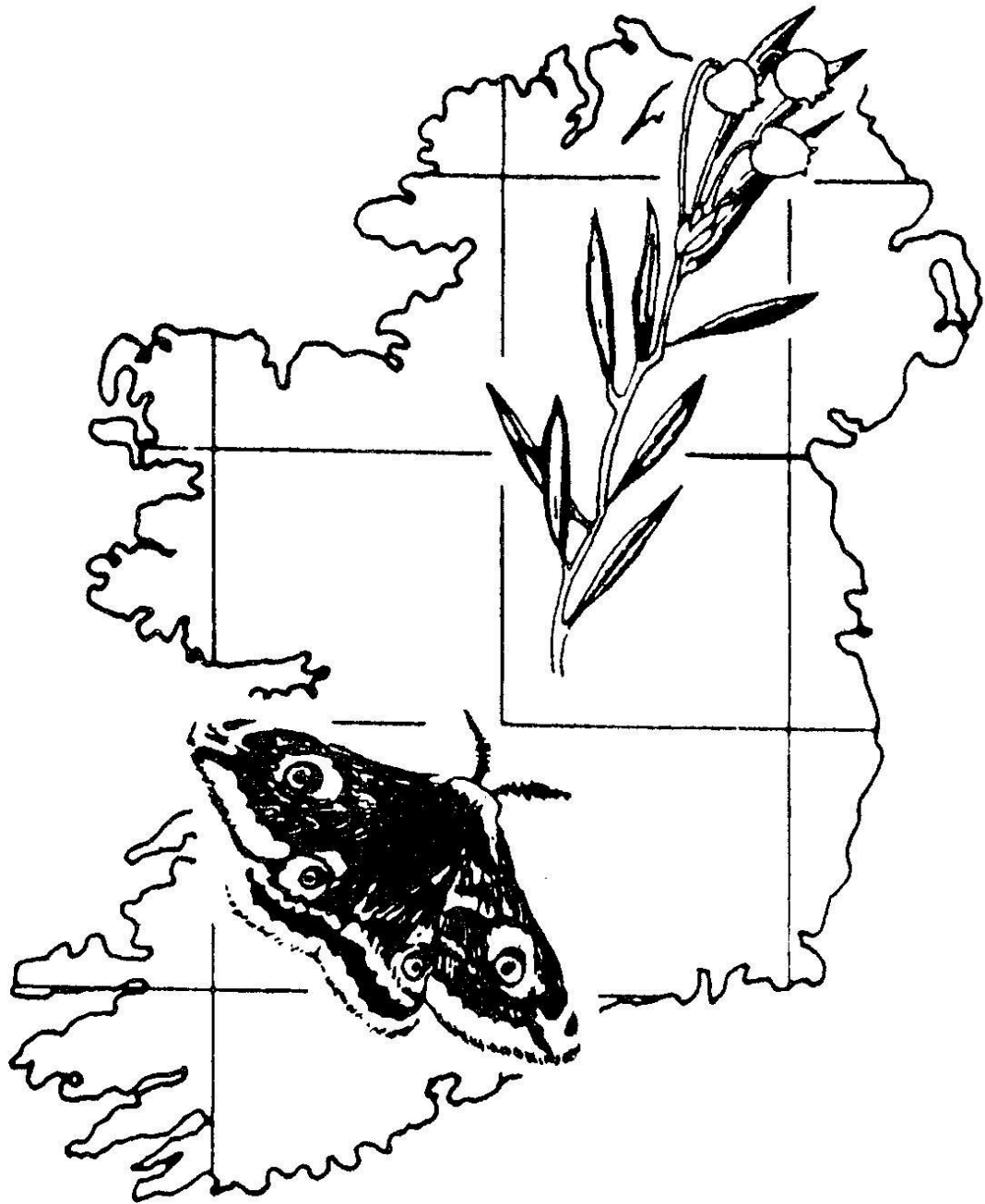


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# BULLETIN OF THE IRISH BIOGEOGRAPHICAL SOCIETY

Number 37

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## **EDITORIAL**

Happily, The Bulletin continues to thrive and this issue contains seventeen papers on a diverse range of topics including marine sand-dwelling copepods and the spiders of raised bogs. Numerous species are added to the fauna of Ireland while others are confirmed as Irish. The contents include an interesting article on the beetles in the James Tardy collection. This entomologist (1782-1835) assiduously collected insects in eastern Ireland in the early decades of the nineteenth century.

The first part of a landmark work on the distribution of the Irish Chironomidae appears in this Bulletin. Parts 2 and 3 will be published in Bulletins Nos 38 and 39 respectively. Afterwards, all the parts will be made available in a single pdf. The work is dedicated to the memory of E. J. Fittkau, 1927-2012. The senior author, Dr Declan Murray commenced his research on this group of non-biting midges in the nineteen sixties in University College Dublin. He became a renowned world-authority on these fascinating insects. The paper is mainly based on published information and records in his personal collections since that period and from his directed research with undergraduate and postgraduate masters, and doctoral students. The entire data base consists of 21,800 records of some 533 species.

Due to the generosity of our sponsors, the income from our members' subscriptions and the sale of publications, the Society has managed to break even in 2013 despite the size of the Bulletin and its associated printing costs. As a result, the membership will remain at €15 in 2014. The Bulletin continues to be made widely available world-wide.

The Committee is concerned at the age-profile of its members. In this context, we would entreat our members to each recruit one additional new member from the next generation.

On behalf of the Society, I wish to thank our sponsors for their essential support. Without it, the Society could not survive. We also wish to thank our referees who have often reviewed mss at short notice due to impending publication dates. Finally, many thanks to our authors whose zeal, diligence and expertise have made possible this Bulletin.

J. P. O'Connor, Editor, 31 October 2013

## **INSTRUCTIONS TO AUTHORS**

1. Manuscripts should follow the format of articles in this *Bulletin*. The titles of journals should be given in full in the references.
  
2. Manuscripts may be sent as typed copy on A4 paper, using double-spacing and 2.5cm (one inch) margins with the text and any figures also on an accompanying compact disc to the Editor, Dr J. P. O'Connor, emeritus entomologist, National Museum of Ireland, Kildare Street, Dublin 2, Ireland. Alternatively, mss may be submitted electronically *via* our Treasurer Mr John Walsh at <ampersandwalsh@gmail.com>.
  
3. Word is preferred and Times New Roman 13pt should be used.
  
4. Figures and tables should be submitted in a size suitable for reduction to A5 without loss of detail. It is important that the text should remain legible after reduction. JPEGs are preferred for figures.
  
5. Records: please ensure that, when possible, the following information is incorporated in each record included in a manuscript:-
  - (a) latin name of organism.
  - (b) statement of reference work used as the source of nomenclature employed in the text. The describer's name should be also given when a zoological species is first mentioned in the text.
  - (c) locality details including at least a four figure Irish grid reference (e.g. N3946), county or vice-county and some ecological data about the collection site, plus date of capture.
  - (d) Collector's name and determiner's name (where different from collector's name), and
  - (e) altitude data should be included where relevant.

## **RECORDS OF MARINE SAND-DWELLING COPEPODS (CRUSTACEA) FROM GALWAY BAY, INCLUDING EIGHT SPECIES NEW TO IRELAND**

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### **Abstract**

Shore samples were taken at Finavarra Point, Co. Clare, Ireland, and these yielded a diverse collection of marine sand-dwelling copepods (Crustacea). A total of two genera and eight species are new to Ireland. The identified material is listed.

**Key words:** marine records, additions, Ireland, copepods, Crustacea, Calanoida, Harpacticoida, Cyclopoida, Poecilostomatoida

### **Introduction**

Collections were made at a site near Finavarra (M241114), Co. Clare, on the south shore of Galway Bay. The precise location was on a south-facing exposed shore near the martello tower at Finavarra (sometimes spelt Finnavarra) Point. The upper shore was a boulder beach while the lower shore was wet fine sand with ripple-marks left by a receding tide, interspersed with occasional rocks and fragments of macrophytic algae.

Sampling consisted of taking a small (3cc) scraping of surface sand from the lower beach. Two collections were made, at the same place but on separate dates. The first was taken on 19 April 1990. As results looked promising, a second similar sample was taken on 13 May 1990.

Although the samples were small, they yielded a wide variety of sand-dwelling copepods (Crustacea), and these are listed. A total of two genera (*Schizopera*, *Stenocaris*) and eight species (*Ameira listensis* Mielke, *Parapseudoleptomesochra polychaeta* (Noodt), *Pseudoleptomesochrella halophila* (Noodt), *Psyllocamptus minutus* (G. O. Sars),

*Paraleptastacus spinicauda* (T. Scott and A. Scott), *Laophontina dubia* Norman and T. Scott, *Emertonia coelebs* (Monard), *Scottopsyllus minor* (T. Scott and A. Scott)) are new to Ireland. The new taxa are indicated by an asterix\* in the list.

The investigation of the marine interstitial copepod fauna of Ireland is still in its infancy. Notable studies were by O’Riordan (1971) and Bodin and Jackson (1989) but, unsurprisingly, even a small sample can reveal species rarely recorded in Ireland.

### **A list of the copepod species recorded from Finavarra, Co. Clare**

#### **CALANOIDA**

##### **Metridinidae**

##### ***Metridia lucens* Boeck, 1865**

1♀, 19 April 1990.

A common species in the plankton. The specimen was probably left behind by the receding tide and stranded in a ripple in the sand.

##### **Parapontellidae**

##### ***Parapontella brevicornis* (Lubbock, 1857)**

1♂, 13 May 1990.

A common species in the plankton. The specimen was probably left behind by the receding tide.

##### **Calanidae**

##### ***Calanus helgolandicus* (Claus, 1863)**

One specimen, 19 April 1990.

A common species in the plankton. The specimen was probably left by the receding tide.

#### **HARPACTICOIDA**

##### **Canuellidae**

##### ***Canuella perplexa* T. Scott and A. Scott, 1893**

1♂, 13 May 1990.

An infaunal sand-dweller, but perhaps too large to be considered truly interstitial.

### **Harpacticidae**

#### ***Harpacticus chelifera* (O. F. Müller, 1776)**

One specimen, 19 April 1990.

Phytal rather than interstitial. Probably from nearby fragments of macrophytic algae.

#### ***Harpacticus uniremis* Krøyer, 1842**

Several specimens, 13 May 1990.

A phytal species.

### **Dactylopusiidae**

#### ***Dactylopusia dissimilis* Brian, 1921**

Several specimens, 13 May 1990.

Phytal. Previous Irish records (e.g. Holmes and O'Connor, 1990) refer to this distinctive species as *Dactylopusia vulgaris* Sars, var. *dissimilis* Brian.

#### ***Diarthrodes major* (T. Scott and A. Scott, 1895)**

2♀♀, 13 May 1990.

Phytal.

### **Miraciidae**

#### ***Amphiascoides debilis* (Giesbrecht, 1881)**

1♂♂, 19 April 1990; 2♂♂ 3♀♀, 13 May 1990.

Phytal rather than interstitial.

#### ***Paramphiascella vararensis* (T. Scott, 1903)**

1♂♂, 13 May 1990.

A shallow-water benthic species.

#### **\**Schizopera* sp.**

**Genus new to Ireland**

2♀♀, 19 April 1990.

Sand-dweller. The identity of these specimens remains a mystery. They are most similar to *Schizopera gauldi* Chappuis and Rouch (1961), known only from Ghana, but differ in detail.

Possibly they represent an undescribed species.

### **Thalestridae**

#### ***Parathalestris clausi* (Norman, 1868)**

Four specimens, 19 April 1990.

A common and abundant littoral and phytal species.

#### ***Parathalestris hibernica* (Brady and Robertson, 1873)**

1 ♀, 19 April 1990.

A phytal species.

#### ***Parathalestris irelandica* Roe, 1958**

Four specimens, 19 April 1990; four specimens, 13 May 1990.

Phytal.

### **Ameiridae**

#### **\**Ameira listensis* Mielke, 1973**

**New to Ireland**

1 ♀, 13 May 1990.

Interstitial.

#### ***Nitocra typica* Boeck, 1865**

1 ♂, 19 April 1990.

A common and abundant littoral species.

#### **\**Parapseudoleptomesochra polychaeta* (Noodt, 1952)**

**New to Ireland**

1 ♀, 19 April 1990.

Interstitial.

#### **\**Pseudoleptomesochrella halophila* (Noodt, 1952)**

**New to Ireland**

1 ♀, 19 April 1990.

Interstitial.

#### **\**Psyllocamptus minutus* (G. O. Sars, 1911)**

**New to Ireland**

1 ♀, 13 May 1990.

Interstitial.

**Cylindropsyllidae**

\**Stenocaris* sp.

**Genus new to Ireland**

2♀♀, 13 May 1990.

Interstitial. Lacking a male, the available material does not allow identification to species.

**Leptastacidae**

*Leptastacus laticaudatus* Nicholls, 1935

1♂, 13 May 1990.

Interstitial.

*Paraleptastacus espinulatus* Nicholls, 1935

1♀, 13 May 1990.

Interstitial.

\**Paraleptastacus spinicauda* (T. Scott and A. Scott, 1895)

**New to Ireland**

2♂♂, 13 May 1990.

Interstitial.

**Leptopontiidae**

*Leptopontia flandrica* Huys and Conroy-Dalton, 1996

1♀, 13 May 1990.

Interstitial. The Finavarra specimen was mentioned by Huys and Conroy-Dalton (1996) in their paper in which the species was described.

**Cletodidae**

*Enhydrosoma propinquum* (Brady, 1880)

1♀, 13 May 1990.

An infaunal sand and silt dweller.

**Rhizotrichidae**

*Rhizothrix curvatum* (Brady, 1880)

1♀, 13 May 1990.

An infaunal sand dweller.

***Rhizothrix minuta* (T. Scott, 1903)**

7♀♀, 13 May 1990.

Infaunal sand dweller.

**Laophontidae**

***Asellopsis hispida* Brady and Robertson, 1873**

4♀♀, 13 May 1990.

Littoral sand-dweller.

***Asellopsis intermedia* (T. Scott, 1895)**

1♀, 13 May 1990.

Sand-dweller.

***Heterolaophonte minuta* (Boeck, 1873)**

4♀♀, 19 April 1990; 1♂ 3♀♀, 13 May 1990.

Normally regarded as a brackish or estuarine species.

***Laophonte setosa* Boeck, 1865**

2♂♂, 13 May 1990.

A common littoral species.

**\**Laophontina dubia* Norman and T. Scott, 1905**

**New to Ireland**

1♀, 13 May 1990.

Interstitial. *Laophontina dubia* is known from Anglesey and Scilly around Great Britain, from Brittany in France and from Sardinia in the Mediterranean (Fiers, 1991).

***Paralaophonte congenera* (G. O. Sars, 1908)**

1♂, 13 May 1990.

A common littoral species.

***Pseudolaophonte* sp.**

1♂ 9♀♀, 19 April 1990; 1♀, 13 May 1990.

Interstitial. The specimens cannot be assigned to *P. spinosa* (Thompson), the only member of the genus recorded from Ireland.



**Orthopsyllidae**

***Orthopsyllus linearis* (Claus, 1866)**

1 ♀, 13 May 1990.

A common littoral species.

**Ectinosomatidae**

***Arenosetella tenuissima* (Klie, 1929)**

Four specimens, 19 April 1990.

A common and abundant interstitial species.

***Ectinosoma tenuipes* T. Scott and A. Scott, 1896**

1 ♀, 13 May 1990.

Interstitial.

***Pseudobradya minor* (T. Scott and A. Scott, 1896)**

5 ♂♂ 4 ♀♀, 13 May 1990.

Interstitial.

**Paramesochridae**

**\**Emertonia coelebs* (Monard, 1935)**

**New to Ireland**

1 ♂, 13 May 1990.

Interstitial. *Emertonia coelebs* (until recently known as *Kliopsyllus coelebs*) has been recorded from Exmouth and Anglesey around Great Britain, Brittany in France and in the Mediterranean (Wells, 1986).

***Scottopsyllus herdmani* (I. C. Thompson and A. Scott, 1900)**

1 ♀, 13 May 1990.

Interstitial.

**\**Scottopsyllus minor* (T. Scott and A. Scott, 1895)**

**New to Ireland**

Several, 13 May 1990.

Interstitial.

## **CYCLOPOIDA**

### **Cyclopinidae**

#### ***Cyclopina brachystylis* G. O. Sars, 1921**

4♀♀, 13 May 1990.

## **POECILOSTOMATOIDA**

### **Macrochironidae**

#### ***Macrochiron fucicolum* Brady, 1872**

1♀, 13 May 1990.

An invertebrate associate. The above specimen was recorded previously in Holmes and Gotto (1992) in a check-list of the poecilostomatoid copepods of Ireland, where it was inadvertently listed under Co. Galway.

### **Pseudanthessiidae**

#### ***Pseudanthessius gracilis* Claus, 1889**

1♂, 13 May 1990.

An invertebrate associate. The above specimen was recorded previously in Holmes and Gotto (1992).

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**FIRST RECORDS OF *HEMINOTHRUS (CAPILLONOTHRUS) THORI* (BERLESE, 1904) AND *PERLOHMANNIA (PERLOHMANNIA) DISSIMILIS* (HEWITT, 1908) (ARACHNIDA: ACARI: ORIBATIDA) IN IRELAND**

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**Abstract**

In this paper we present the first records for Ireland of *Heminothrus (Capillonothrus) thori* (Berlese, 1904) and *Perlohmannia (Perlohmannia) dissimilis* (Hewitt, 1908), both mites belonging to the suborder Oribatida. Both species were recovered from riparian habitats along the River Liffey in Co. Kildare and, in addition to providing number of individuals and precise location of the records, some comments on the biogeography and biology of these species are presented.

**Key words:** *Heminothrus (Capillonothrus) thori*, *Perlohmannia (Perlohmannia) dissimilis*, Acari, Oribatida, riparian, first records, Ireland

**Introduction**

Riparian habitats are unique ecosystems that are located along the banks of rivers and other water networks, between the water mark and the portion of land above the high water mark where vegetation, soil, invertebrates, and wildlife are influenced by occasional inundation (Naiman *et al.*, 1993). Natural riparian zones are some of the most diverse, dynamic and complex biophysical terrestrial habitats (Naiman *et al.*, 1993) and their vegetation support a huge abundance of invertebrates (Gregory *et al.*, 1991). Arthropods, both aquatic and terrestrial, are dependent on these habitats for feeding, resting, refuge and reproduction. These organisms

in turn provide a critical resource base for many wildlife species such as birds, fish and other invertebrates (Doyle, 1990; Gray, 1993). There is very little knowledge of the invertebrate fauna inhabiting these habitats in Ireland and this is especially true of the mites.

Oribatids belong to the mite suborder Oribatida or Cryptostigmata and are mainly soil living decomposers present in almost all habitats, their distribution ranges from arid coniferous forests to floodplain forests, canopies and even salt marshes, with a few species adapted to life in aquatic environments. Oribatid mites consist of approximately 10,000 described species worldwide (Subías, 2004, updated 2012).

