enochrus testaceus* (Fabricius, 1801)**

**D**

This is a locally common fen species that is frequent in the DO fens but much scarcer in other counties and not apparently recorded in TY.

***Cymbiodyta marginella* (Fabricius, 1792)**

**B**

Apart from one record from a lake-side fen in FE, this uncommon fenland species is confined to a few sites in eastern DO. These include shallow pools in reclaimed estuarine ground in inner Belfast and a few natural fens around the eastern shore of Strangford Lough. These are the first records from N. Ireland since 1900. The only previous record was from a pool on Binevenagh in northern LD (Crawford 1936).

***Chaetarthia seminulum* (Herbst, 1797)**

**C**

This is one of the smallest aquatic Coleoptera. It has just been recognised that there is a second species of *Chaetarthia*, *C. similis* Wollaston in western Europe, including Britain, which is found beside running water. *C. seminulum* sensu stricto is found in wet mud by pools and seepages and it is more often taken in pitfalls than by conventional netting. All Irish material that has been checked has proved to be this species (G. Foster pers comm.). Old records are unreliable unless vouchers exist. Most of the few N. Irish records of this undoubtedly under-recorded beetle have been collected in the DO fens.

**HYDRAENIDAE**

A family of small rather elongate beetles in three genera. Most of the species are found in running water or saltmarshes. Many are considered rare though this may be biased by difficulty in sampling their often specialised habitat. Of the 23 species recorded in Ireland, there have been records of 17 in N. Ireland.

***Ochthebius auriculatus* Rey, 1885**

**A**

There is a single recent records of this saltmarsh species from the east shore of Strangford Lough, DO. There have been no previous N. Irish records. The Irish distribution is limited to the east coast counties of Wicklow, Dublin and Meath (Balfour-Browne 1951).

***Ochthebius bicolor* Germar, 1824**

**B**

A riverine *Ochthebius*, recorded from two localities in north AN, and one in LD. These are the only modern Irish records. Old records are few and unacceptable without

vouchers, as in the past this species was confused with *O. dilatatus*. Lack of appropriate recording in its bankside habitat may mean the species has been under-recorded.

***Ochthebius dilatatus* Stephens, 1829** **C**

*O. dilatatus* is found beside still water both brackish and fresh. There is a strong coastal bias to the recent records that cover the east and north coast from Dundrum Bay, DO to Lough Foyle, LD. The only inland record is from a turlough in FE.

***Ochthebius exsculptus* Germar, 1824** **X**

This is a riverine species found beside fast-flowing, usually base-rich rivers. Like all bank-dwelling species it requires specific searching and is unlikely to be taken by kick-sampling. In Balfour-Browne (1951) records are listed from six Irish vice-counties including DO and LD. However Balfour-Browne (1958) refers to it being present in only 5 vice-counties, and the maps indicates it to be present in AN. This map is repeated in Foster (1990). There appear to be no recent records.

***Ochthebius lejolisi* Mulsant and Rey, 1861** **C**

The habitat of this species is very distinctive and it is usually the only beetle species found in it. It occurs in rock pools, often with fringing areas of *Enteromorpha*, within the splash zone. On individual stretches of suitable habitat however, it is often very localised and missing from many apparently suitable pools (Foster 1990). The broad Irish distribution of *O. lejolisi* has been well-recorded (Balfour-Browne 1951) and the recent records only fill in a few of the gaps on the east coast between Newcastle and Cushendun.

***Ochthebius marinus* (Paykull, 1798)** **B**

A saltmarsh species found along the east and south coast of Ireland including DO and AN (Foster 1990). The few post-1988 records have been from three sites around Strangford Lough and at Strand Lough, Killough, all in DO.

***Ochthebius minimus* (Fabricius, 1792)** **A**

This is the most widespread member of the genus found in many types of water. Old records indicate it has a widespread distribution in Ireland including AR, AN, DO and LD. The only recent record from N. Ireland however has been from a eutrophic drain in FE, but it has been taken in a number of sites in central Ireland (Bilton 1988; Bilton and Lott 1991).

***Ochthebius punctatus* Stephens, 1829** **C**

Confined to brackish water this can be a common species in the right habitat. Old records suggest this is the commonest species of brackish-water *Ochthebius* in Ireland. It has been recorded in suitable habitat around most of the Irish coast (Balfour-Browne 1958). Since 1988 it has been collected in saltmarsh pools and brackish ditches in Lame Lough, AN and Belfast, Strangford and Carlingford Loughs, DO.