### **Material and methods**

Several sites were sampled from the riparian zone of the River Liffey in Co. Kildare. Sampling plots (4m x 4m) were located along the river and each contained a square grid of nine pitfall traps placed to sample invertebrate soil fauna, i.e. each 2m from each other and 2m from the water's edge. The samples were collected over a two week period between 14 and 29 April 2011.

The mites, once recovered from the pitfall traps, were slide mounted using Hoyer's medium and identified using Balogh and Balogh (1992), Balogh and Mahunka (1983) and Weigmann (2006). Voucher specimens are deposited in the School of Biology and Environmental Science, University College Dublin, Ireland.

### **Results and discussion**

*Heminothrus (Capillonothrus) thori* (Berlese, 1904) (= *Nothrus crinitus* Warburton and Pearce, 1905) and *Perlohmannia (Perlohmannia) dissimilis* (Hewitt, 1908) were found in the traps and are the first records for Ireland. Neither was reported in the checklist of Luxton (1998) for Irish Cryptostigmata and Mesostigmata mites, nor in later works carried out in Ireland.

One individual of *H. (C.) thori* was found at Old Manor Abbey (Latitude 53° 09' 773' 'N and Longitude 06° 46' 350' ' W) in one of the pit fall traps closest to the river. The species is mainly

found in wet and moist forests according to Weigmann (2006). More precisely, it can be defined as hygrophilous, silvicolous and tyrophobic. *H. (C.) thori* has a Holarctic and Oriental distribution (Palearctic: frequent; Nearctic: more frequent in the Northern and Eastern Nearctic and Orient: South East China and India).

Finding oribatids in wet habitats such as the riparian is not surprising as several species have even been recorded in springs (i.e. see Willmann (1932), Franz (1954) or Schatz and Gerecke (1996)). Recently, *H. (C.) thori* was collected (and reported as *Platynothrus thori*) from several springs in the Trentino Region (Northern Italy) by Gerecke *et al.* (2009). This species is an example of the many terrestrial species of oribatid that can be found in aquatic habitats, either as chance stragglers from the surrounding habitats, or from periodic or unpredictable flooding, where they can survive for long periods. Most of the mites found associated with springs seem to belong to the moss fauna of the moist surrounding area or to be washed in from trees. Only a few oribatid species are truly aquatic, reproducing and having all stages of their life-cycle in the aquatic habitat.

*H. (C.) thori* has been recorded in Britain (Luxton, 1996). Another congeneric species, *Heminothrus (Platynothrus) peltifer* (Koch, 1839) was the most abundant of the oribatid mites recovered from the riparian sites studied. This latter species is known to prefer to inhabit moist habitats such as forests and wetlands, but is very widely distributed and was, for example, one of the most abundant mites collected in a previous study made in Irish peatlands and bogs (Wisdom *et al.*, 2011).

Three individuals of *Perlohmannia (P.) dissimilis* were found in a site located at Kilcullen (Latitude 53° 08' 037' ' N and Longitude 06° 44' 633' ' W). This species occurs mainly on forest floors, on the soil surface and in moss. It is considered meso-hydrophilic (Weigmann, 2006). *P. (P.) dissimilis* has a Palearctic and Oceanian distribution (Central and South Europe, Western Central Asia and east of Asian Russia and Hawaii.) and has already been recorded in Britain (Luxton, 1996).

*P. (P.) dissimilis* was firstly described by Hewitt (1908) as *Lohmannia insignis* Berl. var.

*dissimilis*, but later in 1916 Berlese created the new genus *Perlohmannia* for the two *Lohmannia* species with *insignis* as the type species while the variety *dissimilis* was promoted to the full rank of species. Of the nine species currently placed in the genus *Perlohmannia* (*Perlohmannia*) Berlese, 1916, only the type species, *P. (P.) insignis* (Berlese, 1904) had previously been recorded in Ireland. It was described by Berlese, based on Irish specimens sent to him by J. N. Halbert (see more details in Grandjean (1958)), and was later reported by Carpenter (1905) in samples from a garden in Co. Dublin.

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**CONFIRMATION OF THE PRESENCE OF THE SMALL SKIPPER BUTTERFLY  
*THYMELICUS SYLVESTRIS* (PODA, 1761) (LEPIDOPTERA: HESPERIIDAE) IN  
IRELAND**

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**Abstract**

*Thymelicus sylvestris* (Poda, 1761) is confirmed to be present in Ireland.

**Key words:** *Thymelicus sylvestris*, Lepidoptera, small skipper, Ireland

**Introduction**

In July 2011, while on a field trip of The Dublin Naturalists' Field Club to peatlands in the Timahoe-Drehid area of Co. Kildare, a single orange-coloured lepidopteran was observed by one of us (NL) and photographed in proximity to an abandoned Bord na Móna (BNM) industrial railway formerly used for the transport of peat as fuel for the Allenwood electricity generating station. Later in the year, analysis of the single photograph taken, led to the conclusion that the insect was a skipper, either *Thymelicus lineola* (Ochsenheimer, 1808) or *T. sylvestris* (Poda, 1761), with a very high probability that it was the latter (Nash *et al.*, 2012). It was decided to carry out further investigations in 2012 to confirm its identity.

**Methods**

In 2012, from early July, approximately weekly visits were made to the BNM railway corridor in search of skippers. On 10 August, *circa* 30 were observed both north and south of the road between Drehid Cross and Timahoe Cross at Drumachon (Irish Grid Reference N748330). Close examination of netted insects confirmed that all of the butterflies seen were

indeed the small skipper. The two key confirmatory features are the brown colour of the underside of the tips of the antennae and the extent and the position of the dark sex brand on the forewing of males relative to the veins. Males and females were seen in approximately equal numbers. Visits were made to the general area with a view to ascertaining the extent of colonisation and to investigate other branches of the abandoned rail network. Smaller numbers of skippers were observed on subsequent visits up to 26 August.

### **Conclusion and discussion**

It was concluded that the small skipper was present at low density along the railway corridor for a distance of approximately 2.5km, generally in open sunny areas. The railway was elevated above the surrounding bog in places by the addition of gravel, and ash from a peat power station. Subsequently, part of the neighbouring bog surface was lowered by peat extraction. In some areas on the edge of the bog, a substantial amount of marl had been deposited resulting in soil suitable for a diversity of calcicole vascular plants. The main grasses present included: *Holcus lanatus* Linnaeus, 1753; *Arrhenatherum elatius* (Linnaeus, 1753) P. Beauvois ex J. Presl and C. Presl, 1819; *Dactylis glomerata* Linnaeus, 1753; *Festuca rubra* Linnaeus, 1753; *Agrostis stolonifera* Linnaeus, 1753; *Anthoxanthum odoratum* Linnaeus, 1753; with lesser amounts of *Phleum pratense* Linnaeus, 1753. *H. lanatus* is said to be the major larval food plant of this skipper. The skippers were generally found in areas where nectar sources such as *Trifolium pratense* Linnaeus, 1753; *Cirisium palustre* (Linnaeus) Scopoli, 1772; *Centaurea nigra* Linnaeus, 1753; *Vicia sepium* Linnaeus, 1753 and *Epilobium hirsutum* Linnaeus, 1753 were in abundance.

The origin and arrival of the small skipper in Ireland is currently obscure and it is not known whether its introduction was deliberate or accidental but the amount of potentially suitable habitat in this part of Co. Kildare suggests that it should be capable of being widely distributed. This skipper is plentiful in southern Britain but it is considered unlikely that it was self-propelled to Ireland. The Essex skipper may have arrived in Ireland in hay imported for equine

purposes, paralleling its spread across North America in the early twentieth century. However, there have been no reports of a similar mode for the dispersal of the small skipper. The two skipper species are not readily distinguishable in the field.

Previously, the small skipper was reported in error from Co. Wexford (Wilson *et al.*, 2009). Harding (2008) declared its presence in Co. Kildare since 2005 and subsequently (pers. comm. 2010) revealed that the site was “sensitive” and was in the north of the county.

Voucher specimens (NMINH:2012.85.1 male; NMINH:2012.85.2 female) have been lodged in the National Museum of Ireland, Dublin.

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**A REVIEW OF THE IRISH SCELIONIDS (HYMENOPTERA: PLATYGASTROIDEA, PLATYGASTRIDAE) INCLUDING FOUR SPECIES NEW TO IRELAND**

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**Abstract**

The Irish scelionid (Hymenoptera: Platygastroidea, Platygastriidae) fauna is reviewed. Four species are added to the fauna: *Telenomus vibius* Walker, 1838, *Trimorus elongatus* (Kieffer, 1908), *Trimorus opacus* (Thomson, 1859) and *Trimorus rufonotatus* (Kieffer, 1908). In total, 52 species are now known from the island.

**Key words:** scelionids, Hymenoptera, Platygastriidae, Ireland, fauna, review, additions

**Introduction**

Scelionids are normally very small to small insects (*circa* 1-2.5mm long), some with the body distinctly sculptured and the gaster strongly scelotized. Colouration is mainly black but sometimes yellow or multicolored but rarely metallic. There is a submarginal vein in the forewing and it usually reaches the anterior margin to continue as a marginal vein. The stigma and often the postmarginal veins are present.

They are endoparasitoids in insect and spider eggs. The majority are solitary parasitoids i.e. one wasp completes its development in one host egg. However, a few telenomines that attack large lepidopteran eggs are known to be gregarious with five to ten wasps completing their development in a single host egg (Notton, 2006). Phoresy is known in the group. Adult females

attach themselves to the female of the host species and cling tightly to her until ovipositing. Then the parasitoid leaves the body and attacks the eggs.

Scelionids were in their own family (Scelionidae) but at present are included in the Platygasteridae. While the monophyly of the Platygastroidea is undisputed, the Scelionidae are not defined by any unique synapomorphy and the family is possibly paraphyletic (Austin *et al.*, 2005; Murphy *et al.*, 2007).

Alexander Henry Haliday carried out the most important research on the Irish scelionids and (1833) described several species new to science based on Irish material but at the time gave no locality data. Subsequently, Walker (1836) provided the relevant details as well as describing additional new species based wholly or in part on Haliday specimens. Further information on Haliday will be found in Nash and O'Connor (2011). The group was then almost completely neglected in Ireland until the last ten years when new research commenced on the Irish fauna.

The Irish species were catalogued by O'Connor, Nash, Notton and Fergusson (2004) and subsequently the checklist updated by O'Connor, Nash and Broad (2009). Four species are added to the fauna in this paper: *Telenomus vibius* Walker, 1838, *Trimorus elongatus* (Kieffer, 1908), *Trimorus opacus* (Thomson, 1859) and *Trimorus rufonotatus* (Kieffer, 1908). The specimens were identified using Kozlov (1988) and then checked in Konovova and Kozlov (2001). Because of the large number of species described from Northern and Southern Europe which are not represented in these volumes, only specimens which keyed out definitely have been included. These named specimens are deposited in the National Museum of Ireland which now holds a representative collection of the Irish fauna. In total, 52 species are presently known from Ireland.

Comparison with the British fauna is difficult as the list compiled by Fergusson (1978) is considerably out of date. However, 20 of the 52 Irish species have not been recorded from Britain while 14 have not been reported from outside the British Isles (Table 1). Altogether, six species are known only from Ireland. Of these, five were described in the eighteen thirties while one was only recently described. Of the former, only *Telenomus phylis* has been rediscovered

in Ireland.

The following abbreviations are used in the text: AHH - A. H. Haliday; AWS - A. W. Stelfox; GM - G. Mineo; BMNH - the Natural History Museum, London (formerly British Museum, Natural History); JPOC - J. P. O'Connor; MAOC - M. A. O'Connor; NMI - National Museum of Ireland.

## **The Irish scelionids**

### **SCELIONINAE**

#### ***Anteris asramanes* (Walker, 1836)**

**DUBLIN:** St Anne's [Park] (O2137), Clontarf, ♀ 29 November 1924, E. O'Mahony (BMNH) (Notton, 2006).

The host is unknown but the species shows an association with mature trees. In Britain, females have been found in most months of the year with peaks in August and September. By contrast, males have only been found during August and September. Outside the British Isles, the species has been recorded from Bulgaria, Denmark, France, Germany, Hungary and Spain (Notton, *op. cit.*)

#### ***Baeus seminulum* Haliday, 1833**

**GALWAY:** Galway (M2925), collected in new mown meadows, during August, AHH (Walker, 1836). **KERRY:** Ross (V9588), Killarney, ♀ August 1933, E. F. Bullock (O'Connor, 2006).

The hosts are spider eggs belonging to the families Argiopidae and Theridiidae (Kozlov, 1988). The species is known from Austria, Belgium, Denmark, Finland, France, Germany, Great Britain, Greenland, Italy, Moldavia, Portugal (The Azores), Sweden and Russia (Buhl, 1995; Pintureau and al-Nabhan, 2003; Johnson, 2013a).

#### ***Gyron misellum* Haliday, 1833**

**DOWN:** Holywood (J4079), AHH (Walker, 1836). **GALWAY:** Galway (M2925), AHH (Walker, 1836). **KERRY:** Hog's Head, Waterville, ♀ 13 July 1994 (Pintureau and Al-Nabhan, 2003). **WEXFORD:** Curracloe (T1127), swept from vegetation on the sand-dunes, ♂ 7 August

2009, JPOC (O'Connor and Mineo, 2013).

The host is unknown. *Gyron misellum* is widely distributed in Europe and also occurs in Azerbaijan, Turkey, North America and Australia (Kononova and Kozlov, 2008; O'Connor and Mineo, in press).

***Scelio vulgaris* Kieffer, 1908**

**WICKLOW:** Kilmacanoge (O2514), collected in an alder *Alnus* marsh beside a stream, 15 August 1982, JPOC and MAOC (O'Connor *et al.*, 2004).

The hosts are the eggs of various species of grasshoppers (Orthoptera: Acrididae) including the lesser marsh grasshopper *Chorthippus albomarginatus* (De Geer, 1773) which occurs in Ireland (Kononova and Kozlov, 2001). Johnson (2013a) reports it from Austria, Denmark and Italy including Sicily while Kononova and Kozlov (2008) add Azerbaijan, Georgia and Turkey.

***Thoron metallicus* Haliday, 1833**

**DOWN:** Holywood (J4079), at the edges of ponds, among the roots of aquatic plants and on the water, AHH (Walker, 1836). **DUBLIN:** Furry Glen, Phoenix Park (O1036), 10 May 1939, AWS (BMNH); Glenasmole (O1019), 31 August 1937, AWS (BMNH); Gollierstown (O0132), 6 October 1946 and 3 August 1947, AWS; Landenstown (N8524), 25 September 1949, AWS; Luttrellstown (O0337), swept from vegetation beside the Royal Canal, ♀ 28 September 1986, JPOC and MAOC (O'Connor *et al.*, 2004). **KILDARE:** Castledermot (S7784), 5 September 1937, AWS (BMNH); Kilkea Park (S7488), September 1937, AWS (BMNH); Rye Water (O0036), 20 July 1941, AWS (BMNH). **KILKENNY:** Tinnahinch (S7143), 26 October 1926, R. A. Phillips (BMNH). **WICKLOW:** Kilmacrea Pass (T2385), 25 September 1938, AWS (BMNH).

A description of the lectotype was provided by Mineo, O'Connor and Ashe (2010). *Thoron metallicus* parasitizes the eggs of the water scorpion *Nepa cinerea* L. (Hemiptera: Nepidae) (Kononova and Kozlov, 2001). It is interesting to note that Curtis (1823-1840) in his text for plate 333 of *Teleas elatior* mentions Haliday taking *T. metallicus* among Junci on the banks of stagnant pools, and in the water, July 31st. Mineo (2003) and Johnson (2013a) report it from

Britain, Denmark, Finland, Germany, Italy, Russia, Sweden, the Czech Republic and the Ukraine while Kononova and Kozlov (2008) add Azerbaijan, Moldova, Hungary, North America and Turkey.

***Tiphodytes gerriphagus* (Marchal, 1900)**

**CARLOW:** River Barrow at Saint Mullins (S7238), swept from vegetation, ♂ 5 August 2010, JPOC (O'Connor, 2013). **WEXFORD:** Oaklands Wood, man-made angling lake (S7125), reared from aquatic eggs collected 4 August 2009, ♂2♀♀ emerged *circa* 29 August 2009, JPOC (O'Connor, Ashe and Mineo, 2011).

*Tiphodytes gerriphagus* attacks the eggs of waterstriders (Hemiptera: Gerridae) and its biology has been well studied (see Mineo, O'Connor and Ashe, 2009). The species is widespread in the Holarctic (O'Connor, Ashe and Mineo, 2011).

**TELEASINAE**

***Teleas clavicornis* (Latreille, 1805)**

**DOWN:** Holywood (J4079) from May to September, AHH (Walker, 1836).

The host is unknown. Very little is known about the biology of *Teleas* spp. as it is a rare and poorly collected genus. Telenga (1959) observed specimens of *T. rugosus* Kieffer, 1908 emerging from the eggs of several species of ground beetles (Coleoptera: Carabidae). Most carabids lay their eggs in the soil and the large mandibles and spinose legs of *Teleas* are used for digging in the soil to reach host eggs (Sharkey, 1981). There are also records from Britain, Denmark, Finland, France and Germany (Johnson, 2013a).

***Teleas pulex* Walker, 1836**

**DOWN:** Holywood (J4079), AHH (Walker, 1836).

The host is unknown and the species, apparently, only recorded from Ireland.

***Trimorus aegle* (Walker, 1836)**

**DOWN:** Holywood (J4079), AHH (Walker, 1836).

The host is unknown. Most hosts of *Trimorus* are unknown but species belonging to the



genus have been reported as parasitoids in the eggs of ground beetles (Coleoptera: Carabidae) (Petrov, 2012). However *Trimorus fulvimanus* (Kieffer, 1980) has been recorded as an egg parasite of the rove beetle *Acylophorus wagenschieberi* Kiesenwetter (Coleoptera: Staaphylinidae) (Staniec, 2005).

Walker (1836) also reported the species from London.

***Trimorus apricans* (Walker, 1836)**

**DOWN:** Holywood (J4079), on sandy banks, AHH (Walker, 1836).

The host is unknown and the species, apparently, only recorded from Ireland.

***Trimorus aratus* (Walker, 1836)**

**DOWN:** Holywood (J4079), AHH (Walker, 1836).

The host is unknown. Walker (1836) also reports the species from near London and North Wales.

***Trimorus bacilliger* (Kieffer, 1908)**

**CLARE:** near the Rathborne River (M2105), The Burren, ♂ 16 July 1981, JPOC and MAOC (O'Connor and Mineo, 2008).

The host is unknown. The species has also been recorded from Scotland (Kieffer, 1908).