***Ochthebius viridis* Peyron, 1858** **A**

A saltmarsh beetle with only one previous N. Irish record from AR (Balfour-Browne (1951 and 1958). This must mean it was recorded along the tidal shore below Newry, the only area of coastline in this county. There is one recent record from the saltmarsh at Horse Island on the east shore of Strangford Lough, DO. In the rest of Ireland it has been recorded round much of the coast except the north.

***Hydraena britteni* Joy, 1907** **C**

A characteristic but locally distributed fen species that is found also in cutover raised bogs and recorded from suitable habitat in all counties. This is the most frequently recorded *Hydraena* since 1988. This is probably due to its habitat preferences rather than a true reflection of the situation as most other *Hydraena* species are found beside running water.



***Hydraena gracilis* Germar, 1824**

**B**

A common and widespread species in the north and west Britain where its habitat of mossy rocks along fast-flowing streams and rivers is most common. Irish records are relatively fewer and confined to upland areas (Balfour-Browne 1958) including AR, LD, DO, and AN. The only recent records are from typical habitat in FE and AN. Further surveys of rivers are needed to ascertain its true status.

***Hydraena minutissima* Stephens, 1829**

**X**

A riverine species typically found in rapidly-flowing streams. There are records from LD, West Cork, North Kerry and Wicklow (Balfour-Browne 1951). A record from AR is shown on the map in Balfour-Browne (1958). There are no recent records from anywhere in Ireland.

***Hydraena nigrita* Germar, 1824**

**A**

*H. nigrita* occurs, like most *Hydraena*, in running unpolluted water including woodland streams (Hansen 1987) and extremely shallow running water (Foster 1994). In Britain it is the third-commonest of the running-water species (Foster 1990). However there are few claimed Irish records and Balfour-Browne (1958), because of confusion in identification of many records, was confident in only his single Irish record from AN. It has subsequently only been found twice in Ireland, in a stream on the Stormont Estate, DO and in Co. Clare (Bilton 1988).

***Hydraena pulchella* Germar, 1824**

**X**

There are no recent records from anywhere in Ireland. It has previously been recorded from AR, DO, AN and LD. (Balfour-Browne 1951). Like most *Hydraena* species it is found beside running water especially where the edge is silty (Foster 1990) or grassy (Balfour-Browne 1958). The records show it has a very scattered distribution in Britain north to southern Scotland (Foster 1990), but there are relatively few recent records (Foster 1994). It can be common at individual sites (Hansen 1987) and Balfour-Browne (1958) describes finding it in numbers beside a stream at the edge of Killough Harbour, DO.

***Hydraena riparia* Kugelann, 1794**

**C**

One of the commonest and most widespread *Hydraena* species in Britain found at the edges of ponds and streams. It has been recorded widely in Ireland including all counties of N. Ireland except TY (Balfour-Browne 1951). Since 1988 there have been scattered recent records in AR, DO, FE and TY in typical habitat.

***Hydraena rufipes* Curtis, 1830**

**X**

A riverine species for which there are no recent N. Irish records. Balfour-Browne (1951) lists AR as one of the seven vice-counties in which it has been collected, but in his later publication (1958) he mentions that there are only three Irish records from counties Carlow, Kerry and Meath. The status of *H. rufipes* in N. Ireland must therefore be unconfirmed. *H. rufipes* is usually found beside rivers amongst moss and fine shingle but also in exposed quarry ponds (Foster 1990).

***Limnebius truncatellus* (Thunberg, 1794)**

**D**

A common species found beside a wide variety of lowland pools and stream. Recorded from all counties.

***Limnebius nitidus* (Marsham)**

**X**

This is one of the smallest water beetles and is found in wet mud and amongst mosses at the edge of pools and streams. There are no recent records, but records from all five counties except TY are listed in Balfour-Browne (1951).

**ELMIDAE**

These are commonly called riffle beetles because they inhabit the fast-flowing sections of rivers and streams. They are considered to be sensitive to pollution as they are

plastron-breathers, relying on oxygen diffusion from the water. All four species that are known to be present in Ireland have been collected in N. Ireland.

***Elmis aenea* (Müller)**

**E**

Occurs in moss-covered rocks in swift rivers and streams. The data in Roberts and Mackie (1993) shows it to be a very common species in the Foyle system and present in all the other rivers covered in this survey. Further work will probably show it occurs in suitable riverine habitat throughout N. Ireland.

***Limnius volckmari* (Panzer)**

**E**

This riverine species is found amongst fine gravel in clean fast rivers and is easily detected by kick-samples. It is very common in the Foyle system (Roberts and Mackie 1993) and present in many other rivers throughout all counties where suitable habitat is found.

***Esolus parallelepipedus* (Müller)**

**B**

There are three recent records of this species, two from FE and one from AN. As this is a bank-dwelling species, found beside streams and rivers, it is likely to be under-recorded.

***Oulimnius tuberculatus* (Müller)**

**D**

Common and widespread, found amongst gravel in rivers and also exposed shores of clean lakes. It has been found in all counties in N. Ireland with most of the records from rivers.

## **ACKNOWLEDGEMENTS**

I am very grateful to Dr Garth Foster, Richard Weyl and Dr Roy Anderson for the information provided to compile this and also for commenting on the text.

## REFERENCES

- Balfour-Browne, F.** 1940 *British Water Beetles* Volume 1. Ray Society, London.
- Balfour-Browne, F.** 1950 *British Water Beetles* Volume 2. Ray Society, London.
- Balfour-Browne, F.** 1951 The Aquatic Coleoptera of Ireland. *Ent. Gaz.* **2**: 1-52
- Balfour-Browne, F.** 1958 *British Water Beetles* Volume 3. Ray Society, London.
- Bilton, D.T.** 1988 A survey of the Aquatic Coleoptera in central Ireland and the Burren. *Bull. Ir. biogeog. Soc.* **11**:77-94
- Bilton, D.T. and D.A. Lott.** 1991 Further records of aquatic Coleoptera from Ireland *Ir. Nat. J.* **23**: 389-397
- Crawford, W.M.** 1934. Irish Coleoptera records *Ir. Nat. J.* **5**: 121
- Crawford, W.M.** 1936. Irish Coleoptera records *Ir. Nat. J.* **6**: 148
- Crawford, W.M.** 1937. New Irish water beetle-*Rantus pulverosus* Stephens. *Ir. Nat. J.* **6**:169
- Crawford, W.M.** 1939. *Hydroporus dorsalis* F. and *Hydrochus brevis* Herbst. in Co. Antrim. *Ir. Nat. J.* **7**: 145
- Crisp, D.T. and O.W. Heal.** 1958 The Corixidae (O. Hemiptera), Gyrinidae (O. Coleoptera) and Cladocera (Subphylum Crustacea) of a bog in western Ireland. *Ir. Nat. J.* **12**: 297-304
- Foster, G.N.** 1981 Atlas of British Water Beetles Preliminary Edition Part 1. *Balfour-Browne Club Newsletter* **22**
- Foster, G.N.** 1983 Atlas of British Water Beetles Preliminary Edition Part 2. *Balfour-Browne Club Newsletter* **27**
- Foster, G.N.** 1984 Atlas of British Water Beetles Preliminary Edition Part 3. *Balfour-Browne Club Newsletter* **31**
- Foster, G.N.** 1985 Atlas of British Water Beetles Preliminary Edition Part 4. *Balfour-Browne Club Newsletter* **35**
- Foster, G.N.** 1987 Atlas of British Water Beetles Preliminary Edition Part 5. *Balfour-Browne Club Newsletter* **40**
- Foster, G.N.** 1990 Atlas of British Water Beetles Preliminary Edition Part 6. *Balfour-Browne Club Newsletter* **48**: 1-18
- Foster, G.N.** 1994. Biodiversity Inventory for Scotland: Aquatic Coleoptera. *Scottish Natural Heritage Review* No. 26
- Foster, G.N.** 1994. *Chaetarthia similis* Wollaston in Britain *Latissimus* **4**: 2
- Foster, G.N. and D.A. Lott** 1988 Beyond the pale. *Balfour-Browne Club Newsletter* **42**: 7-8
- Foster, G.N. and D.A. Lott** 1989 Modern records of upland Aquatic Coleoptera (Dytiscidae) in Ireland. *Ir. Nat. J.* **23**: 72-73
- Foster, G.N, B.H. Nelson, D.B. Bilton, D.A. Lott, R. Merritt, R.S. Weyl and M.D. Eyre.** 1992 A classification and evaluation of Irish water beetle assemblages. *Aquatic Conservation: Marine and Freshwater Ecosystems.* **2**: 185-208
- Friday, L.E.** 1987 New records of the aquatic Coleoptera from Cos. Cork and Kerry. *Ir. Nat. J.* **22**: 343-345