***Trimorus elatior* Haliday in Curtis, 1830**

**IRELAND:** no locality given, in marshes, AHH (Walker, 1836).

The host is unknown. Walker (1836) also recorded the species from England, France and Scotland.

***Trimorus elongatus* (Kieffer, 1908)**

**New to Ireland**

**CORK:** Glengarriff Woods (V9256), swept from oak *Quercus* woodland, ♀ 7 July 1985, JPOC and MAOC (det. JPOC).

The host is unknown. Kononova and Kozlov (2001) and Mineo (2003) report the species from England, Georgia, Italy, Moldova and the maritime region of Russia.

***Trimorus ephippium* (Walker, 1836)**

**DOWN:** Holywood (J4079), on grass under trees, July, AHH (Walker, 1836).

The host is unknown. Kononova and Kozlov (2001) report the species from Bulgaria, England, Hungary and Russia.

***Trimorus flavipes* (Walker, 1836)**

**DOWN:** Holywood (J4079), on grass under trees, September, AHH (Walker, 1836).

The host is unknown. Kononova and Kozlov (2001) report the species from Bulgaria, England, Finland, Russia, Sweden and the Ukraine.

***Trimorus lamus* (Walker, 1836)**

**DOWN:** Holywood (J4079), on grass under trees, AHH (Walker, 1836).

The host is unknown and the species, apparently, only recorded from Ireland.

***Trimorus opacus* (Thomson, 1859)**

**New to Ireland**

Synonym *Trimorus pedestris* (Nees, 1834) *sensu* Kononova and Kozlov, 2001

**KERRY:** Bunror (Bunrower) (V9588), Killarney, ♀ March 1935, E. F. Bullock (NMI) (det. JPOC).

The specimen was identified as *Trimorus pedestris* (Nees, 1834) using Kozlov (1988) and Kononova and Kozlov (2001). However, Graham (1988), after examining original pencil drawings of *Teleas pedestris* Nees, 1834, by Nees in the University Museum, Oxford, showed that it appeared to belong to the genus *Gyron* Haliday. *Prosacantha opaca* Thomson, 1859 is given as a synonym by Kononova and Kozlov (2001). Since *Trimorus opacus* (Thomson, 1859) is considered a valid name by Johnson (2013a, b), that name is used for the Killarney taxon. The host is unknown. Johnson (2013a) reports the species from Denmark, Finland and Sweden. In addition, Fergusson (1978) lists *Trimorus pedestris* from Britain while Kononov and Kozlov (2001) describes the distribution as Palaearctic.

***Trimorus paula* (Walker, 1836)**

**DOWN:** Holywood (J4079), AHH (Walker, 1836).

The host is unknown. Walker (1836) also recorded the species from the following British localities: Devonshire, near London, North Wales and the Isle of Wight.

***Trimorus procris* (Walker, 1836)**

**DOWN:** Holywood (J4079), AHH (Walker, 1836).

The host is unknown. Walker (1836) also recorded the species from near London and the Isle of Wight.

***Trimorus rufonotatus* (Kieffer, 1908)**

**New to Ireland**

**TYRONE:** Knockmany Forest (H5455), ♀ 15 May 1983, M. Boston (det. JPOC).

The host is unknown. Kononova and Kozlov (2001) report the species from Austria, England, Germany, Sweden and the Ukraine.

***Trimorus sectigena* (Kieffer, 1908)**

**CORK:** Glengarriff Woods (V9256), swept in oak *Quercus* woodland, ♀ 12 July 1985, JPOC and MAOC (O'Connor and Mineo, 2008).

The host is unknown. The species is also recorded from Italy (Kieffer, 1908).

***Trimorus therycides* (Walker, 1836)**

Synonym *Trimorus doto* (Walker, 1836)

Synonym *Trimorus mermerus* (Walker, 1836).

**DOWN:** Holywood (J4079), AHH (Walker, 1836).

The host is unknown. Johnson (2013a) reports the species from Bulgaria, Denmark, Iceland, Moldova and the Ukraine. However, Walker (1836) also recorded *Trimorus therycides* and *T. mermerus* from France and several localities in Britain, and *T. doto* from London.

***Trimorus timareta* (Walker, 1836)**

**DOWN:** Holywood (J4079), AHH (Walker, 1836).

The host is unknown. Walker (1836) also recorded the species from England and France.

***Trimorus tuberculatus* (Kieffer, 1908)**

**CLARE:** Fanore (M1308), swept from sand-dunes, ♂ 31 July 1988, JPOC (O'Connor and Mineo, 2008).

The host is unknown. The species is also recorded from Italy (Kieffer, 1908).

***Trimorus varicornis* (Walker, 1836)**

**DOWN:** Holywood (J4079), AHH (Walker, 1836). **MAYO:** Clare Island, ♀ July 1910, C. Morley (O'Connor, in press, b).

The host is unknown. Kononova and Kozlov (2001) report the species from Bulgaria, England, Finland, France, Italy, Hungary, Russia, Sweden and the Netherlands.

***Xenomerus canariensis* Huggert, 1979**

Synonym *Xenomerus hibernicus* Mineo and O'Connor, 2009

**DUBLIN:** Phoenix Park (O0936), ♂ 10 September 1995, V. Fursov (Mikó, Masner and Deans, 2010). **MEATH:** Thomastown Bog (O0068), Malaise trap, 4♀♀ 9-13 September 1997, C. Ronayne (Mineo, O'Connor and Ashe, 2011). **WEXFORD:** Ballyteige (S9504), swept from vegetation on the sand dunes, ♀ 2 July 1991, JPOC; Craywell, New Ross (S7228), swept from an overgrown area in a small public park on a steep hill, ♀ 3 August 2008, JPOC; Curracloe (T1128), swept from vegetation on the sand-dunes, ♂ 30 July 2008, JPOC (all Mineo and O'Connor, 2009); Stoneyford near Broadway (T1009), Malaise trap in an overgrown area set aside for wildlife, 2♂♂3♀♀ 12-21 August 1993, JPOC (Mineo, O'Connor and Ashe, 2011). **WICKLOW:** Blackditch Wood (O3003), Malaise trap, ♂ 20 June- 11 July 1990, R. E. Blackith and R. M. Blackith (O'Connor *et al.*, 2004 misidentified as *Xenomerus ergenna*); Russelstown Park (N9610), 2♂♂♀ 8 September 1995, V. Fursov (Mikó, Masner and Deans, 2010).

Because of the host record of *Xenomerus ergenna*, *X. canariensis* is likely to be a parasitoid of some aboreal carabid (Coleoptera) (Bin, 1983). The species is widely distributed in Europe and has also been found in Kenya, Nepal, South Africa and Zimbabwe (Mikó, Masner and Deans, 2010).

***Xenomerus ergenna* Walker, 1836**

Synonym *Trimorus curtum* Kononova and Petrov, 1999

**WICKLOW:** ♀ “Paratype *Trimorus curtum* K.K.”, Russelstown Park, Blessington, 8 September 1995, V. Fursov (Kononova and Petrov, 1999 as *Trimorus curtum*; Mikó, Masner and Deans, 2010). The grid reference for Russelstown Park is N9610.

Mikó, Masner and Deans (2010) also give an erroneous record under “IRELAND” viz. 1♀ “B.M. TYPE HYM 9.906, *Teleas medon*, Stood under this name in old B. M. Collection (Rearranged 1928 J. W.)”. This refers to a type specimen of *Teleas medon* Walker, 1836. However, Walker (1836) states that the species was collected in October near London.

*Xenomerus ergenna* were reared from the eggs of a ground beetle *Dromius* sp. (Coleoptera: Carabidae) (Bin, 1983). It is widely distributed in Europe and also occurs in India, Japan and South Korea (Mikó, Masner and Deans, 2010).

## **TELENOMINAE**

### ***Telenomus andria* Walker, 1836**

**DOWN:** Holywood (J4079), AHH (Walker, 1836). **WATERFORD:** Dunmore East, coastal cliffs at Black Knob (X6999), ♀ 7 August 2008, JPOC (Mineo, O’Connor and Ashe, 2011).

**WEXFORD:** Curracloe (T1127), swept from the sand-dunes, ♀ 30 July 2008 and ♀ 7 August 2009, JPOC (O’Connor and Mineo, 2013).

The host is unknown. Outside Ireland, the species has been recorded from Britain (O’Connor and Mineo, *op. cit.*; Johnson, 2013a).

### ***Telenomus brachialis* Haliday, 1833**

**DOWN:** Holywood (J4079), AHH (Walker, 1836).

The host is unknown. The species is also reported from North Wales (Walker, 1836).

### ***Telenomus coilus* Walker, 1836**

**DOWN:** Holywood (J4079), AHH (Walker, 1836).

The host is unknown and the species, apparently, only recorded from Ireland. O’Connor and Ashe (2011) showed that *T. coilus sensu* Kozlov & Kononova, 1983 was a previously unrecognized species *Telenomus (Aholcus) kononovae* O’Connor and Ashe. It occurs in Russia and the Ukraine.

***Telenomus dalmanni* (Ratzeburg, 1844)**

**WEXFORD:** Stoneyford near Broadway (T1009), Malaise trap in an overgrown area set aside for wildlife, 2♀♀ 12-21 August 1993, JPOC (Buhl and O'Connor, 2011).

*Telenomus dalmanni* has been reported from the eggs of the vapourer moth *Orgyia antiqua* (L.) (Lepidoptera: Lymantriidae) (Kononova and Kozlov, 2001). The species is also known from Austria, Denmark, Great Britain, south Russia and the Netherlands (Johnson, 2013a).

***Telenomus eris* Walker, 1836**

**DOWN:** Holywood (J4079), AHH (Walker, 1836).

The host is unknown. Johnson (2013a) reports the species from Britain and Moldova.

***Telenomus fergussoni* Buhl and O'Connor, 2012**

**WEXFORD:** Curracloe (T1128), ♀ 22 August 2011, swept with a net from the sand-dune vegetation near Ballinesker beach, JPOC (Buhl and O'Connor, 2012).

The host and non-Irish distribution are unknown.

***Telenomus heliodorus* Mineo, 2006**

**MEATH:** Thomastown Bog (O0068), Malaise traps, ♂ 25 May-4 June and 2♂♂ 19 June-7 August 1997, C. Ronayne (O'Connor, in press, a).

The host is unknown. Outside Ireland, the species is only known from the type locality in the north of Sicily, Italy (Mineo, 2006).

***Telenomus heteropterus* Haliday, 1833**

**DOWN:** Holywood (J4079), AHH (Walker, 1836).

The host is unknown. Johnson (2013a) also reports the species from Denmark.

***Telenomus heydeni* Mayr, 1879**

**DUBLIN:** Malahide Castle (O2245), swept from vegetation along a pathway in woodland, ♀ 6 October 1985, JPOC and MAOC (O'Connor and Mineo, 2006). **WEXFORD:** Stoneyford near Broadway (T1009), swept from vegetation beside a small stream, 2♀♀ 10 August 2009, JPOC (O'Connor and Mineo, 2013).

*Telenomus heydeni* parasitizes the eggs of several species of shield-bug (Hemiptera:

Heteroptera) including *Palomena prasina* and is widely distributed in the Palaearctic region (O'Connor and Mineo, 2006). It also occurs in Morocco in North Africa (Pintureau, Bourarach and Rohi, 2003).

***Telenomus kolbei* Mayr, 1979**

**DUBLIN:** Castleknock (O0837), Malaise trap in a suburban garden, ♀ 8 August-8 September 1984, JPOC (Buhl and O'Connor, 2011).

*Telenomus kolbei* has been reported from the eggs of the Tea Tussock Moth, *Euproctis pseudoconspersa* (Strand) (Lepidoptera: Lymantriidae), in Japan (Ashiba, 1959). The species is probably a parasitoid of a related moth species in Ireland. There are records from Austria, Denmark, Greenland, Sweden and the Ukraine (Buhl, 1995).

***Telenomus laeviusculus* (Ratzeburg, 1844)**

**DUBLIN:** Castleknock (O0837), Malaise trap in a suburban garden, ♀ 26 April-26 May 1985, JPOC (O'Connor and Mineo, 2013).

*Telenomus laeviusculus* is a known parasitoid of the eggs of the Gypsy Moth *Lymantria dispar* (L.), the Lackey Moth *Malacosoma neustria* (L.) and the Pine-lappet Moth *Dendrolimus pini* L. (Lepidoptera) (Kononova and Kozlov, 2001). Mineo (2003) and Johnson (2013a) report the species from Germany, Italy and south Russia while Özbek and Çoruh (2010) have also recorded it from Turkey.

***Telenomus longulus* Kozlov, 1967**

**WEXFORD:** Craywell, New Ross (S7228), swept from an overgrown area in a small public park on a steep hill, ♀ 3 August 2008, JPOC (O'Connor and Mineo, 2009b).

The host is unknown. *Telenomus longulus* is also known from Finland and Russia (O'Connor and Mineo, 2009b).

***Telenomus lopicida* Silvestri, 1932**

**WEXFORD:** Bannow Bay (S7807), swept from seashore vegetation, ♀ 4 August 2007, JPOC (O'Connor and Mineo, 2013).

The life-history and immature stages were described by Mineo and Sinacori (1978).

*Telenomus lopicida* develops in Miridae (Hemiptera: Heteroptera) and has been reported from the eggs of species in the genera *Lopus* and *Calocoris* (Mineo, 2004). It has been recorded from several areas of Italy including Sicily (Mineo, 2003).

***Telenomus nitidulus* (Thomson, 1844)**

**CORK:** The Tunnel near Glengarriff (V9059), mountain moorland, ♀ 10 July 1985, JPOC and MAOC (O'Connor and Mineo, 2007). **WEXFORD:** Ballyteige (S95040), swept from vegetation on the sand-dunes, ♀ 7 August 2007, JPOC (O'Connor and Mineo, 2013); Craywell, New Ross (S72280), ♀ 3 August 2008, JPOC (O'Connor and Mineo, 2009a); Curracloe (T1127), swept from vegetation on the sand-dunes, ♀ 27 August 2009, JPOC; New Ross (S7228), swept from vegetation in a suburban garden, ♂ 2 August 2007, JPOC; Oaklands Wood (S7125), swept from mixed vegetation beside a path through the woods, ♀ 29 July 2008, JPOC (O'Connor and Mineo, 2013).

The hosts are various species of moth (Lepidoptera) (O'Connor and Mineo, 2007). Johnson (2013a) records *Telenomus nitidulus* from Austria, Denmark including the Faroe Islands, France, Germany, Iceland, Russia and Sweden while Fergusson (1978) reports it from Britain.

***Telenomus othonia* Walker, 1836**

**KILKENNY:** Woodstock Estate, Inistioge (S6336), swept from vegetation in mixed woodland, ♀ 2 August 2008, JPOC (Mineo, O'Connor and Ashe, 2011).

The host is unknown. The species has been collected in England and Madeira (Walker, 1836; Graham, 1984).

***Telenomus othus* Haliday, 1833**

**CORK:** Glengarriff Woods (V9057), swept from vegetation in oak *Quercus* woodland, ♀ 6 July 1985, JPOC and MAOC (O'Connor and Mineo, 2006). **DOWN:** Holywood (J4079), AHH (Walker, 1836).

*Telenomus othus* has been reared from the eggs of the mirid bug *Caspsus ater* L. (Hemiptera: Miridae). There are records from Denmark, Sweden and the Netherlands (O'Connor and Mineo, 2006). Johnson (2013a) adds Denmark and the Faroe Islands.



***Telenomus phyllias* Walker, 1836**

**DOWN:** Holywood (J4079), AHH (Walker, 1836); **WEXFORD:** Craywell, New Ross (S7228), swept from an overgrown area in a small public park on a steep hill, ♀ 9-10 August 2010, JPOC (det. GM); Curraclloe (T1127), swept from vegetation on the sand-dunes, ♂2♀♀ 14-15 August 2010, JPOC (det. GM).

The Wexford records are the first Irish ones for over 170 years. The host is unknown and the species, apparently, only recorded from Ireland.

***Telenomus stilpo* Walker, 1836**

**DOWN:** Holywood (J4079), AHH (Walker, 1836).

The host seems to be unknown. Johnson (2013a) reports the species from Austria, Britain, Denmark and Germany.

***Telenomus turesis* Walker, 1836**

Synonym *Telenomus chloropus* (Thomson, 1861)

**CORK:** Garnish Island (V9356), swept from mixed vegetation, ♂ 1 July 1985, JPOC and MAOC (O'Connor and Mineo, 2009a).

*Telenomus chloropus* was synonymised with *T. turesis* by Mineo, O'Connor and Ashe (2011). The species is a parasitoid of the eggs of many species of shield-bugs (Hemiptera) including *Palomena prasina* and is widely distributed in Europe. It also occurs in Iran, Japan, Kazakhstan, North Africa, the Far East, the Ukraine and Turkey. The species has been introduced into North America and the Philippines as a biological control agent (O'Connor and Mineo, 2009a; Samin *et al.*, 2010).

***Telenomus vibius* Walker, 1838**

**New to Ireland**

**WEXFORD:** Craywell, New Ross (S7228), swept from an overgrown area in a small public park on a steep hill, ♂3♀♀ 9-10 August 2010, ♀ 14-15 August 2010, JPOC (det. GM).

The host is unknown. Recorded by Walker (1838) from near London. *Telenomus vibius* was redescribed by Fergusson (1983).

***Trissolcus flavipes* (Thomson, 1860)**

**WATERFORD:** Belle Lake (S6605), swept from lakeside vegetation, ♀ 11 June 1991, JPOC (O'Connor and Mineo, 2007); **WEXFORD:** Oaklands Wood (S7125), swept from mixed vegetation beside a path through the woods, ♀ 29 July 2008, JPOC (det. GM).

The hosts are shield-bugs (Hemiptera) including the green shieldbug *Palomena prasina* L. (Hemiptera: Pentatomidae) (Konova and Kozlov, 2001). Mineo (2003) and Johnson (2013a) report it from Denmark, Italy, Moldova, Russia and the Ukraine.

***Trissolcus grandis* (Thomson, 1860)**

**SLIGO:** near Rathcormack (G6941), swept from vegetation beside the Drumcliff River, ♀ 28 August 1992, JPOC (Buhl and O'Connor, 2011).

*Trissolcus grandis* has been reported from the eggs of 18 species of shield-bugs (Hemiptera: Heteroptera) (Kononova and Kozlov, 2001). It has also been recorded from Belgium, Denmark, Italy, Romania, south Russia, Sweden, North Africa including Morocco, Middle East including Iran and Central Asia (Pintureau, Bourarach and Rohi, 2003; Ghahari, Buhl and Kocak, 2011; Johnson, 2013a).