- Friday, L.E.** 1988 *A key to British water beetles*. Field Studies Council Publication **189**, Taunton
- Hansen, M.** 1987 The Hydrophiloidea (Coleoptera) of Fennoscandia and Denmark. *Fauna Entomologica Scandinavica* **18**. E.J.Brill/Scandinavian Science Press Ltd. Leiden and Copenhagen
- Holmen, M.** 1987 The aquatic Adephaga (Coleoptera) of Fennoscandia and Denmark. 1. Gyrinidae, Haliplidae, Hygrobiidae and Noteridae. *Fauna Entomologica Scandinavica* **20**. E.J.Brill/Scandinavian Science Press Ltd. Leiden and Copenhagen
- Hyman, P. S.** 1992 *A review of the scarce and threatened Coleoptera of Great Britain Part 1*. U.K. Nature Conservation **3**. JNCC, Peterborough
- Johnson, W.F. and J.N. Halbert.** 1902. A list of the Beetles of Ireland. *Proc. R. Ir. Acad.* **4B**: 535-827.
- Lansbury, I.** 1965 Notes on the Hemiptera, Coleoptera, Diptera and other invertebrates of the Burren, Co. Clare and Inishmore, Aran Islands. *Proc R. Ir. Acad.* **64B**: 89-115
- Roberts, D. and T.G. Mackie.** 1993. *Survey of the Freshwater Pearl Mussel populations of Northern Ireland*. Unpublished report (DOE CP1432/1) to the Environment Service, Department of Environment for Northern Ireland.

**APPENDIX 1:** Checklist of Irish aquatic Coleoptera. A + denotes the species has been recorded in N. Ireland.

**HALIPLIDAE**

BRYCHIUS	<i>elevatus</i> (Panzer)	+
HALIPLUS	<i>apicalis</i> Thomson	+
	<i>confinis</i> Stephens	+
	<i>flavicollis</i> Sturm	+
	<i>fluviatilis</i> Aubé	+
	<i>fulvus</i> (Fabricius)	+
	<i>immaculatus</i> Gerhardt	+
	<i>lineolatus</i> Mannerheim	+
	<i>lineatocollis</i> (Marsham)	+
	<i>obliquus</i> (Fabricius)	+
	<i>ruficollis</i> (DeGeer)	+
	<i>variegatus</i> Sturm	+
	<i>wehnckeii</i> Gerhardt	+

**NOTERIDAE**

NOTERUS	<i>clavicornis</i> (DeGeer)	+
	<i>crassicornis</i> (Müller)	+

**HYGROBIIDAE**

HYGROBIA	<i>hermanni</i> (Fabricius)	
----------	-----------------------------	--

**DYTISCIDAE**

LACCOPHILUS	<i>hyalinus</i> DeGeer	+
	<i>minutus</i> (Linnaeus)	+
HYPHYDRUS	<i>ovatus</i> (Linnaeus)	+
BIDESSUS	<i>minutissimus</i> (Germar)	
HYGROTUS	<i>inaequalis</i> (Fabricius)	+
	<i>versicolor</i> (Schaller)	
	<i>quinqulineatus</i> (Zetterstedt)	+
COELAMBUS	<i>confluens</i> (Fabricius)	+
	<i>impresopunctatus</i> (Schaller)	+
	<i>novemlineatus</i> (Stephens)	+
HYDROPORUS	<i>angustatus</i> Sturm	+
	<i>discretus</i> Fairmaire	+
	<i>erythrocephalus</i> (Linnaeus)	+
	<i>glabriusculus</i> Aubé	
	<i>gyllenhali</i> (Schiödt)	+
	<i>incognitus</i> Sharp	+
	<i>longicornis</i> Sharp	
	<i>longulus</i> Mulsant	+
	<i>melanarius</i> Sturm	+
	<i>memmonius</i> Nicolai	+
	<i>morio</i> Aubé	+
	<i>nigrita</i> (Fabricius)	+
	<i>obscurus</i> Sturm	+
	<i>obsoletus</i> Aubé	+
	<i>palustris</i> (Linnaeus)	+
	<i>planus</i> (Fabricius)	+
	<i>pubescens</i> (Gyllenhal)	+
	<i>scalesianus</i> (Stephens)	+
	<i>striola</i> (Gyllenhal)	+
	<i>tesselatus</i> Drapiez	+
	<i>tristis</i> (Paykull)	+

	<i>umbrosus</i> (Gyllenhal)	+	
SUPHRODYTES	<i>dorsalis</i> (Fabricius)	+	
STICTONECTES	<i>lepidus</i> (Olivier)	+	
GRAPTODYTES	<i>bilineatus</i> (Sturm)		
	<i>granularis</i> (Linnaeus)	+	
	<i>pictus</i> (Fabricius)	+	
PORHYDRUS	<i>lineatus</i> (Fabricius)	+	
POTAMONECTES	<i>assimilis</i> (Paykull)	+	
	<i>depressus</i> (Fabricius)	+	
	<i>griseostriatus</i> (DeGeer)	+	
STICTOTARSUS	<i>duodecimpustulatus</i> (Fabricius)	+	
OREODYTES	<i>davisi</i> (Curtis)	+	
	<i>sanmarki</i> (Sahlberg)	+	
	<i>septentrionalis</i> (Sahlberg)	+	
LACCORNIS	<i>oblongus</i> (Stephens)	+	
COPELATUS	<i>haemorrhoidalis</i> (Fabricius)		
AGABUS	<i>affinis</i> (Paykull)	+	
	<i>arcticus</i> (Paykull)	+	
	<i>biguttatus</i> (Olivier)	+	
	<i>bipustulatus</i> (Linnaeus)	+	
	<i>chalconatus</i> (Panzer)	+	
	<i>congener</i> (Thunberg)	+	
	<i>conspersus</i> (Marsham)	+	
	<i>guttatus</i> (Paykull)	+	
	<i>labiatus</i> (Brahm)		
	<i>melanocomis</i> Zimmermann	+	
	<i>nebulosus</i> (Forster)	+	
	<i>paludosus</i> (Fabricius)	+	
	<i>stumii</i> (Gyllenhal)	+	
	<i>unguicularis</i> Thomson	+	
ILYBIUS	<i>aenescens</i> Thomson	+	
	<i>ater</i> (DeGeer)	+	
	<i>fuliginosus</i> (Fabricius)	+	
	<i>guttiger</i> (Gyllenhal)	+	
	<i>quadriguttatus</i> (Lacordaire and Boisduval)	+	+
	<i>subaeneus</i> Erichson	+	
RHANTUS	<i>exsoletus</i> (Forster)	+	
	<i>frontalis</i> (Marsham)	+	
	<i>grapii</i> (Gyllenhal)	+	
	<i>suturalis</i> (Macleay)	+	
	<i>suturellus</i> (Harris)	+	
COLYMBETES	<i>fuscus</i> (Linnaeus)	+	
HYDATICUS	<i>seminiger</i> (DeGeer)	+	
ACILIUS	<i>canaliculatus</i> (Nicolai)	+	
	<i>sulcatus</i> (Linnaeus)	+	
DYTISCUS	<i>circumcinctus</i> Ahrens	+	
	<i>circumflexus</i> Fabricius		
	<i>lapponicus</i> Gyllenhal	+	
	<i>marginalis</i> Linnaeus	+	
	<i>semisulcatus</i> Müller	+	
<b>GYRINIDAE</b>			
GYRINUS	<i>aeratus</i> Stephens	+	
	<i>caspius</i> Ménétriés	+	

	<i>distinctus</i> Aubé	+
	<i>marinus</i> Gyllenhal	+
	<i>minutus</i> (Fabricius)	+
	<i>nataator</i> (Linnaeus)	+
	<i>paykulli</i> Ochs	+
	<i>substriatus</i> Stephens	+
	<i>urinator</i> Illiger	+
ORECTOCHILUS	<i>villosus</i> (Müller)	+
<b>ADEPHAGA</b>		
<b>GEORISSIDAE</b>		
GEORISSUS	<i>crenulatus</i> (Rossi)	
<b>HYDROCHIDAE</b>		
HYDROCHUS	<i>angustatus</i> Gemar	
	<i>brevis</i> (Herbst)	+
	<i>ignicollis</i> Motschulsky	+
<b>HELOPHORIDAE</b>		
HELOPHORUS	<i>aequalis</i> Thomson	+
	<i>altmans</i> Géné	+
	<i>arvemicus</i> Mulsant	+
	<i>brevipalpis</i> Bedel	+
	<i>flavipes</i> (Fabricius)	+
	<i>fulgidicollis</i> Motschulsky	+
	<i>grandis</i> Illiger	+
	<i>granularis</i> (Linnaeus)	+
	<i>griseus</i> Herbst	
	<i>minutus</i> Fabricius	+
	<i>nanus</i> Sturm	
	<i>obscurus</i> Mulsant	+
	<i>strigifrons</i> Thomson	+
<b>HYDROPHILIDAE</b>		
COELOSTOMA	<i>orbiculare</i> (Fabricius)	+
PARACYMUS	<i>scutellaris</i> (Rosenhauer)	+
HYDROBIUS	<i>fuscipes</i> (Linnaeus)	+
ANACAENA	<i>globulus</i> (Paykull)	+
	<i>limbata</i> (Fabricius)	+
	<i>lutescens</i> (Stephens)	+
LACCOBIUS	<i>atratus</i> (Rottenburg)	+
	<i>atrocephalus</i> Reitter	+
	<i>biguttatus</i> Gerhardt	+
	<i>bipunctatus</i> (Fabricius)	+
	<i>minutus</i> (Linnaeus)	+
	<i>sinuatus</i> Motschulsky	+
	<i>striatulus</i> (Fabricius)	+
HELOCHARES	<i>punctatus</i> Sharp	
ENOCHRUS	<i>affinis</i> (Thunberg)	+
	<i>bicolor</i> (Fabricius)	+
	<i>coarctatus</i> (Gredler)	+
	<i>fuscipennis</i> (Thomson)	+
	<i>halophilus</i> (Bedel)	
	<i>melanocephalus</i> (Olivier)	
	<i>ochropterus</i> (Marsham)	+
	<i>testaceus</i> (Fabricius)	+
CYMBIODYTA	<i>marginella</i> (Fabricius)	+