***Verrucosicephalia depressa* Szabó, 1975**

**MEATH:** Thomastown Bog (O0068), Malaise trap, 9 ♀♀ August 1997, C. Ronayne.

Murphy *et al.* (2006) has shown *Telenomus* to be a polyphyletic group. As a result, based on morphological characters, Mineo, O'Connor and Ashe (2011) re-instated *Verrucosicephalia* Szabó to include three species *viz.* *V. depressa*, *V. laricis* and *V. rachelae* (Mineo, 2004). The host is unknown. *V. depressa* was described from Hungary by Szabó (1975).

***Verrucosicephalia laricis* (Walker, 1836)**

Original combination *Telenomus laricis* Walker, 1836

**DOWN:** Holywood (J4079), AHH (Walker, 1836); **DUBLIN:** Castleknock (O0837), Malaise trap in a suburban garden, ♂ 8 August-8 September 1984, JPOC (Mineo, O'Connor and Ashe, 2011); **MEATH:** Thomastown Bog (O0068), Malaise trap, 17♂♂12♀♀ 26 July - 6 August 1997, August 1997, C. Ronayne (Mineo, O'Connor and Ashe, 2011); **WEXFORD:** Craywell,

New Ross (S7228), swept from an overgrown area in a small public park on a steep hill, 3 ♀♀ 3 August 2008, JPOC (O'Connor and Mineo, 2009b).

The Agromyzidae (Diptera) can be considered as one of the hosts of *Verrucosicephalia laricis* or at least of its sister species. It is also known from Austria, Denmark, Great Britain, Hungary, Russia and Sweden (O'Connor and Mineo, 2009b).

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This work on Irish scelionids could not have been carried out without the wonderful help that JPOC has received since starting work on the group. The authors would like to thank Paddy Ashe, Mike Boston, Peter Buhl, Colm Ronayne, Professor Giovanni Mineo and Mary O'Connor for their invaluable assistance. The online site *The genera of Platygastroidea (Hymenoptera) of the World* has been a vital resource and we are very grateful to Professor Norman Johnson and his staff for their hard work and foresight in providing such an essential facility.

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**TABLE 1.** Distribution of Irish species in Great Britain and outside the British Isles.

<b>Irish species</b>	<b>Great Britain</b>	<b>Distributional comments</b>
<i>Anteris asramanes</i>	Recorded	Several European countries
<i>Baeus seminulum</i>	Recorded	Several European countries, Greenland
<i>Gyron misellum</i>	Recorded	Europe, Azerbaijan, Turkey, North America, Australia
<i>Scelio vulgaris</i>	Not recorded	Several European countries, Azerbaijan, Georgia and Turkey
<i>Thoron metallicus</i>	Recorded	Widely distributed in Europe, Azerbaijan, Moldova, North America and Turkey
<i>Tiphodytes gerriphagus</i>	Recorded	Holarctic
<i>Teleas clavicornis</i>	Recorded	Several European countries
<i>Teleas pulex</i>	Not recorded	Not recorded
<i>Trimorus aegle</i>	Recorded	Not recorded
<i>Trimorus apricans</i>	Not recorded	Not recorded
<i>Trimorus aratus</i>	Recorded	Not recorded
<i>Trimorus bacilliger</i>	Recorded	Not recorded
<i>Trimorus elatior</i>	Recorded	France
<i>Trimorus elongatus</i>	Recorded	Several European countries
<i>Trimorus ephippium</i>	Recorded	Several European countries
<i>Trimorus flavipes</i>	Recorded	Several European countries
<i>Trimorus lamus</i>	Not recorded	Not recorded
<i>Trimorus opacus</i>	Recorded	Several European countries

TABLE 1 (Continued)

Irish species	Great Britain	Distributional comments
<i>Trimorus paula</i>	Recorded	Not recorded
<i>Trimorus procris</i>	Recorded	Not recorded
<i>Trimorus rufonotatus</i>	Recorded	Several European countries
<i>Trimorus sectigena</i>	Not recorded	Italy
<i>Trimorus therycides</i>	Recorded	Several European countries
<i>Trimorus timareta</i>	Recorded	France
<i>Trimorus tuberculatus</i>	Not recorded	Italy
<i>Trimorus varicornis</i>	Recorded	Several European countries
<i>Xenomerus ergenna</i>	Recorded	Europe, India, Japan, South Korea
<i>Xenomerus canariensis</i>	Recorded	Europe, Kenya, Nepal, South Africa and Zimbabwe
<i>Telenomus andria</i>	Recorded	Not recorded
<i>Telenomus brachialis</i>	Recorded	Not recorded
<i>Telenomus coilus</i>	Not recorded	Not recorded
<i>Telenomus dalmanni</i>	Recorded	Several European countries
<i>Telenomus eris</i>	Recorded	Moldova
<i>Telenomus fergussoni</i>	Not recorded	Not recorded
<i>Telenomus heliodorus</i>	Not recorded	Italy
<i>Telenomus heteropterus</i>	Not recorded	Denmark
<i>Telenomus heydeni</i>	Not recorded	Several European countries, Morocco
<i>Telenomus kolbei</i>	Not recorded	Several European countries, Japan
<i>Telenomus laeviusculus</i>	Not recorded	Germany, Russia, Turkey

TABLE 1 (Continued)

<b>Irish species</b>	<b>Great Britain</b>	<b>Distributional comments</b>
<i>Telenomus longulus</i>	Not recorded	Finland, Russia
<i>Telenomus lopicida</i>	Not recorded	Italy
<i>Telenomus nitidulus</i>	Recorded	Several European countries
<i>Telenomus othonia</i>	Recorded	Madeira
<i>Telenomus othus</i>	Not recorded	Several European countries
<i>Telenomus phylis</i>	Not recorded	Not recorded
<i>Telenomus stilpo</i>	Recorded	Several European countries
<i>Telenomus turesis</i>	Recorded	Europe, Iran, Japan, Kazakhstan, North Africa, the Far East, and Turkey
<i>Telenomus vibius</i>	Recorded	Not recorded
<i>Trissolcus flavipes</i>	Not recorded	Several European countries
<i>Trissolcus grandis</i>	Not recorded	Several European countries, North Africa including Morocco, Middle East including Iran and Central Asia
<i>Verrucosicephalia depressa</i>	Not recorded	Hungary
<i>Verrucosicephalia laricis</i>	Recorded	Several European countries

**FIGURE 1.** The counties of Ireland.



**FIRST IRISH RECORDS OF *THERIDION HEMEROBIUS* SIMON, 1914 (ARANEAE: THERIDIIDAE)**

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**Abstract**

Specimens of the spider *Theridion hemerobius* Simon, 1914 (Araneae: Theridiidae) were found at three widely separated locations on Irish waterways. The spider is possibly a quite recent arrival and may have been introduced through human agency.

**Key words:** Araneae, Theridiidae, *Theridion hemerobius*, Ireland, first records

**Records and identification of *Theridion hemerobius* Simon, 1914**

**TIPPERARY:** Lough Derg, Terryglass (M863009), from the ceiling of a plastic lifebelt housing and from a low, roofed information panel on the margins of the lake, ♂3♀♀ of *Theridion hemerobius* on 5 June 2013. Also *Theridion varians* Hahn, 1833 (♀).

**WESTMEATH:** Lough Owel (N417587), from the ceiling of a plastic lifebelt housing, a ♀ of *T. hemerobius* on 29 June 2013. Also, from under a concrete overhang on a building a ♀ of *T. mystaceum*, L. Koch, 1870. **LEITRIM:** Lough Allen, Drumshanbo (G967110), from the underside of a metal spar supporting an information sign, 2♀♀ of *T. hemerobius* on 30 June 2013. Also, from a toilet and shower block, *T. varians* Hahn, 1833 (♂2♀♀), *T. mystaceum* (♀), *B. gracilis* (Blackwall, 1841) (♀) and many immatures of *Zygiella* and *Larinioides*.

The specimens of were identified as *T. hemerobius* using Bosmans *et al.* (1994), Almquist (2005) and Knoflach *et al.* (2009). The spider is closely related to *Theridion pictum* (Walckenaer, 1802), which has not been recorded in Ireland and with which *T. hemerobius* has been confused. *T. hemerobius* is not noted in Helsdingen (1996) nor any subsequent publication

on Irish spiders and the present records are considered the first for Ireland.

The spider is quite variable in colouration and markings. The carapace in both sexes is pale with a dark median band similar to *T. varians* but neither so wide nor so dark as this species. The Irish male specimen resembles *T. varians* having a foliate median band on the abdomen and one of the females is similarly marked. The other two females have a large dark patch centrally and slightly anteriorly on the dorsum but the mark is significantly darker in one specimen (teneral) than the other. Two of the females have clearly annulated legs while the teneral specimen's legs are generally very pale with a hint of annulations on legs I-III and slightly darker on leg IV. The variability of markings in adults makes the safe assignation of juvenile specimens difficult (Law, 2005). This author also observed possible evidence of melanism in some specimens located on a dark (rusting) surface.

### **Nomenclature and taxonomy**

The correct form of the name is *Theridion hemerobius* despite the frequent appearance of the spelling *hemerobium*. Cameron (cited in Platnick, 2013) states that the specific name is a Greek two-ending adjective (thus the -us ending is both masculine and feminine). He corrects the statement that the specific epithet is a latinised noun in apposition as suggested by Bosmans *et al.* (1994).

The present picture of the distribution of *T. hemerobius* has emerged relatively recently due in part to the previous lack of readily available good diagnostic illustrations (Bosmans *et al.*, 1994) or of errors in description: Simon's (1914) illustration of the male is not of *T. hemerobius* (Bosmans *et al.*, 1994) and he did not illustrate the female; Levy and Amitai (1982) illustrated *T. hemerobius* under the name *T. ?pictum* but noting the resemblance of the females to other European and American species, and not having seen any males, did not commit to a diagnosis of the latter sex; numerous of the descriptions appearing in the U.S.A. described the species under a different name (Platnick, 2013). A paper by Blick *et al.* (1993) finally illustrated both sexes together as *T. hemerobius* and Bosmans *et al.* (1994) made an accurate description

available in a more widely available journal. In Britain, for example, this probably facilitated the subsequent appearance of information on the species' distribution and habits there (Daws, 2003, 2004; Law 2004, 2005; Marriott, 1998; White, 2005).

### **Species distribution**

Canada, U.S.A., Europe, Russia, Israel and Turkey (Helsdingen, 2013; Platnick, 2013): it is found across a broad tract of the European continent, occurring from Ireland (present records) to southern Russia and from the Mediterranean to Scandinavia, however it is yet to be recorded from a large area of the Balkans, Eastern Europe and the Baltic. There are still very few records from numerous countries where it has been recorded. It is known from the following European countries and territories: Great Britain, France (and Corsica), Belgium, Netherlands, Denmark, Sweden, Germany, Switzerland, Slovakia, Czech Republic, Portugal, Italy (and Sardinia (doubtful according to <[www.araneae.unibe.ch](http://www.araneae.unibe.ch)>)), Greece, Romania and Bulgaria, (Helsdingen, 2013).

The suggestion of Bosmans *et al.* (1994) that the species, being widespread, may be identified from collections previously made has been borne out to some extent by the first identification of the species' occurrence in Greece from a collection made there in 2000 (Knoflach *et al.*, 2009) and in Turkey from specimens deposited in 2010 (Danışman *et al.*, 2011). The species may be spreading; a number of first records for a country are recent, *inter alia* the Czech Republic, 1996/1997 (Holec, 2000), Turkey, 2010 (Danışman *et al.*, 2011), Greece, 2000 (Knoflach *et al.*, 2009).

### **Preferred environment**

The spider has a clear association with natural, eutrophic wetland habitats and with anthropogenic structures in such situations and on managed waterways. Thus in the Czech Republic, the species was first recorded from eulittoral vegetation (*Carex*, *Typha* and *Phragmitis*) and was at the time interpreted as being restricted to this habitat (Holec, 2000).

However, Buchar and Ruziska (2002) note that it can be easily collected in the country from artificial structures.

### **Natural habitat**

Usually found on littoral and emergent vegetation at the margins of various freshwater habitats: rivers, lakes, marshes etc (Anthes, 2000; Almquist, 2005). Bosmans *et al.* (1994) characterise its preferred habitat as ancient, eutrophic marsh e.g. reed marshes and flooded nitrophilous vegetation, often dominated by *Urtica*. Anthes (2000) and Knoflach *et al.* (2009) suggest that the spider is stenotopic to such (riparian) habitats. In the Netherlands, it is found in littoral sedge tussocks on peat-bog fenland (Helsdingen, 2005) and has also been found in bog in France and Germany (Blick *et al.*, 1993; Peru, 2006).

It is known from a variety of other habitats; in France from salt-marsh, oak *Quercus* and pine *Pinus* forest (Peru, 2006) and on lowland heath on sandy soil close to birch *Betula* (Braud, 2007), papyrus reed *Cyperus* (Israel), shrub in steppe (Slovakia) (Bosmans *et al.*, 1994), gravel banks (Anthes, 2000).

The preferred plant species seem to be *Typha*, *Carex*, *Phragmites* and *Urtica* (Bosmans *et al.*, 1994; Helsdingen, 2005; Holec, 2000; Almquist, 2005). It has also been collected from stones amongst *Phragmites* vegetation and from a variety of shrubs and bushes (Anthes, 2000).

### **Semi-natural and managed habitats**

The species is found on vegetation and man-made structures bordering managed water bodies e.g. canals, flooded gravel pits etc. Isolated artificial pools that host the spider seem usually to be adjacent to canals or rivers from which the spider possibly colonised (Marriott, 1998; Law, 2004). Harvey *et al.* (2002) discuss the spider's occurrence in littoral vegetation but subsequent researches (especially in England) (Daws, 2003, 2004; Law, 2005; White, 2005) has shown the spider to be readily collectable from non-natural structures on which it sets its web: signage, fishing platforms, metal railings, bridges, horizontal galvanised bumper bars (canal edges) and



pilings. In Britain, the species is now known to be widely distributed through central England's canal system (Law, 2005). Daws (2004) suggests the species is largely absent from reservoirs, isolated lakes and non-navigable rivers. Specimens were first recorded in Turkey from two gardens (Danışman *et al.*, 2011). Law (2005) found hand searching of solid structures to be a far more efficient way of detecting the species rapidly compared to beating vegetation. Daws (2003, 2004) found that it did occur on metal, wood and plastic structures but avoided stone and brick. This might gain evidence from the Irish occurrences where at Drumshanbo, no specimens of *T. hemerobius* were collected from a brick toilet unit while both *T. varians* and *T. mystaceum* were present. Daws (2003) suggests that this behaviour may be to avoid competition with other *Theridion* species. Aggressive interactions do occur between the species for one of the Irish females identified had been bitten and was being wrapped by a mated (epigyne plugged) female of *T. varians*.

### **Micro-habitat**

*T. hemerobius* prefers to be slightly shaded or sheltered and usually can be found concealed under an overhang (Daws, 2003). Law (2005) agrees, having found most specimens under the overhang of horizontal bumpers edging canals. This accords very well with the situations in which the Irish specimens were found. The spider can also be found within a small, silk, tubular retreat under such overhangs. It has been recorded from unvegetated sand and gravel banks where it presumably lives interstitially and occurs up to 1.5m on preferred vegetation (Anthes, 2000).

### **Comments**

Law (2005) queries how this species has remained undetected for so long in Britain. It is difficult to know if it has an ancient association with natural situations in countries such as Ireland and Britain or has spread into them having been introduced into managed waterway systems. Three possibilities may be suggested: (1) It was recently introduced and is spreading

along waterways making use of both natural and man-made environments. (2) It has long been native and has been misidentified or overlooked by collectors. (3) It had been confined to natural habitats but has recently started to make use of artificial structures, leading to a recent rapid dispersal and consequently a greater number of sightings. The second suggestion is irrelevant to Ireland since *T. pictum*, the only species with which it could be reasonably confused, has not been recorded here.

Daws (2004) notes the seeming absence of the species from heavily built-up areas. Law (2005) also did not detect it in some urban areas. A couple of urban areas I searched did not produce any specimens (details below). The spider's preference for artificial structures does not in any way obviate the possibility that it may make use of natural habitat at some stage of its life-cycle.

Given that it can make use of artificial structures, plastic, metal and otherwise, it seems very likely that it could be dispersed by the movement of boats through waterways.

The following areas were also searched but *T. hemerobius* was not found: **DUBLIN:** Grand Canal in Dublin, from Portobello bridge (O156324) to Mount Street bridge (O172333) on 9 June 2013. Same area on tree trunks, 14 June 2013, *T. mystaceum* (♀) with egg-sac, *T. tinctum* (Walckenaer, 1802) (♀) with egg-sac. There are few records of the latter species in Ireland and it has a rather local distribution. **WESTMEATH:** McNead's Bridge, Royal Canal (N493528), galvanised bumper railing on pathside adjacent to canal, 29 June 2013, *T. varians* (♀) epigyne plugged and with egg-sac; same location, metal signage, metal gates, galvanised bumper railings, 12 July 2013, *T. varians* (6♀♀, all plugged and with at least 1 egg-sac each). Numerous *Zygiella* and *Larinioides* immatures also seen. **LEITRIM:** Carrick-on-Shannon (M937993), signage, a metal walkway set in the River Shannon (with lifebelts and housings) and other artificial structures, 29 June 2013, no likely Theridiidae seen, numerous immatures of *Zygiella* sp. and *Larinioides* sp. were noted. **KILKENNY:** lifebelt housings along a riverside path within the city precincts, (S5155), 6 July 2013, *T. varians* (3♀♀). At least 5 or 6 other specimens, all most likely *T. varians* (based on the very rapid manner in which they jumped

from their webs and eluded capture).

These records of absence do not mean the spider is not in these areas. Law (2005) noted the species could occur in a locality despite not being found on long stretches of likely habitat therein.

### **Habits and seasonality**

Anthus (2000) summarises the available information and reports males and females appearing as early as February. Males are mature from then to July, reaching a maximum from the middle of May to early July. Females mature slightly later than males and reach maximum abundance from the end of May to the end of July but persist into August. Only females are found into September. Daws (2004) found subadults and a range of immature instars in October and the following March mature females were found at the same site alongside large immatures and sub-adults. The species thus probably has an essentially annual cycle though it is possible that a spiderling hatching late in the year might be obliged to overwinter twice before maturing. Daws (2004) suggests the spider may have a long breeding season, potentially March to September, with reproduction being deterred only by the onset of winter.

Daws (2004) recorded a specimen at a significant distance from any water body and feels it might indicate the species can disperse by ballooning. This being the case the spider might have made it to Ireland under its own silk, however the case demonstrating ballooning on the part of the species has not been definitely established.