CHAETARTHRIA	<i>seminulum</i> (Herbst)	+
BEROSUS	<i>luridus</i> (Linnaeus)	
	<i>signaticollis</i> (Charpentier)	
<b>HYDRAENIDAE</b>		
OCHTHEBIUS	<i>auriculatus</i> Rey	+
	<i>bicolor</i> Germar	+
	<i>dilatatus</i> Stephens	+
	<i>exsculptus</i> Germar	+
	<i>lejolisi</i> Mulsant and Rey	+
	<i>marinus</i> (Paykull)	+
	<i>minimus</i> (Fabricius)	+
	<i>nanus</i> Stephens	
	<i>poweri</i> Rye	
	<i>punctatus</i> Stephens	+
	<i>viridis</i> Peyron	+
HYDRAENA	<i>britteni</i> Joy	+
	<i>gracilis</i> Germar	+
	<i>minutissima</i> Stephens	+
	<i>nigrita</i> Germar	+
	<i>pulchella</i> Germar	+
	<i>pygmaea</i> Waterhouse	
	<i>riparia</i> Kugelann	+
	<i>rufipes</i> Curtis	+
	<i>testacea</i> Curtis	
LIMNEBIUS	<i>aluta</i> (Bedel)	
	<i>nitidus</i> (Marsham)	+
	<i>truncatellus</i> (Thunberg)	+
<b>ELMIDAE</b>		
ELMIS	<i>aenea</i> (Müller)	+
ESOLUS	<i>parallelepipedus</i> (Müller)	+
LIMNIUS	<i>volckmari</i> (Panzer)	+
OULIMNIUS	<i>tuberculatus</i> (Müller)	+

APPENDIX 3

Species recorded from N. Ireland listed in abundance categories. British RDB status are given for comparison.

<b>A 1 post 1988 sites [10 species]</b>	<b>RDB Status in Gt. Britain</b>			
<i>Coelambus novemlineatus</i>	Nb	ASSI		
<i>Halipus variegatus</i>	RDB3		NNR	
<i>Helophorus arvernicus</i>	Nb			
<i>Helophorus fulgidicollis</i>	Nb	ASSI		
<i>Hydraena nigrita</i>	Nb			
<i>Hydrochus brevis</i>	RDB3		NNR	
<i>Ilybius subaeneus</i>	Nb			LNR
<i>Ochthebius auriculatus</i>	Nb	ASSI		LNR
<i>Ochthebius minimus</i>		ASSI		
<i>Ochthebius viridis</i>	Nb	ASSI		LNR
<b>B 2-5 post 1988 sites [22 species]</b>				
<i>Agabus biguttatus</i>	Nb			
<i>Agabus chalconatus</i>	Nb	ASSI	NNR	LNR
<i>Coelambus confluens</i>				
<i>Cymbiodyta marginella</i>		ASSI		
<i>Dytiscus circumcinctus</i>	Na	ASSI		LNR
<i>Dytiscus lapponicus</i>	Nb	ASSI		
<i>Enochrus bicolor</i>	Nb	ASSI		LNR
<i>Esolus parallelepipedus</i>			NNR	
<i>Halipus apicalis</i>	Nb			
<i>Halipus fluviatilis</i>		ASSI		LNR
<i>Hydraena gracilis</i>			NNR	
<i>Hydrochus ignicollis</i>	RDB3	ASSI		
<i>Hydroporus discretus</i>				
<i>Hydroporus longulus</i>	Nb	ASSI		
<i>Hydroporus morio</i>		ASSI		
<i>Hydroporus obsoletus</i>	Nb	ASSI		LNR
<i>Laccobius atratus</i>	Nb	ASSI		
<i>Laccobius atrocephalus</i>	Nb	ASSI	NNR	LNR
<i>Ochthebius bicolor</i>	Nb			
<i>Ochthebius marinus</i>	Nb	ASSI	NNR	LNR
<i>Oreodytes davisii</i>	Nb	ASSI	NNR	
<i>Paracymus scutellaris</i>	Nb	ASSI		LNR
<b>C 6-20 post 1950 sites [54 species]</b>				
<i>Acilius canaliculatus</i>	RDB3	ASSI	NNR	LNR
<i>Acilius sulcatus</i>		ASSI		LNR
<i>Agabus arcticus</i>		ASSI		
<i>Agabus congener</i>				
<i>Agabus guttatus</i>		ASSI		LNR
<i>Agabus melanocomis</i>		ASSI		LNR
<i>Agabus nebulosus</i>		ASSI		LNR
<i>Agabus paludosus</i>		ASSI		LNR
<i>Brychius elevatus</i>				LNR
<i>Chaetarthria seminulum</i>	Nb	ASSI		
<i>Coelambus impressopunctatus</i>		ASSI	NNR	
<i>Dytiscus semisulcatus</i>		ASSI	NNR	LNR
<i>Enochrus fuscipennis</i>		ASSI	NNR	LNR