### **Irish Distribution**

The species is obviously widespread in Ireland and could very well be widely (if not commonly) dispersed through the major waterway systems of the Shannon River and the Royal and Grand Canals. Lough Derg and Lough Allen are respectively the southern and northernmost major lakes on the Shannon. The presence of the spider at both suggests it could occur in likely habitat along the Shannon's full course of 360km. The Lough Allen site is at the lake's

southernmost tip at a point where the lake leads into a canal which in turn leads into the Shannon after some 7km. Lough Owel, through a narrow channel, supplies the Royal Canal at Mullingar, which then runs west where it eventually joins the Shannon at Cloondara. The River Brosna also flows through Mullingar and is joined by the Grand Canal very shortly before the river meets the Shannon. Thus the spider certainly has access to both the canal systems that between them run a course some 270km in length from the Shannon to Dublin. While the distances between the locations where the spider was found are relatively large, over 50km from Drumshanbo to Lough Owel and about 120km from Drumshanbo to Terryglass (as the crow flies), the waterways provide a ready route for dispersal, regardless of whether this is by virtue of natural habitat or the economic and leisure activities of humans.

It is worth noting that *Larinioides sclopetarius* (Clerck, 1757) has a somewhat similar distribution in Ireland where it preferably inhabits solid, man-made structures along waterways. Typically it can be found on bridges, walls and signage along rivers and canals and occasionally on very sturdy vegetation if immediately adjacent. It is possible this species is also a relatively recent advent to Ireland; it was first noted here less than thirty years ago (Taylor, 1986) but there are now a significant number of records and it is widely distributed (Cawley, 2009). It is hard to believe that this large spider, often abundant in heavily built-up areas, would have been missed by arachnologists collecting in Ireland in the early twentieth century.

### **Conservation status**

*T. hemerobius* has been considered threatened. In Germany, it has been thought endangered (Platen, 1997 (cited by Anthes (2000))), on basis of its occurrence in threatened wetlands. While it was once considered rare in Britain, it is now obviously known to be far more widespread than recently thought; nevertheless Harvey *et al.* (2002) suggest management protocols for those wetland habitats in which it occurs.

In Ireland, while it will be of great interest to see if it occurs in natural or threatened habitats, it is more probably an introduced alien, possibly recently arrived, which has established a

resident community throughout Ireland's waterways. That the species has not been noticed till now is curious and similar to the situation that pertains in Britain. The question as to whether it is long-established here could possibly be resolved through examination of DNA and comparison with other European populations.

### **Acknowledgements**

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## **A REVISED CHECKLIST OF THE BITING MIDGES (DIPTERA: CERATOPOGONIDAE) OF IRELAND: CORRECTION**

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### **Abstract**

While compiling additions and corrections to a revised checklist of the biting midges (Diptera: Ceratopogonidae) of Ireland, it was noted that several lines of text was missing in that work. This error is corrected.

**Key words:** Diptera, Ceratopogonidae, biting midges, Ireland, checklist, correction

### **Introduction**

Ashe, O'Connor and Chandler (2013) have published additions and corrections to the Irish checklist of Ceratopogonidae. While compiling this work, the following error was found in Ashe, O'Connor and Chandler (2012).

### ***Forcipomyia (Forcipomyia) brevipennis (Macquart, 1826)***

In Ashe *et al.* (2012) this species was correctly listed as Irish, However, the Co. Waterford record reproduced below was accidentally listed under the species *F. (F.) bipunctata* (Linnaeus, 1767) due to the heading and several lines of text for *F. (F.) brevipennis* being missing above this record at the top of page 222 of Ashe *et al.* (*op.cit.*). The missing text for Co. Waterford is as follows:- “A male and a probable female of this species, which breeds in cow and horse dung, were first recorded from Ireland in Chandler and O'Connor (2010). The species is likely to be widespread in Ireland.



A second Irish record, from Co. Wexford, is detailed below.”

**WATERFORD:** 9 August 2006, from vegetation on marine cliffs, Dunmore East (X6999) [PT.3], JPOC (Chandler and O’Connor, 2010).

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## **THE CADDISFLIES (TRICHOPTERA) OF CO. KERRY, IRELAND. PART 1: RECORDS OF SPECIES TAKEN AT LIGHT**

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### **Abstract**

Records are presented of Irish caddisflies (Trichoptera) taken at light in Co. Kerry, Ireland. Altogether, distributional data are given for 81 species.

**Key words:** Trichoptera, caddisflies, Ireland, Kerry, distribution, records, at light

### **Introduction**

County Kerry is situated in the south-west of Ireland and the tip of it (Dingle Peninsula) is the most westerly part of the island (Fig. 1). The county is bounded on the west by the Atlantic Ocean and on the north by the River Shannon. Kerry is one of the most mountainous regions of Ireland and contains two of its three highest mountains. Because of the mountainous area and the prevailing south-westerly winds, Kerry is among the regions with the highest rainfall on the island. As a result, there are numerous streams, rivers, lakes and other water-bodies in the area.

The author is currently preparing a major account of the Irish caddisflies based on collections made over a forty year period. As part of that work, information has been compiled on the trichopterous faunas of the various Irish counties. Since intensive work was carried out on Co. Kerry from the early eighteen sixties, it was considered useful to provide detailed distributional information on the collections made there in recent years. Part 1 deals with specimens collected at light and lists records for 81 species. Part 2 will provide data on material collected more extensively by other means.

King (1887-1888) made the first systematic collections in Kerry based mainly in the Killarney area. Later, King and Halbert (1910) provided a comprehensive account of the then known fauna. Since these publications, additional species have been added to the Irish list from Co. Kerry. These include *Beraeodes minutus* (L.), *Hydroptila pulchricornis* Pictet, *Hydroptila tigurina* Ris, *Hydroptila valesiaca* Schmid, *Ithytrichia clavata* Morton, *Lasiocephala basalis* (Kolenati), *Limnephilus elegans* Curtis, *Lype reducta* (Hagen), *Mesophylax impunctatus* McLachlan and *Orthotrichia angustella* (McLachlan) (O'Connor, 1978a, 1978b, 1982, O'Connor and O'Connor, 2013). Although, most have now been found elsewhere in Ireland, their discovery demonstrates the potential of the county for new surprises. Kerry is also notable for the presence of *Apatania auricula* (Forsslund) and *Setodes argentipunctellus* McLachlan (O'Connor, 1978a, 1987). The records for *A. auricula* will be published separately.

O'Connor and Wise (1984, 2004) provided accounts of the Trichoptera of the Killarney Lakes, and the Rivers Flesk and Laune also in Killarney. However, it was not possible to provide comprehensive data on the adult catches due to space limitations. In addition, captures at Doolough in the Killarney lakes complex were not included. The present paper provides detailed information on the light-trap catches including those outside the Killarney area (Fig. 1). Specimens were taken in Heath portable light-traps operated in 1972, 1973, 1974, 1979 and 1987. All the specimens were collected and identified by the author. It is important to note that the traps were often affected by high winds and heavy rainfall, sometimes blowing over. As a result, some catches were diminished. The nomenclature follows O'Connor and Nelson (2012) with some changes following Barnard and Ross (2012).

The sites in the Killarney area are grouped together under each species in section **(a)**. Those outside the Killarney are included in **(b)**. National grid references are given for each site. Unless otherwise stated, species may be considered to be widespread in Ireland (O'Connor, 1987).

### **Abbreviations**

The following abbreviations have been used in the text: conf. = determination confirmed by; Cos = Counties; L. = Lough; NMI = National Museum of Ireland; R. = River; uv = ultra violet.

(NMI) indicates that representative specimens from a particular catch have been deposited in the National Museum of Ireland.

### **Descriptions of the sites**

*The Killarney area* (Fig. 2)

**Doolough (Doo Lough) (V9585):** Muckross Peninsula: a small lake situated between L. Leane and Muckross Lake. Situated in woodland, the lake is very inaccessible with *Phragmites* reed-beds. The traps were run in a nearby field.

**Lough Leane (V9686):** Castlough Bay, the traps were sited overlooking the exposed Castlough Bay which has a substrate of sand with a narrow stony margin.

**Lough Leane (V9488):** Ross Island, the traps here overlooked Ross Bay.

**Muckross Lake (V9485):** Brickeen Bridge, the traps were positioned at a moderately exposed headland. The littoral substrate consisted of large angular rock fragments but there was also a sheltered inlet with a growth of *Phragmites*. The stony substrate was overlain by silt and organic litter.

**Muckross Lake (V9485):** Colleen Baun (Bawn) Rock, the traps were placed beside an exposed shore comprising a flat area interspersed by large stones and a narrow marginal belt of wave-washed stones.

**Muckross Lake (V9685):** Dundag Bay, the traps overlooked a comparatively large bay which was partially sheltered. The substrate was predominantly sand but *Phragmites*, *Littorella* and stones were present. At the time of sampling, the area was receiving discharges of sewage from Muckross House.

**Muckross Lake (V9685):** Goleen Bay, the traps were near an exposed sandy shore with some stones.

**Upper Lake (V9383):** Long Range, the lake was very inaccessible for deploying traps so they were operated overlooking the rocky and exposed Long Range.

**River Flesk (V9789):** circa 1km upstream of Flesk Bridge. The traps were adjacent to an area where the river was fast flowing with a shallow “riffle” zone . There was a predominantly stony substrate with beds of *Ranunculus*. *Fontinalis* was also present.

*Outside the Killarney area* (Fig. 3)

**Curraheen River (Q7811):** the traps were placed where the river was torrential and about 4m wide. Stones, rocks and boulders predominated. There was also gravel, mosses and several small waterfalls. A flying adult of *Philopotamus montanus* (Donovan) was observed but no specimens entered the traps.

**Lough Currane (V5065):** the traps were set beside the lake where there was an exposed rocky shore-line.

**Lough Derriana (V6274):** the trap was erected beside a fast flowing mountain stream entering the lake.

**Lough Gill (Q6113):** the traps were placed in a break in the reeds beside this large shallow lake beside the sea. L. Gill had been drained recently but there were a few deep holes still present. Reeds and rushes surrounded the water-body. The substratum consisted of sand with a few stones. Because the lake was less than 1m in depth, cattle were observed crossing it at dusk.

**River Behy (V6589):** the traps were sited beside the river near Glanbehy Bridge where there was a very steep waterfall. Boulders predominated but gravel and rocks were present. The weather was wet and windy in August and the trap was blown over several times. Adults of *P. montanus* were present but none were trapped.

**River Galey (R0139):** a wide drained river, mainly gravel and stones with a few rocks. There was very heavy rain while the traps were in operation.

**River Inny (V5572):** the traps were positioned below Foildrenagh Bridge. The river bed consisted of solid rock cut into jagged sheets with some gravel and sand. Further upstream, the substratum was composed mainly of gravel.

## Results

### RHYACOPHILIDAE

#### *Rhyacophila dorsalis* (Curtis, 1834)

(a). Killarney: Doolough, ♀ 2-3 July 1973. L. Leane, Castlough Bay, ♂ 26-27 June 1973, ♀ 29-30 July 1973. Muckross Lake, Colleen Baun Rock, ♀ 27-28 July 1973; Goleen Bay, ♀ 16-17 July 1973, ♀ 14-15 October 1973. R. Flesk, 2♂♂21♀♀ 3-4 July 1973, ♂♀ 24-25 August 1973, ♂♂ 13-14 October 1973.

(b). Curraheen R., 7-8 July 1973 (NMI). R. Behy, 85♂♂172♀♀ 26-27 August 1973. R. Inny, 7♂♂3♀♀ 5-6 July 1973.

#### *Rhyacophila munda* McLachlan, 1862

(a). Killarney: Muckross Lake, Dundag Bay, ♂ 24-25 November 1973. R. Flesk, ♀ 24-25 August 1973, ♀ 13-14 October 1973.

(b). R. Behy, 3♂♂♀ 26-27 August 1973. R. Inny, 3♂♂ 5-6 July 1973.

*Rhyacophila munda* is a widespread species but the adults are taken less frequently than those of *R. dorsalis*.

### GLOSSOSOMATIDAE

#### *Agapetus delicatulus* McLachlan, 1884

(a). Killarney: L. Leane, Castlough Bay, ♀ 26-27 June 1973. Muckross Lake, Goleen Bay, ♀ 31 July-1 August 1973.

*Agapetus delicatulus* was thought to be confined to the southern half of the island but is now known from Co. Donegal.

#### *Agapetus fuscipes* Curtis, 1834

(a). Killarney: Muckross Lake, Brickeen, 2♀♀ 24-25 June 1973. R. Flesk, ♂♂♀♀ 3-4 July 1973, ♂♂♀♀ 24-25 August 1973.

(b). Curraheen R., ♂ 7-8 July 1973 (NMI).

***Agapetus ochripes* Curtis, 1834**

(a). Killarney: **L. Leane**, Castlough Bay, ♀ 13-14 July 1973. **Muckross Lake**, Colleen Baun Rock, ♀ 27-28 July 1973, Goleen Bay, ♀♀ 26-26 June 1973. **R. Flesk**, 16♂♂20♀♀ 3-4 July 1973, 67♂♂103♀♀ 24-25 August 1973.

(b). Curraheen **R.**, ♀♀ 7-8 July 1973 (NMI). **R. Galey**, 4♀♀ 28-29 August 1973.

***Glossosoma boltoni* Curtis, 1834**

(a). Killarney: **Doolough**, ♂ 2-3 July 1973. **L. Leane**, Dundag Bay, ♀♀ 13-14 April 1973. **Muckross Lake**, Colleen Baun Rock, ♀ 11-12 October 1972 (NMI), Goleen Bay, ♂♀ 24-25 June 1973, ♂ 16-17 July 1973, ♀ 31 July-1 August 1973, ♂ 14-15 October 1973, 2♂♂2♀♀ 25-26 October 1973. **R. Flesk**, 10♀♀ 3-4 July 1973, 14♂♂94♀♀ 24-25 August 1973, 36♂♂85♀♀ 13-14 October 1973.

(b). Curraheen **R.**, ♂ 7-8 July 1973. **Inch Strand (Q6400)**, attracted to a lamp while angling on the beach, ♀ 19 October 1973. **L. Currane**, ♀ 25-26 August 1973. **R. Galey**, ♂♂♀♀ 28-29 August 1973. **R. Inny**, 24♂♂33♀♀ 5-6 July 1973.

**HYDROPTILIDAE**

***Agraylea multipunctata* Curtis, 1834**

(a). Killarney: **Doolough**, ♂4♀♀ 23-24 August 1973. **L. Leane**, Castlough Bay, 24♂♂♀ 26-27 June 1973, 4♂♂ 13-14 July 1973, 50♂♂ 30 July 1973. **Muckross Lake**, Goleen Bay, ♂♂♀♀ 31 July-1 August 1973. **Upper Lake**, Long Range, ♂ 3-4 July 1973. **R. Flesk**, ♀ 3-4 July 1973.

***Hydroptila angulata* Mosely, 1922**

(a). Killarney: **Doolough**, ♂ 28-29 July 1973, ♂ 26-27 August 1987. **L. Leane**, Castlough Bay, ♂ 29-30 July 1973. **Muckross Lake**, Brickeen, 2♂♂25♀♀, Goleen Bay, 4♂♂14♀♀ 25-26 June 1973. **R. Flesk**, ♂ 3-4 July 1973.

*Hydroptila angulata* was only known from Cos Galway and Kerry but has now been taken in other counties.

***Hydroptila forcipata* (Eaton, 1873)**

(a). Killarney: Doolough, ♂♂♀♀ 2-3 July 1973. R. Flesk, 17 ♀♀ 3-4 July 1973, 11♂♂82♀♀ 24-25 August 1973, conf. J. E. Marshall (NMI).

(b). Curraheen R., ♀ 7-8 July 1973. L. Derriana, mountain stream entering lake, ♂♀ 1-13 July 1979 (NMI). R. Inny, ♂ 5-6 July 1973.

***Hydroptila pulchricornis* Pictet, 1834**

(a). Killarney: Doolough, ♂ 23-24 August 1973 (NMI).

The Doolough is one of the original sites where the species was first discovered in Ireland.

***Hydroptila sparsa* Curtis, 1834**

(a). Killarney: L. Leane, Castlough Bay, ♂ 29-30 July 1973.

***Hydroptila simulans* Mosely, 1920**

(b). R. Inny, 20♂♂21♀♀ 5-6 July 1973.

*Hydroptila simulans* is still unknown from the northern half of the island.

***Hydroptila tineoides* Dalman, 1819**

(a). Killarney: Doolough, ♂ 28-29 July 1973, ♂ 26-27 August 1987. L. Leane, Castlough Bay, ♂2♀♀ 26-27 June 1973, ♂ 29-30 July 1973. Muckross Lake, Colleen Baun Rock, ♂ 28-29 May 1974. R. Flesk, ♂ 24-25 August 1973, conf. J. E. Marshall (NMI).

(b). Curraheen R., ♂♂♀♀ 7-8 July 1973. L. Currane, 5♂♂6♀♀ 25-26 August 1973.

***Ithytrichia clavata* Morton, 1905**

(b). Curraheen R., 3♂♂♀♀ 7-8 July 1973 (2♂♂2♀♀ in NMI).

This was the first Irish record of *Ithytrichia clavata* (O'Connor, 1982). The species has since been found elsewhere in the county but is still unknown outside Kerry.

***Ithytrichia lamellaris* Eaton, 1873**

(a). Killarney: R. Flesk, 4♂♂5♀♀ 24-25 August 1973, conf. J. E. Marshall.

(b). R. Inny, 69♂♂615♀♀ 5-6 July 1973.

***Orthotrichia angustella* (McLachlan, 1865)**

(a). Killarney: Doolough, 3♂♂7♀♀ 28-29 July 1973. Muckross Lake, Colleen Baun Rock,



♂3♀♀ 27-28 July 1973.

These are some of the first specimens to be collected in Ireland. The species is known from three other counties.

***Oxyethira flavicornis* (Pictet, 1834)**

(a). Killarney: Doolough, 7♂♂24♀♀ 28-29 July 1973, 24♂♂105 23-24 August 1973, ♀♀♂♂♀♀ 26-27 August 1987. L. Leane, Castletlough Bay, 259♂♂1072♀♀ 26-27 June 1973, 33♂♂34 ♀♀ 13-14 July 1973, 445♂♂145♀♀ 29-30 July 1973. Muckross Lake, Brickeen, 4♂♂10♀♀ 25-26 June 1973, Colleen Baun Rock, ♂7♀♀ 28-29 July 1973, Goleen Bay, 7♂♂4♀♀ 31 July-1 August 1973. Upper Lake, Long Range, ♂♀♀ 3-4 July 1973.

(b). L. Currane, 48♂♂541♀♀ 25-26 August 1973.

***Oxyethira frici* Klapálek, 1891**

(a). Killarney: R. Flesk, ♂5♀♀ 24-25 August 1973.

(b). R. Behy, ♂ 6-7 July 1973. R. Inny, ♂♂♀♀ 5-6 July 1973.

*Oxyethira frici* is a rare species, seldom encountered.

***Oxyethira sagittifera* Ris, 1897**

(a). Killarney: Muckross Lake, Dundag Bay, 4♂♂ 4-5 July 1973.

Outside Kerry, *Oxyethira sagittifera* has only been found in Cos Galway and Mayo.

**PHILOPOTAMIDAE**

***Chimarra marginata* (Linnaeus, 1761)**

(a). Killarney: R. Flesk, ♂ 24-25 August 1973.

(b). Derriana L., mountain stream entering lake, ♂3♀♀ 1-13 July 1979 (NMI).

***Wormaldia subnigra* McLachlan, 1865**

(a). Killarney: Doolough, ♂ 11-12 October 1972.

The species does not occur in lakes so the specimen was probably attracted from a nearby large stream.

## ECNOMIDAE

### *Ecnomus tenellus* (Rambur, 1842)

(a). Killarney: Doolough, 7♂♂2♀♀ 2-3 July 1973, 20♂♂33♀♀ 28-29 July 1973, 7♂♂26♀♀ 23-24 August 1973. L. Leane, Castlough Bay, 120♂♂72♀♀ 26-27 June 1973, 37♂♂2♀♀ 13-14 July 1973, 77♂♂55♀♀ 30-31 July 1973. Muckross Lake, Colleen Baun Rock, 4♂♂198♀♀ 27-28 July 1973; Dundag Bay, 2♀♀ 4-5 July 1973; Goleen Bay, 2♂♂ 16-17 July 1973, 133♂♂304♀♀ 31 July-1 August 1973.

(b). L. Currane, 7♂♂92♀♀ 25-26 August 1973.

## POLYCENTROPODIDAE

### *Cyrnus trimaculatus* (Curtis, 1834)

(a). Killarney: Doolough, ♀ 2-3 July 1973, ♂♀ 23-24 August 1973. L. Leane, Castlough Bay, ♂♂ 26-27 June 1973. Muckross Lake, Colleen Baun Rock, 5♂♂9♀♀ 27-28 July 1973; Dundag Bay, 4♂♂ 4-5 July 1973; Goleen Bay, ♀♀ 16-17 July 1973, 7♀♀ 31 July-1 August 1973. R. Flesk, ♀ 3-4 July 1973.

(b). L. Currane, 9♀♀ 25-26 August 1973. R. Galey, ♀ 28-29 August 1973.

### *Holocentropus dubius* (Rambur, 1842)

(a). Killarney: Doolough, 2♂♂ 2-3 July 1973.

*Holocentropus dubius* is a much rarer species than *H. picicornis*, having only been recorded from five other counties.

### *Holocentropus picicornis* (Stephens, 1836)

(a). Killarney: L. Leane, Castlough Bay, ♂ 26-27 June 1973.

(b). L. Currane, 190♂♂1458♀♀ 25-26 August 1973.

### *Neureclipsis bimaculata* (Linnaeus, 1758)

(a). Killarney: Muckross Lake, Colleen Baun Rock, 6♂♂ 27-28 July 1973.

### *Plectrocnemia conspersa* (Curtis, 1834)

(a). Killarney: Upper Lake, near Long Range, ♀ 3-4 July 1973.

(b). **Derriana L.**, mountain stream entering lake, ♂♂♀ 1-13 July 1979 (NMI). **R. Inny**, 2♂♂ 5-6 July 1973.

***Plectrocnemia geniculata* McLachlan, 1871**

(b). **Derriana L.**, mountain stream entering lake, 3♂♂♀ 1-13 July 1979 (NMI).

***Polycentropus flavomaculatus* (Pictet, 1834)**

(a). **Killarney: Doolough**, ♂♂ 2-3 July 1973, 3♂♂ 28-29 July 1973, 27♂♂ 23-24 August 1973. **L. Leane**, Castlelough Bay, 8♂♂ 26-27 June 1973, 2♂♂ 13-14 July 1973, 7♂♂15♀♀ 29-30 July 1973. **Muckross Lake**, Brickeen, 39♂♂16♀♀ 25-26 June 1973; **Colleen Baun Rock**, 3♂♂♀ 2-3 July 1973, 67♂♂ 27-28 July 1973; **Dundag Bay**, 2♂♂ 21-22 June 1973, 4♂♂ 4-5 July 1973; **Goleen Bay**, 29♂♂19♀♀ 16-17 July 1973. **Upper Lake**, near Long Range, ♂♂ 3-4 July 1973. **R. Flesk**, 23♂♂ 3-4 July 1973, 26♂♂14♀♀ 24-25 August 1973.

(b). **Curraheen R.**, 2♂♂ 7-8 July 1973 (NMI). **L. Currane**, ♂ 25-26 August 1973. **R. Inny**, 18♂♂3♀♀ 5-6 July 1973.

***Polycentropus irroratus* (Curtis, 1835)**

(a). **Killarney: Doolough**, ♂ 2-3 July 1973, 10♂♂ 28-29 July 1973. **L. Leane**, Castlelough Bay, ♂ 26-27 June 1973, ♂ 13-14 July 1973, ♂ 23-24 August 1973. **Muckross Lake**, Colleen Baun Rock, 7♂♂ 27-28 July 1973; **Goleen Bay**, ♂ 16-17 July 1973 (NMI). **R. Flesk**, ♂ 24-25 August 1973.

(b). **L. Currane**, ♂ 25-26 August 1973, 4♂♂ 25-26 August 1973. **R. Inny**, 4♂♂ 5-6 July 1973.

***Polycentropus kingi* McLachlan, 1871**

(b). **R. Inny**, 2♂♂ 5-6 July 1973.

**PSYCHOMYIIDAE**

***Lype phaeopa* (Stephens, 1836)**

(a). **Killarney: Doolough**, ♂ 28-29 July 1973. **R. Flesk**, ♀ 24-25 August 1973.

***Lype reducta* (Hagen, 1868)**

(a). **Killarney: R. Flesk**, ♂ 24-25 August 1973, conf. J. M. Edington (NMI).

Adults of *Lype reducta* are rarely taken compared with *L. phaeopa*. The above adult was the first one to be recognised in Ireland.

***Psychomyia pusilla* (Fabricius, 1781)**

(a). **Killarney: Doolough**, ♂ 2-3 July 1973, ♂7♀♀ 28-29 July 1973, ♀ 23-24 August 1973. **L. Leane**, Castlough Bay, 16♂♂94♀♀ 26-27 June 1973, 2♂♂10♀♀ 13-14 July 1973, 5♂♂♀ 29-30 July 1973. **Muckross Lake**, Colleen Baun Rock, ♂♂♀♀ 27-28 July 1973; **Goleen Bay**, ♀ 16-17 July 1973. **R. Flesk**, 3♂♂38♀♀ 3-4 July 1973, 12♂♂26♀♀ 24-25 August 1973.

(b). **R. Inny**, 84♂♂486♀♀ 5-6 July 1973.

***Tinodes waeneri* (Linnaeus, 1758)**

(a). **Killarney: Doolough**, 6♂♂12♀♀ 23-24 August 1973, ♂17♀♀ 12-13 October 1973. **L. Leane**, Castlough Bay, ♂♀ 26-27 June 1973, ♂ 13-14 July 1973, 2♂♂♀ 29-30 July 1973, ♂ 18-19 November 1973. **Muckross Lake**, Colleen Baun Rock, 6♂♂3♀♀ 11-12 October 1972 (NMI), ♂ 27-28 July 1973; **Goleen Bay**, ♀ 25-26 October 1973, 2♀♀ 16-17 July 1973. **R. Flesk**, 2♂♂♀ 24-25 August 1973.

(b). **L. Currane**, 46♂♂104♀♀ 25-26 August 1973. **R. Galey**, 2♂♂2♀♀ 28-29 August 1973. **R. Inny**, 3♂♂6♀♀ 5-6 July 1973.

**HYDROPSYCHIDAE**

***Cheumatopsyche lepida* (Pictet, 1834)**

(a). **Killarney: L. Leane**, Castlough Bay, 23♀♀ 26-27 June 1973, ♀ 13-14 July 1973. **Muckross Lake**, **Goleen Bay**, 3♀♀ 31 July-1 August 1973. **R. Flesk**, 18♂♂12♀♀ 3-4 July 1973 (NMI), 5♀♀ 24-25 August 1973.

***Hydropsyche angustipennis* (Curtis, 1834)**

(b). **R. Galey**, 15♂♂ 28-29 August 1973, (NMI).

All the specimens had an open median cell in the hind wing

***Hydropsyche contubernalis* McLachlan, 1865**

(b). **R. Galey**, 47♂♂120♀♀ 28-29 August 1973 (NMI).

***Hydropsyche pellucidula* (Curtis, 1834)**

(b). **Curraheen R.**, ♂♂♀♀ 7-8 July 1973 (NMI). **Derriana L.**, mountain stream entering lake, 3♂♂ 1-13 July 1979 (NMI).

***Hydropsyche siltalai* Döhler, 1963**

(a). **Killarney: Muckross Lake**, Goleen Bay, ♂15♀♀ 31 July-1 August 1973. **R. Flesk**, 18♂♂4♀♀ 3-4 July 1973, 7♂♂16♀♀ 24-25 August 1973.

(b). **Curraheen R.**, 3♂♂9♀♀ 7-8 July 1973 (NMI). **Derriana L.**, mountain stream entering lake, 5♂♂ 1 July-13 July 1979 (NMI). **R. Behy**, 13♂♂22♀♀ 26-27 August 1973. **R. Galey**, ♂ 28-29 August 1973. **R. Inny**, 80♂♂78♀♀ 5-6 July 1973.

**PHRYGANEIDAE**

***Agrypnia varia* (Fabricius, 1793)**

(a). **Killarney: Doolough**, ♂♂ 28-29 July 1973, 4♂♂ 25-26 August 1973. **L. Leane**, Castlough Bay, ♀ 29-30 July 1973. **Muckross Lake**, Colleen Baun Rock, ♂ 27-28 July 1973 (NMI); Goleen Bay, ♀ 31 July-1 August 1973.

(b). **L. Currane**, 2♂♂2♀♀ 25-26 August 1973.

***Phryganea grandis* Linnaeus, 1758**

(a). **Killarney: Doolough**, 3♂♂♀ 2-3 July 1973. **Muckross Lake**, Goleen Bay, ♂ 16-17 July 1973. **R. Flesk**, ♂ 3-4 July 1973.

**GOERIDAE**

***Goera pilosa* (Fabricius, 1775)**

(a). **Killarney: Doolough**, 4♂♂ 2-3 July 1973, 2♀♀ 28-29 July 1973. **L. Leane**, Castlough Bay, ♂5♀♀ 26-27 June 1973, 10♂♂♀ 13-14 July 1973, ♂4♀♀ 29-30 July 1973; Ross Island, ♀ 17-18 July 1973. **Muckross Lake**, Brickeen, ♂♀ 25-26 June 1973; Colleen Baun Rock, ♂ 2-3 July 1973, 2♂♂10♀♀ 27-28 July 1973 (NMI); Dundag Bay, ♀ 4-5 July 1973; Goleen Bay, ♀♀ 31 July-1 August 1973. **R. Flesk**, 2♀♀ 3-4 July 1973.

(b). **R. Galey**, ♂♀♀ 28-29 August 1973. **R. Inny**, 3♀♀ 5-6 July 1973.

***Silo pallipes* (Fabricius, 1781)**

(a). **Killarney: R. Flesk**, ♂ 24-25 August 1973.

(b). **Curraheen R.**, 4♂♂3♀♀ 7-8 July 1973 (NMI). **R. Behy**, ♂ 26-27 August 1973. **R. Galey**, ♂ 28-29 August 1973. **R. Inny**, 4♂♂ 5-6 July 1973.

**LEPIDOSTOMATIDAE**

***Lepidostoma hirtum* (Fabricius, 1775)**

(a). **Killarney: Doolough**, 8♀♀ 2-3 July 1973, ♀♀ 28-29 July 1973, 6♀♀ 23-24 August 1973.

**L. Leane**, Castlough Bay, ♂4♀♀ 26-27 June 1973. **Muckross Lake**, Brickeen, 3♀♀ 26-27 June 1973; Colleen Baun Rock, ♀ 2-3 July 1973, 51♀♀ 27-28 July 1973; Goleen Bay, 14 ♀♀ 25-26 June 1973, 3♀♀ 31 July-1 August 1973. **R. Flesk**, 5♂♂5♀♀ 3-4 July 1973, ♂4♀♀ 24-25 August 1973.

(b). **Curraheen R.**, ♂♂ 7-8 July 1973. **L. Currane**, ♀♀ 25-26 August 1973. **R. Inny**, 23♂♂22♀♀ 5-6 July 1973.

**LIMNEPHILIDAE**

***Glyphotaelius pellucidus* (Retzius, 1783)**

(a). **Killarney: Doolough**, 4♂♂ 23-24 August 1973, ♂♂♀♀ 26-27 August 1987. **Muckross Lake**, Colleen Baun Rock, ♂ 11-12 October 1972 (NMI).

(b). **R. Galey**, ♂ 28-29 August 1973.

***Halesus digitatus* (Schrank, 1781)**

(a). **Killarney: Doolough**, ♂ 12-13 October 1972. **Muckross Lake**, Colleen Baun Rock, ♂ 11-12 October 1972 (NMI); Goleen Bay, 2♀♀ 14-15 October 1973. **R. Flesk**, ♂ 13-14 October 1973.

The adults of *Halesus digitatus* are rarely taken compared with those of *H. radiatus*. Although the latter species occurs in lakes, the above adults of *H. digitatus*, taken in the lake-

side traps, probably originated in nearby streams or rivers.

***Halesus radiatus* (Curtis, 1834)**

(a). **Killarney: Doolough**, ♂♀ 12-13 October 1972. **Muckross Lake**, Colleen Baun Rock, ♀ 11-12 October 1972 (NMI).

(b). **Curraheen R.**, 4♂♂ 17-18 September 1973.

***Limnephilus affinis* Curtis, 1834**

(a). **Killarney: Doolough**, ♀ 12-13 October 1973.

(b). **L. Gill**, ♀ 27-28 August 1973. **R. Galey**, ♀ 28-29 August 1973.

***Limnephilus auricula* Curtis, 1834**

(a). **Killarney: Castlough Bay**, 2♂♂5♀♀ 26-27 August 1987.

***Limnephilus centralis* Curtis, 1834**

(a). **Killarney: Doolough**, ♂♀ 26-27 August 1987; **L. Leane**, Castlough Bay, ♂ 26-27 August 1987. **R. Flesk**, ♂ 24-25 August 1973.

(b). **Derriana L.**, mountain stream entering lake, ♂♂♀♀ 1-13 July 1979 (NMI). **R. Behy**, ♂ 26-27 August 1973.

***Limnephilus elegans* Curtis, 1834**

(a.) **Killarney: Muckross Lake**, Goleen Bay, ♂ 25-26 June 1973.

***Limnephilus flavicornis* (Fabricius, 1787)**

(a). **Killarney: Doolough**, 113♂♂♀ 12-13 October 1972, 4♂♂3♀♀ 2-3 July 1973, 4♂♂ 28-29 July 1973, 9♂♂57♀♀ 23-24 August 1973, ♂♂♀♀ 26-27 August 1987. **Muckross Lake**, Colleen Baun Rock, ♂ 11-12 October 1972; **Goleen Bay**, ♂ 25-26 June 1973, ♂ 16-17 July 1973, ♂ 14-15 October 1973.

***Limnephilus griseus* (Linnaeus, 1758)**

(b). **Behy R.**, ♂ 26-27 August 1973 (NMI).

***Limnephilus lunatus* Curtis, 1834**

(a). **Killarney: Doolough**, 5♂♂5♀♀ 23-24 August 1973, 59♂♂42♀♀ 12-13 October 1973. **L. Leane**, Castlough Bay, 2♂♂2♀♀ 20-21 October 1973, ♂ 18-19 November 1973. **Muckross**

**Lake**, Dundag Bay, ♂ 17-18 October 1973, 2♂♂2♀♀ 25-26 October 1973; Goleen Bay, 2♂♂ 14-15 October 1973. **R. Flesk**, 2♂♂ 24-25 August 1973.

(b). **L. Currane**, ♂ 25-26 August 1973. **R. Behy**, ♂ 26-27 August 1973. **R. Galey**, 4♂♂3♀♀ 28-29 August 1973.

***Limnephilus luridus* Curtis, 1834**

(b). **Derriana L.**, mountain stream entering lake, ♂♂♀♀ 1-13 July 1979 (NMI). **R. Inny**, 2♀♀ 5-6 July 1973.

***Limnephilus marmoratus* Curtis, 1834**

(a). **Killarney: Doolough**, 2♂♂ 2-3 July 1973, 3♂♂3♀♀ 28-29 July 1973, 3♀♀ 23-24 August 1973. **L. Leane**, Castlelough Bay, ♂ 26-27 June 1973, ♀ 29-30 July 1973. **Muckross Lake**, Dundag Bay, ♂♀ 21-22 June 1973, ♂♀ 4-5 July 1973; Goleen Bay, 2♂♂ 25-26 October 1973.

(b). **Curraheen R.**, ♂ 7-8 July 1973 (NMI). **L. Currane**, 2♀♀ 25-26 August 1973. **L. Gill**, ♀♀ 27-28 August 1973. **R. Galey**, ♂ 28-29 August 1973.

***Limnephilus sparsus* Curtis, 1834**

(a). **Killarney: Doolough**, ♂♂ 12-13 October 1972. **L. Leane**, Castlelough Bay, ♂ 29-30 July 1973.

(b). **Derriana L.**, mountain stream entering lake, ♂♀ 1-13 July 1979 (NMI). **L. Currane**, ♂ 25-26 August 1973. **R. Behy**, 2♀♀ 26-27 August 1973.

***Limnephilus vittatus* (Fabricius, 1798)**

(a). **Killarney: Doolough**, ♂ 23-24 August 1973. **L. Leane**, Castlelough Bay, ♀ 29-30 July 1973.

***Mesophylax impunctatus* McLachlan, 1884**

(a). **Killarney: Doolough**, 56♂♂62♀♀ 12-13 October 1973. **L. Leane**, Castlelough Bay, 2♂♂2♀♀ 20-21 October 1973, ♀ 18-19 November 1973, ♂ 24-25 November 1973. **Muckross Lake**, Colleen Baun Rock, 68♂♂149♀♀ 11-12 October 1972, conf. A. Brindle (NMI), 82♂♂117♀♀ 14-15 October 1973; Dundag Bay, 3♀♀ 17-18 October 1973; Goleen Bay, ♀ 25-26 June 1973, 23♂♂50♀♀ 25-26 October 1973.



Although the adults often occur in large numbers at a particular site, *Mesophylax impunctatus* is local in distribution and only known from five other counties.

***Potamophylax cingulatus* (Stephens, 1837)**

(b). **R. Behy**, ♂ 26-27 August 1973.

***Potamophylax latipennis* (Curtis, 1834)**

(a). **Killarney: Doolough**, ♂ 12-13 October 1972. **Muckross Lake**, Goleen Bay, ♂ 16-17 July 1973. **R. Flesk**, 7♂♂8♀♀ 3-4 July 1973, 20♂♂16♀♀ 24-25 August 1973.