<i>Enochrus ochropterus</i>	Nb	ASSI	NNR	
<i>Graptodytes granularis</i>	Nb	ASSI		
<i>Graptodytes pictus</i>		ASSI		LNR
<i>Gyrinus aeratus</i>	Nb	ASSI		
<i>Gyrinus caspius</i>		ASSI	NNR	
<i>Gyrinus distinctus</i>	RDB3	ASSI		LNR
<i>Gyrinus natator</i>	RDB1	ASSI	NNR	LNR
<i>Gyrinus paykulli</i>	Na	ASSI		LNR
<i>Haliplus confinis</i>		ASSI		LNR
<i>Haliplus flavicollis</i>		ASSI		
<i>Haliplus fulvus</i>		ASSI		
<i>Haliplus immaculatus</i>		ASSI	NNR	
<i>Haliplus lineolatus</i>		ASSI		LNR
<i>Haliplus obliquus</i>				LNR
<i>Helophorus minutus</i>		ASSI		LNR
<i>Helophorus obscurus</i>		ASSI		LNR
<i>Hydaticus seminiger</i>	Nb	ASSI	NNR	
<i>Hydraena britteni</i>		ASSI	NNR	
<i>Hydraena riparia</i>		ASSI	NNR	
<i>Hydroporus incognitus</i>		ASSI		LNR
<i>Hydroporus melanarius</i>		ASSI	NNR	
<i>Hydroporus scalesianus</i>	RDB2	ASSI	NNR	
<i>Laccobius biguttatus</i>		ASSI	NNR	LNR
<i>Laccobius bipunctatus</i>		ASSI		LNR
<i>Laccobius minutus</i>		ASSI	NNR	
<i>Laccobius striatulus</i>		ASSI		
<i>Laccornis oblongus</i>	RDB3	ASSI		
<i>Ochthebius dilatatus</i>		ASSI		LNR
<i>Ochthebius lejolisi</i>	Nb	ASSI	NNR	LNR
<i>Ochthebius punctatus</i>	Nb	ASSI	NNR	LNR
<i>Orectochilus villosus</i>		ASSI		
<i>Oreodytes septentrionalis</i>		ASSI		
<i>Porhydrus lineatus</i>		ASSI		
<i>Potamonectes assimilis</i>		ASSI		
<i>Potamonectes griseostriatus</i>	Nb	ASSI		
<i>Rhantus frontalis</i>	Nb	ASSI		LNR
<i>Rhantus grapii</i>	Nb	ASSI	NNR	
<i>Rhantus suturellus</i>		ASSI		
<i>Stictonectes lepidus</i>	Nb	ASSI		
<i>Suphrodytes dorsalis</i>		ASSI	NNR	
<i>Stictotarsus duodecimpustulatus</i>		ASSI		
<b>D 21-50 post 1950 sites [33 species]</b>				
<i>Agabus affinis</i>		ASSI	NNR	LNR
<i>Agabus unguicularis</i>	Nb	ASSI	NNR	
<i>Anacaena limbata</i>		ASSI	NNR	LNR
<i>Coelostoma orbiculare</i>		ASSI	NNR	LNR
<i>Colymbetes fuscus</i>		ASSI	NNR	LNR
<i>Dytiscus marginalis</i>		ASSI		LNR
<i>Enochrus affinis</i>	Nb	ASSI	NNR	
<i>Enochrus coarctatus</i>		ASSI	NNR	LNR
<i>Enochrus testaceus</i>		ASSI	NNR	
<i>Gyrinus marinus</i>		ASSI	NNR	LNR