(b). **Curraheen R.**, 16♂♂2♀♀ 7-8 July 1973 (NMI). **L. Currane**, ♂ 25-26 August 1973.

***Stenophylax permistus* McLachlan, 1895**

(a). **Killarney: Doolough**, 9♂♂12♀♀ 12-13 October 1972, 4♂♂3♀♀ 23-24 August 1973, 2♀♀ 26-27 August 1987. **Muckross Lake**, Colleen Baun Rock, ♂♀ 11-12 October 1972; Goleen Bay, 3♂♂2♀♀ 14-15 October 1973.

(b). **R. Behy**, ♀ 26-27 August 1973. **R. Galey**, ♂ 28-29 August 1973.

**SERICOSTOMATIDAE**

***Sericostoma personatum* (Spence, 1826)**

(a). **Killarney: Doolough**, 3♀♀ 2-3 July 1973. **L. Leane**, Castlough Bay, ♀♀ 26-27 June 1973; Ross Island, ♀ 17-18 July 1973. **Muckross Lake**, Brickeen, ♀ 25-26 June 1973; Colleen Baun Rock, 5♀♀ 2-3 July 1973, ♂ 27-28 July 1973 (NMI); Dundag Bay, 7♀♀ 4-5 July 1973; Goleen Bay, 2♀♀ 25-26 June 1973, ♀ 16-17 July 1973. **R. Flesk**, ♂ 3-4 July 1973, ♀ 24-25 August 1973.

**ODONTOCERIDAE**

***Odontocerum albicorne* (Scopoli, 1763)**

(a). **Killarney: R. Flesk**, 6♂♂ 3-4 July 1973, 18♂♂3♀♀ 24-25 August 1973.

(b). **L. Derriana**, mountain stream entering lake, ♂ 1-13 July 1979 (NMI). **R. Inny**, ♂ 5-6 July 1973.

## LEPTOCERIDAE

### *Athripsodes albifrons* (Linnaeus, 1758)

(a). Killarney: Doolough, ♂ 28-29 July 1973 and 2♂♂ 23-24 August 1973. L. Leane, Castlough Bay, 4♂♂ 26-27 June 1973 and 7♂♂ 29-30 July 1973. Muckross Lake, Colleen Baun Rock, 4♂♂ 27-28 July 1973. R. Flesk, ♂ 3-4 July 1973 and ♂3♀♀ 24-25 August 1973.

(b). R. Inny, 2♂♂ 5-6 July 1973.

### *Athripsodes aterrimus* (Stephens, 1836)

(a). Killarney: L. Leane, Castlough Bay, ♂ 29-30 July 1973. Muckross Lake, Brickeen, ♂ 25-26 June 1973.

### *Athripsodes cinereus* (Curtis, 1834)

(a). Killarney: L. Leane, Castlough Bay, 63♂♂30♀♀ 26-27 June 1973, 7♂♂3♀♀ 13-14 July 1973, 26♂♂14♀♀ 29-30 July 1973; Ross Island, 50♂♂♀ 17-18 July 1973. Muckross Lake, Colleen Baun Rock, 4♀♀ 27-28 July 1973; Dundag Bay, ♂ 21-22 June 1973, ♂ 4-5 July 1973; Goleen Bay, 197♂♂45♀♀ 31 July-1 August 1973.

(b). L. Currane, 34♂♂35♀♀ 25-26 August 1973. R. Inny, ♂2♀♀ 5-6 July 1973.

### *Athripsodes commutatus* (Rostock, 1874)

(a). Killarney: R. Flesk, ♂ 3-4 July 1973.

(b). R. Galey, 7♂♂4♀♀ 28-29 August 1973. R. Inny, ♂♀ 5-6 July 1973.

### *Ceraclea albimacula* (Rambur, 1842)

(a). Killarney: Doolough, ♂ 28-29 July 1973. Muckross Lake, ♂ 27-28 July 1973.

(b). R. Inny, ♂ 5-6 July 1973.

### *Ceraclea dissimilis* (Stephens, 1836)

(a). Killarney: Doolough, 6♂♂ 2-3 July 1973, 5♂♂6♀♀ 28-29 July 1973, 7♂♂7♀♀ 23-24 August 1973, 3♂♂ 26-27 August 1987. L. Leane, Castlough Bay, 2♂♂2♀♀ 26-27 June 1973, 2♀♀ 29-30 July 1973, ♂♂♀ 26-27 August 1987. Muckross Lake, Colleen Baun Rock, 22♂♂4♀♀ 27-28 July 1973 (NMI); Dundag Bay, ♂ 21-22 June 1973; Goleen Bay, 3♂♂ 25-26 June 1973.

(b). **L. Currane**, 9♂♂26♀♀ 25-26 August 1973.

***Ceraclea fulva* (Rambur, 1842)**

(a). **Killarney: Doolough**, ♂♂ 2-3 July 1973, ♂♀♀ 28-29 July 1973, ♂ 23-24 August 1973. **L. Leane**, Castlough Bay, ♂♀ 26-27 June 1973. **Muckross Lake**, Goleen Bay, ♂ 25-26 June 1973, ♂♂♀ 31 July-1 August 1973.

***Ceraclea senilis* (Burmeister, 1839)**

(a). **Killarney: Doolough**, 2♀♀ 28-29 July 1973. **L. Leane**, Castlough Bay, 2♂♂ 29-30 July 1973.

***Mystacides azurea* (Linnaeus, 1761)**

(a). **Killarney: Doolough**, 4♂♂2♀♀ 2-3 July 1973. **L. Leane**, Castlough Bay, ♂♂2♀♀ 26-27 June 1973, ♀ 13-14 July 1973, 2♂♂♀ 29-30 July 1973. **Muckross Lake**, Colleen Baun Rock, ♂ 2-3 July 1973; Dundag Bay, ♂ 4-5 July 1973; Goleen Bay, 5♂♂2♀♀ 25-26 June 1973, 3♂♂ 31 July-1 August 1973, ♂ 16-17 July 1973.

(b). **L. Currane**, 8♂♂7♀♀ 25-26 August 1973. **R. Galey**, 13♂♂11♀♀ 28-29 August 1973.

***Mystacides longicornis* (Linnaeus, 1758)**

(a). **Killarney: Doolough**, 16♂♂13♀♀ 2-3 July 1973. **L. Leane**, Castlough Bay, 13♂♂3♀♀ 26-27 June 1973, 4♂♂ 13-14 July 1973, 6♂♂♀ 29-30 July 1973.

(b). **L. Currane**, 11♂♂♀ 25-26 August 1973. **R. Inny**, ♂ 5-6 July 1973.

***Oecetis furva* (Rambur, 1842)**

(a). **Killarney: Doolough**, 3♂♂ 2-3 July 1973. **Muckross Lake**, Goleen Bay, ♂ 16-17 July 1973.

(b). **L. Currane**, ♂ 25-26 August 1973.

***Oecetis lacustris* (Pictet, 1834)**

(a). **Killarney: Doolough**, 4♀♀ 23-24 August 1973. **L. Leane**, Castlough Bay, ♂4♀♀ 26-27 June 1973, 6♂♂12♀♀ 29-30 July 1973. **Muckross Lake**, Dundag Bay, ♂ 21-22 June 1973.

(b). **L. Currane**, 44♂♂424♀♀ 25-26 August 1973.

***Oecetis ochracea* (Curtis, 1825)**

(a). Killarney: Doolough, ♂ 2-3 July 1973. L. Leane, Castlelough Bay, ♀ 26-27 June, ♂ 13-14 July 1973, ♂ 29-30 July 1973. Muckross Lake, Colleen Baun Rock, 2♀♀ 27-28 July 1973; Dundag Bay, 2♂♂ 4-5 July 1973; Goleen Bay, 4♂♂ 31 July-1 August 1973.

(b). R. Inny, ♂ 5-6 July 1973.

***Oecetis testacea* (Curtis, 1834)**

(a). Killarney: Doolough, ♀ 2-3 July 1973, 2♂♂♀ 26-27 August 1987. Muckross Lake, Colleen Baun Rock, ♂ 27-28 July 1973 (NMI); Goleen Bay, ♂2♀♀ 16-17 July 1973. (b). R. Flesk, ♂ 3-4 July 1973.

***Setodes argentipunctellus* McLachlan, 1877**

(a). Killarney: Doolough, 5♀♀ 23-24 August 1973 (2♀♀ NMI). L. Leane, ♂ 29-30 July 1973 (NMI). Muckross Lake, 3♀♀ 31 July-1 August 1973.

In Ireland, *Setodes argentipunctellus* only occurs in the Killarney area (L. Leane and Muckross Lake) of Co. Kerry. The known Irish larval habitat is an exposed rocky lake shore. In Britain, it has a similar habitat (stony lake shores) but the species has also been found in stony rivers (Wallace, 1991; Barnard and Ross, 2012).

McLachlan (1877), when describing *S. argentipunctellus* as a new species from Muckross material (and a specimen from Windermere), remarked that A. E. Eaton had observed the species coming up in great quantities from the lake at dusk on the 18 August 1887. King and Halbert (1910) added that it also occurred in great profusion at Ross Castle on L. Leane. It is surprising therefore that so few specimens were taken in the light-traps which were run during the flight period and that no adults were collected during the day using a net. Only one larva was found by the author in a qualitative collection on an exposed rocky shore in Muckross Lake and none in the quantitative collections (O'Connor and Wise, 1984). In June 1972, Dr Ian Wallace collected seven final instar larvae and reared two adults. The sampling sites were on L. Leane (Castlelough Bay V9686 by Brickeen Bridge V9385) and Muckross Lake (Dundag Bay V9686 and Goleen V9685). The samples were combined so the numbers at each site were not

noted (Wallace pers. comm.). Afterwards, Wise and O'Sullivan (1980) conducted an intensive study of the benthic macroinvertebrates in Ross Bay but found no specimens. Sampling took place in July and this may have been too late to find larvae. It is also interesting that Wallace (2009) noted that you will struggle to find larvae at sites outside Lake Windermere.

At the time the author was running light-traps on L. Leane and Muckross Lake, the Limnology Unit of University College Dublin was conducting studies on eutrophication problems in both lakes (1971-1975). Untreated sewage had been entering L. Leane at Ross Castle from Killarney town and Muckross Lake at Dundag Bay from Muckross House for many years (Bracken *et al.*, 1977; O'Connor and Wise, 1984). The findings clearly demonstrated that L. Leane was undergoing a process of accelerating cultural eutrophication. Since then the lake, while naturally mesotrophic, has become eutrophic (highly nutrient loaded) due mainly to agricultural run-off, discharge from the Killarney Wastewater Treatment Plant and septic tanks within the lake's catchment. The effects of this process of eutrophication were initially concentrated in Ross Bay, but chemical and biological changes later extended to other parts, culminating in severe algal blooms throughout the lake during the summers of 1983, 1984 and 1997. The improvement in water quality in the 1980's was due to the introduction of phosphorus removal at the Killarney Wastewater Treatment Plant (National Parks and Wildlife Service, 2005). The decline in water quality over many years at Ross Castle and Muckross may have had an adverse effect on the nearby populations of *S. argentipunctellus* but healthy populations may yet survive in unpolluted parts of Muckross Lake. Because of the species rarity in Ireland, the possible reduction in the numbers of adults since the nineteen hundreds is a matter of concern and will require further investigation.

***Triaenodes bicolor* (Curtis, 1834)**

(a). Killarney: L. Leane, Castlough Bay, 2♂♂ 26-27 June 1973, ♂ 13-14 July 1973, ♂ 29-30 July 1973.

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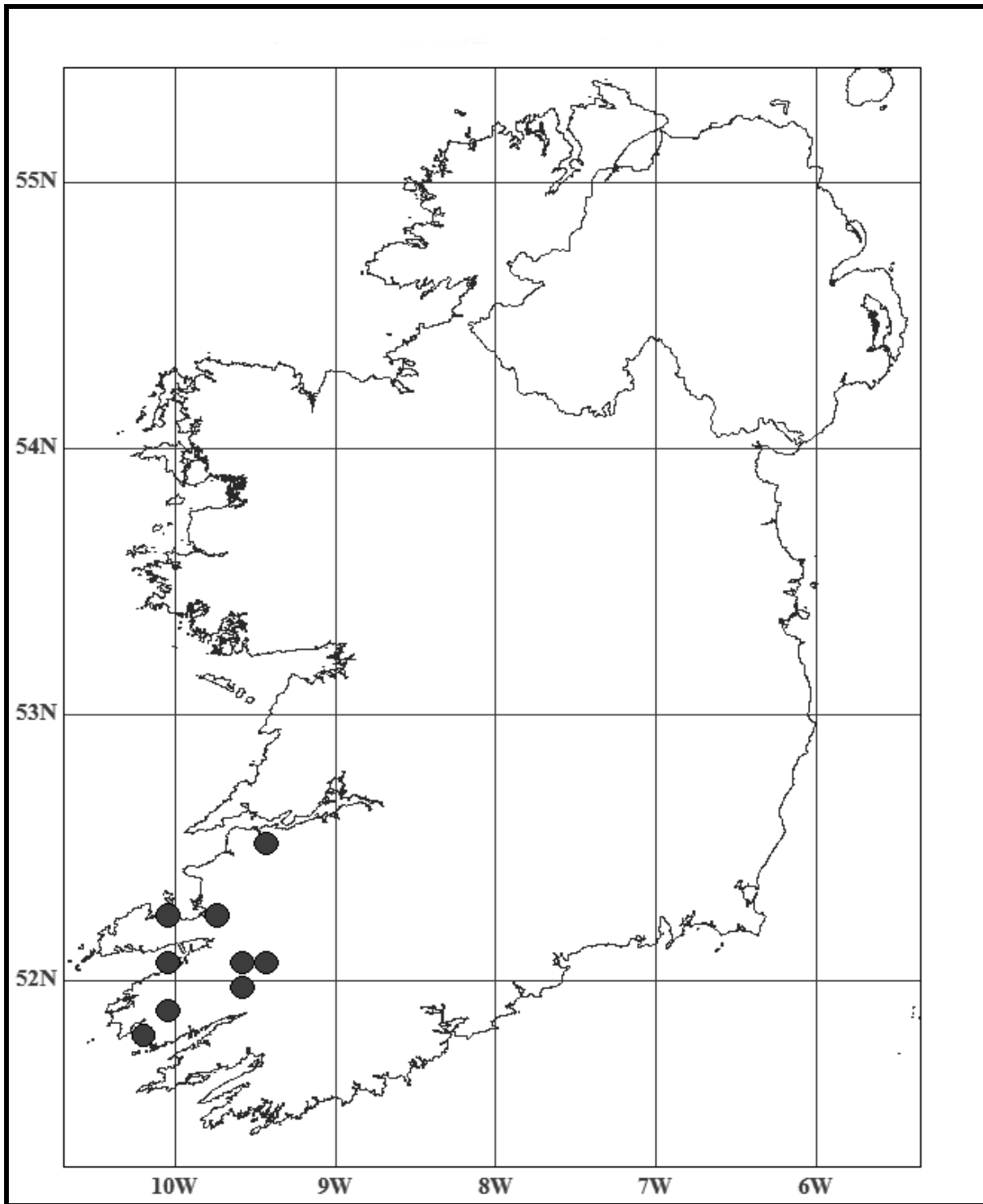
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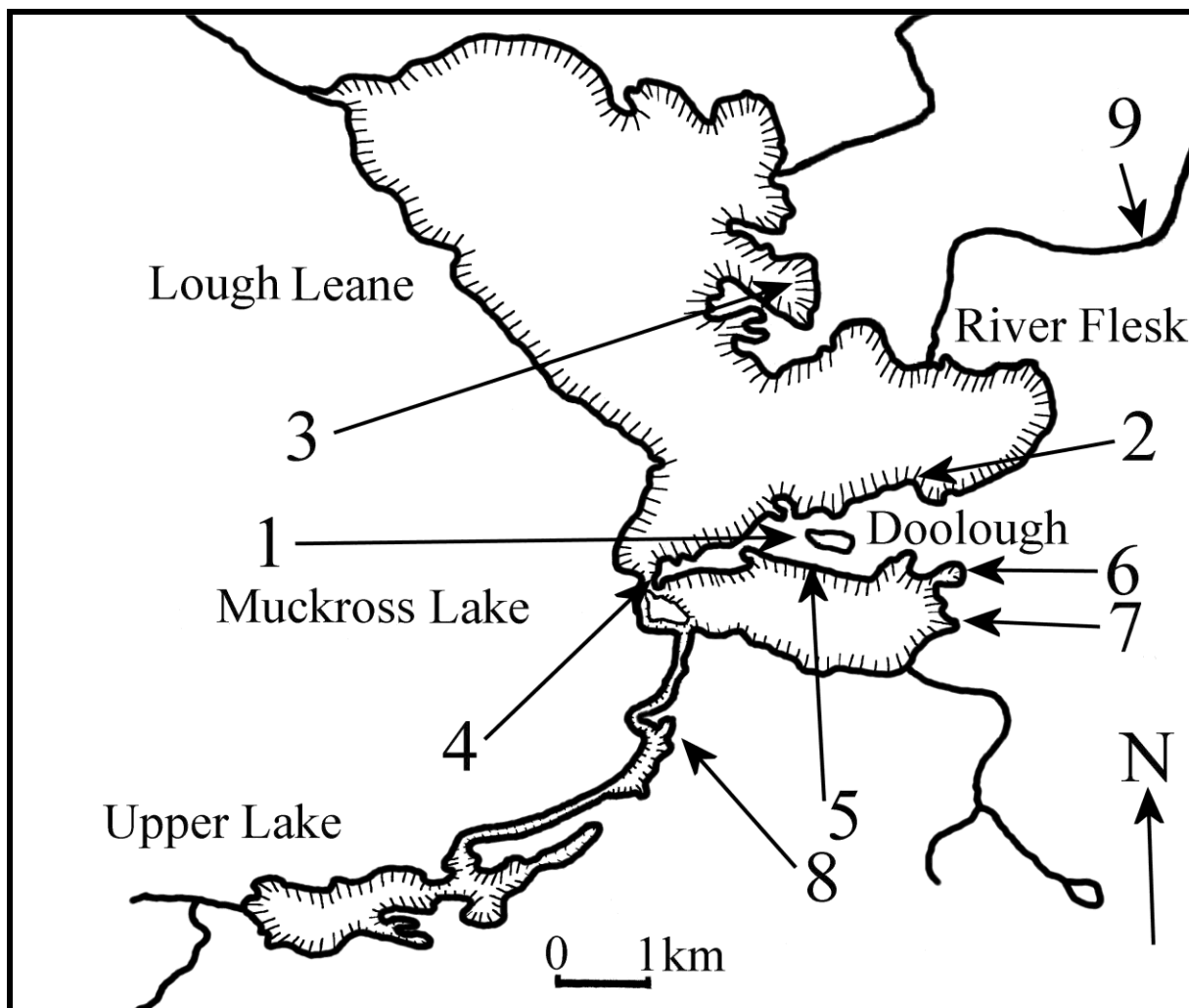
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**FIGURE 1.** The distribution of the light-traps.