<i>Gyrinus minutus</i>	Nb	ASSI	NNR	LNR
<i>Haliphus lineatocollis</i>		ASSI	NNR	LNR
<i>Haliphus wehnckeii</i>		ASSI	NNR	LNR
<i>Helophorus grandis</i>		ASSI	NNR	LNR
<i>Hydroporus angustatus</i>		ASSI	NNR	
<i>Hydroporus memnonius</i>		ASSI	NNR	LNR
<i>Hydroporus nigrita</i>		ASSI	NNR	LNR
<i>Hydroporus planus</i>		ASSI	NNR	LNR
<i>Hydroporus striola</i>		ASSI	NNR	LNR
<i>Hydroporus tessellatus</i>		ASSI	NNR	LNR
<i>Hydroporus tristis</i>		ASSI	NNR	LNR
<i>Hydroporus umbrosus</i>		ASSI	NNR	LNR
<i>Hygrotus quinquelineatus</i>	Nb	ASSI	NNR	LNR
<i>Hyphydrus ovatus</i>		ASSI		
<i>Ilybius aenescens</i>	Nb	ASSI	NNR	
<i>Ilybius ater</i>		ASSI	NNR	LNR
<i>Ilybius guttiger</i>	Nb	ASSI	NNR	
<i>Ilybius quadriguttatus</i>		ASSI	NNR	LNR
<i>Laccophilus minutus</i>		ASSI	NNR	LNR
<i>Limnebius truncatellus</i>		ASSI	NNR	LNR
<i>Noterus crassicornis</i>	Nb	ASSI	NNR	LNR
<i>Oreodytes sanmarki</i>		ASSI	NNR	
<i>Oulimnius tuberculatus</i>		ASSI	NNR	
<i>Potamonectes depressus</i>		ASSI		LNR

**E 51-100 post-1988 sites [16 species]**

<i>Agabus sturmi</i>		ASSI	NNR	LNR
<i>Anacaena lutescens</i>		ASSI	NNR	LNR
<i>Elmis aenea</i>		ASSI	NNR	LNR
<i>Gyrinus substriatus</i>		ASSI	NNR	LNR
<i>Haliphus ruficollis</i>		ASSI	NNR	LNR
<i>Helophorus aequalis</i>		ASSI	NNR	LNR
<i>Helophorus flavipes</i>		ASSI	NNR	LNR
<i>Hydrobius fuscipes</i>		ASSI	NNR	LNR
<i>Hydroporus erythrocephalus</i>		ASSI	NNR	LNR
<i>Hydroporus gyllenhali</i>		ASSI	NNR	LNR
<i>Hydroporus obscurus</i>		ASSI	NNR	LNR
<i>Hygrotus inaequalis</i>		ASSI	NNR	LNR
<i>Ilybius fuliginosus</i>		ASSI	NNR	LNR
<i>Limnius volckmari</i>				
<i>Noterus clavicornis</i>		ASSI	NNR	LNR
<i>Rhantus exsoletus</i>		ASSI	NNR	LNR

**F 100+ post-1988 sites [5 species]**

<i>Agabus bipustulatus</i>		ASSI	NNR	LNR
<i>Anacaena globulus</i>		ASSI	NNR	LNR
<i>Helophorus brevipalpis</i>		ASSI	NNR	LNR
<i>Hydroporus palustris</i>		ASSI	NNR	LNR
<i>Hydroporus pubescens</i>		ASSI	NNR	LNR

**X no post 1988 sites [13 species]**

<i>Agabus conspersus</i>	Nb			
<i>Gyrinus urinator</i>	Nb			

<i>Helophorus alternans</i>	Na
<i>Helophorus granularis</i>	
<i>Helophorus strigifrons</i>	Nb
<i>Hydraena minutissima</i>	Nb
<i>Hydraena pulchella</i>	RDB3
<i>Hydraena rufipes</i>	Nb
<i>Laccobius sinuatus</i>	
<i>Laccophilus hyalinus</i>	
<i>Limnebius nitidus</i>	Nb
<i>Ochthebius exsculptus</i>	Nb
<i>Rhantus suturalis</i>	Nb