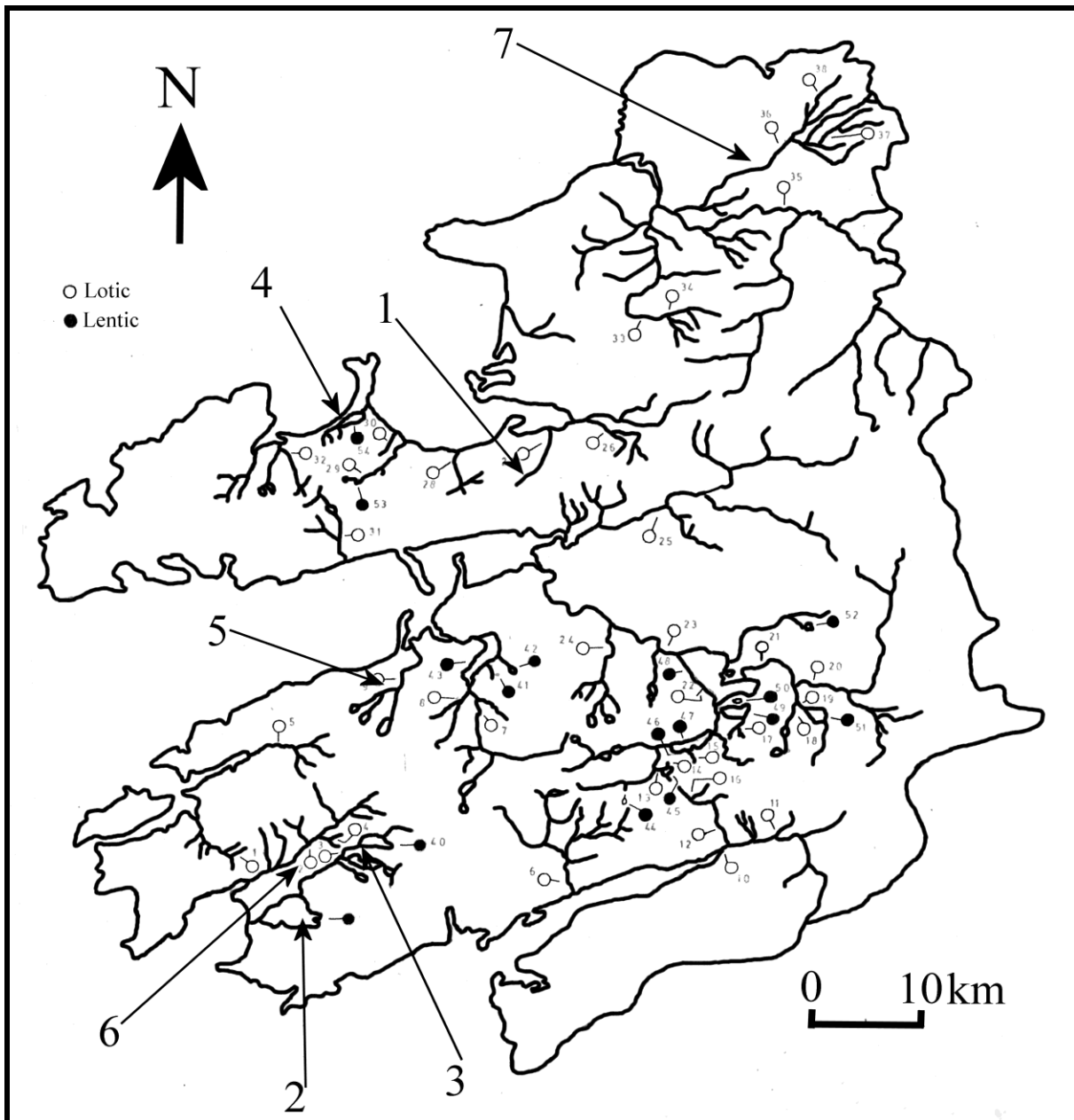




**FIGURE 2.** Light-trap sites in the Killarney area. 1 = Doolough; 2 = Lough Leane, Castlelough Bay; 3 = Lough Leane, Ross Island overlooking Ross Bay (arrowed); 4 = Muckross Lake, Brickeen Bridge; 5 = Muckross Lake, Colleen Baun; 6 = Muckross Lake, Dundag Bay; 7 = Muckross Lake, Goleen Bay; 8 = Upper Lake, Long range; 9 = River Flesk, upstream of Flesk Bridge.



**FIGURE 3.** Light-trap sites outside the Killarney area. 1 = Curraheen River; 2 = Lough Currane; 3 = Lough Derriana stream; 4 = Lough Gill; 5 = River Behy; 6 = River Inny; 7 = River Galey. The sampling sites for the 1972-1974 field work are also shown.



## **SOME RECORDS OF ADULT STONEFLIES (PLECOPTERA) FROM IRELAND**

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### **Abstract**

Adult distribution records are given for twelve species of Irish stoneflies (Plecoptera).

**Key words:** Plecoptera, stoneflies, Ireland, adults, distribution

### **Introduction**

The first list of Irish stoneflies was compiled by King (1887-1888) who reported 11 species. Later, King and Halbert (1910) updated the list, providing distributional data on 18 species. One of these, *Capnia atra* Morton, was considered to be doubtful by Hynes (1977). However, O'Connor (1978) was able to confirm the species as Irish. Another species *Nemoura avicularis* Morton was collected by JPOC in Co. Wicklow (O'Connor and Bracken, 1980), bringing the total to 19 species. Costello (1988) provided a comprehensive review of their Irish distributions. Subsequently, the senior author discovered *Leuctra nigra* (Olivier) in Co. Cavan (O'Connor and Costello, 1997). The species has since been found in south-west Ireland (O'Connor, 2005). Ashe, O'Connor and Murray (1998) provided a checklist of the 20 species. A more detailed checklist is given by O'Connor and Nelson (2012).

The authors have collected adult stoneflies in many parts of Ireland on field-work. These have been identified using Hynes (1977) and the data are presented here. Some adults were difficult to identify definitely and these were sent to Dr M. J. Costello for his opinion. The layout follows Costello (1988) in using vice-counties. Grid references are included for each site. Maps are also provided showing the distribution records which are plotted using longitude and latitude. The nomenclature follows O'Connor and Nelson (2012). The following abbreviations

and symbols are used in the text:- JPOC = J. P. O'Connor; MAOC = M. A. O'Connor; \* = new vice-county record according to Costello (1988); \*\* = confirmed earlier record (pre 1940 or post 1940 unconfirmed in Costello, 1988). Voucher specimens have been deposited in the National Museum of Ireland.

## Records

### LEUCTRIDAE

#### *Leuctra fusca* (Linnaeus, 1758) (Fig. 1)

\***CARLOW (H13)**: St Mullins (S7238), River Barrow, ♀ 15 August 1994, Kevin O'Connor. **CLARE (H9)**: Caher River (M1508), Burren, ♀ 17 July 1981, JPOC. \*\***DUBLIN (H21)**: Slade of Saggart (O0324), stream, ♂ 7 August 1981, JPOC. **LEITRIM (H29)**: Glencar Waterfall (G7643), 3♂♂ 25 August 1992, JPOC; Bonet River (G8031), 2♂♂ 6 August 1989, JPOC. \*\***MEATH (H22)**: River Boyne near Navan (N8868), ♀ 1 October 1992, JPOC. **NORTH KERRY (H2)**: Kenmare Estate (V9590), Deenagh River, Killarney, ♂♂♀♀ 8 September 1981, JPOC; river at Galway's Bridge (V9180), Killarney, ♀ 9 September 1981, JPOC. \***SLIGO (H28)**: River Easky near Patch (G4032), 2♂♂♀ 24 August 1992, JPOC; Coolaney (G6025), stream, 2♂♂ 29 August 1992, JPOC. **SOUTH KERRY (H1)**: Tomies Wood (V9188), stream, Killarney, ♂ 15 September 1981, JPOC. **WATERFORD (H6)**: Glasha River (S3022), ♂♂♀♀ 8 July 1989, JPOC and MAOC. **WEST MAYO (H27)**: River Moy (G2418), Ballina, 3♂♂ 24 August 1992, JPOC. **WICKLOW (H20)**: Coolattin Woods (T0169), stream, ♀ 14 September 1984, JPOC; Powerscourt Waterfall (O2012), ♂ 31 July 1986, JPOC and MAOC; Devil's Glen (T2399), streams, 4♂♂2♀♀ 7 August 1990, JPOC and MAOC.

#### *Leuctra hippopus* Kempny, 1899 (Fig. 2)

\***CARLOW (H13)**: Altamont Gardens (S8666), stream, ♂ 15 April 1990, JPOC, also ♀ 31 March 1991, JPOC. \***CAVAN (H30)**: Dún an Rí Forest Park (N8197), streams, 9♂♂2♀♀ 11 June 1996, JPOC, also 13♀♀ 6 June 1996, JPOC. **CLARE (H9)**: Lisdoonvarna Spa (R1398),

stream, ♀ 21 April 1982, JPOC and MAOC; Kilshanny (R1293), in hedgerows beside stream, ♀ 3 June 1992, JPOC. **KILDARE (H19):** Louisa Bridge marsh (N9936), 2♂♂♀ 24 February 1992, JPOC and MAOC, also 5♂♂5♀♀ 10 April 1989, JPOC. **NORTH KERRY (H2):** River Cloghereen near hotel (V9787), ♂♀ 28 May 1995, JPOC, also near Blue Pool (V9887), ♂4♀♀ 28 May 1995, JPOC; river at Galway's Bridge (V9180), Killarney, 3♀♀ 31 May 1995, JPOC. **NORTH TIPPERARY (H10):** stream near Ballina (R7172), ♂2♀♀ 20 May 1985, JPOC and MAOC. **WATERFORD (H6):** Mahon Falls (S3009), ♂ 3 July 1988, JPOC; streams near Carrick-on-Suir (S3621), ♂ July 1989, JPOC and MAOC. **\*WEXFORD (H12):** Oaklands Wood (S7125), stream, ♂ 7 June 1986, JPOC and MAOC, also ♂ 12 June 1990, JPOC; also ♀ 20 April 1990, JPOC and MAOC; Killoughrim Forest (S8941), stream, ♀ 4 April 1986, JPOC and MAOC; Coolbawn House (S8337), stream, 2♂♂ 19 April 1992, JPOC; Tintern Abbey (S7810), small river, ♂ 28 March 1989, JPOC. **WICKLOW (H20):** Devil's Glen (T2399), streams, ♂ 17 March 1988, JPOC and MAOC; Mount Usher Gardens (T2796), Ashford, ♀ 27 May 1991, JPOC and MAOC; Knocksink Wood (O2117), streams, ♀ 15 May 1991, JPOC; Glendalough National Park (T1195), stream, ♀ 24 April 1989, JPOC and MAOC, also ♂ 21 May 1989, JPOC.

***Leuctra inermis* Kempny, 1899 (Fig. 3)**

**\*CAVAN (H30):** Dún an Rí Forest Park (N8197), streams, 6♀♀ 11 June 1996, JPOC, also ♀ 6 June 1996, JPOC. **NORTH KERRY (H2):** Torc Stream (V9684), Killarney, ♂2♀♀ 30 May 1995, JPOC; river at Galway's Bridge (V9180), Killarney, ♂ 31 May 1995, JPOC. **WATERFORD (H6):** Mahon Falls (S3009), ♂5♀♀ 20 June 1991, JPOC and MAOC, also ♂♀ 3 July 1988, JPOC; Glasha River (S3022), ♀ 8 July 1989, JPOC and MAOC; streams near Carrick-on-Suir (S3621), ♂♀, July 1989, JPOC and MAOC. **\*WEXFORD (H12):** Oaklands Wood (S7125), stream, 2♂♂♀ 7 June 1986, JPOC and MAOC, also ♀ 12 June 1990, JPOC. **WICKLOW (H20):** stream near Lackan (N9911), ♂ 31 July 1986, JPOC; Powerscourt Waterfall (O2012), 2♂♂♀ 15 June 1988, JPOC.

## NEMOURIDAE

### *Amphinemura sulcicollis* (Stephens, 1836) (Fig. 4)

\***CAVAN (H30)**: Dún an Rí Forest Park (N8197), streams, ♂8♀♀ 11 June 1986, 2♀♀ 13 June 1996, JPOC; river in Deerpark (Virginia) Woods (N5987), 3♀♀ 4 June 1990, JPOC and MAOC. \***CLARE (H9)**: green road near Formoyle (M1606), ♂ 29 May 1992, JPOC and MAOC. **NORTH KERRY (H2)**: Torc Stream (V9684), Killarney, 2♂♂♀, 30 May 1995, JPOC; river at Galway's Bridge (V9180), Killarney, 3♀♀ 31 May 1995, JPOC. **NORTH TIPPERARY (H10)**: stream near Ballina (R7172), 7♂♂7♀♀ 20 May 1985, JPOC and MAOC. **WATERFORD (H6)**: Mahon Falls (S3009), 3♂♂5♀♀ 20 June 1991, JPOC and MAOC, also ♀ 3 July 1988, JPOC; Glasha River (S3022), ♂ 8 July 1989, JPOC and MAOC. **WICKLOW (H20)**: Powerscourt Waterfall (O2012), ♂♀ 31 July 1986, JPOC and MAOC, also ♂ 15 June 1988, JPOC; Avondale Forest Park (T1985), Avonmore River, 6♂♂4♀♀ 27 May 1988, JPOC.

### *Protonemura meyeri* (Pictet, 1841) (Fig. 5)

\***CLARE (H9)**: Lisdoonvarna Spa (R1398), stream, ♂2♀♀ 21 April 1982, JPOC and MAOC. **KILDARE (H19)**: Pollardstown (Newbridge) Fen/Grand Canal (N7616), ♀ 30 April 1987, JPOC. \***KILKENNY (H11)**: Woodstock Estate (S6337), Inistioge, ♀ 2 April 1988, JPOC. **NORTH KERRY (H2)**: Cloghereen Wood (V9886), stream, ♀ 28 May 1995, JPOC; Torc Stream (V9684), Killarney, ♀ 30 May 1995, JPOC; River Cloghereen (V9887), near Blue Pool, ♀ 28 May 1995, JPOC.

### *Nemoura avicularis* Morton, 1894 (Fig. 6)

\***KILDARE (H19)**: Pollardstown (Newbridge) Fen/Grand Canal (N7616), ♂4♀♀ 30 April 1987, JPOC.

### *Nemoura cinerea* (Retzius, 1783) (Fig. 7)

\***CARLOW (H13)**: Bahana Woods (S7239), ♂♀ 14 June 1991, JPOC and MAOC. **CAVAN**

**(H30):** Lough Ramor, Deerpark (Virginia) Woods (N5987), ♀ 4 June 1990, JPOC; also 3♂♂2♀♀ 21 May 1989, JPOC and MAOC. **CLARE (H9):** Lough Bunny (R3796), 13♂♂2♀♀ 21 May 1985, JPOC and MAOC, also 3♂♂ 28 May 1992, JPOC; Kilshanny (R1293), in hedgerows beside stream, ♂ 3 June 1992, JPOC; Rathborne River (M2004), ♀ 2 June 1992, JPOC. **\*LIMERICK (H8):** Lough Gur (R6440), ♀ 7 July 1981, JPOC. **NORTH KERRY (H2):** River Laune at Beaufort Bridge (V8892), 4♂♂2♀♀ 26 May 1995, JPOC. **\*OFFALY (H18):** Tullamore (Charleville Wood) (N3122), 6♂♂3♀♀ 28 April 1987, JPOC. **\*WATERFORD (H6):** Mahon Falls (S3009), ♀ 20 June 1991, JPOC and MAOC; Belle Lake (S6605), ♂ 11 June 1991, JPOC; Ballin Lough (S4403), 3♀♀ 18 June 1990, JPOC and MAOC; streams near Carrick-on-Suir (S3621), ♀ July 1989, JPOC and MAOC. **WEST CORK (H3):** Glengarriff Forest Park (V9057), ♀ 6 July 1985, JPOC and MAOC. **WESTMEATH (H23):** Ballynafid Lough (N4160), 6♂♂3♀♀ 5 May 1987, JPOC; also ♂ 22 June 1989, JPOC. **\*WEXFORD (H12):** Coolbawn House (S8337), stream, ♀ 19 April 1992, JPOC; Killoughrim Wood (S8941), stream, 3♂♂♀ 19 April 1990, JPOC and MAOC; Oaklands Wood (S7125), stream, 2♂♂ 7 June 1986, JPOC and MAOC. **WICKLOW (H20):** Glendalough (T1195), stream, ♂ 24 April 1989, JPOC and MAOC; also ♂ 21 May 1989, JPOC; area near Powerscourt Waterfall (O2012), ♀, 15 June 1988, JPOC.

***Nemurella picteti* Klapálek, 1900 (Fig. 8)**

**\*CAVAN (H30):** river in Deerpark (Virginia) Woods (N5987), 2♂♂♀ 15 May 1989, JPOC; Dún an Rí Forest Park (N8197), streams, ♀ 13 June 1996, JPOC. **KILDARE (H19):** Pollardstown (Newbridge) Fen/Grand Canal (N7616), 2♂♂♀, 30 April 1987, JPOC; Louisa Bridge marsh (N9936), ♂ 10 April 1989, JPOC. **\*NORTH KERRY (H2):** Kenmare Estate including Deenagh River (V9590), Killarney, 2♀♀ 8 September 1981, JPOC; river at Galway's Bridge (V9180), Killarney, ♂ 31 May 1995, JPOC. **\*\*WEXFORD (H12):** Oaklands Wood (S7125), stream, ♂♀ 7 June 1986, JPOC and MAOC; also ♂2♀♀ 29 May 1987, JPOC; Killoughrim Forest (S8941), stream, ♀ 4 April 1986, JPOC and MAOC; National Heritage

Centre, Ferrycarrig (T0022), marshy area, 2♀♀ 2 June 1986, JPOC also ♂2♀♀ 3 June 1986, JPOC and MAOC; Coolbawn House (S8337), stream, ♂♀ 19 April 1992, JPOC; J. F. Kennedy Park (S7319), streams and pond, ♂ 20 August 1996, JPOC. **WICKLOW (H20):** Russborough House (N9510), lake, ♂♂♀♀ 16 April 1982, JPOC and MAOC; Lower Calary marsh (O2311), ♂ 23 September 1989, JPOC and MAOC; Devil's Glen (T2399), streams, ♂, 17 March 1988, JPOC and MAOC; Knocksink Wood (O2117), streams, ♂3♀♀ 15 May 1991, JPOC; Glendalough (T1195), stream, 2♂♂2♀♀ 24 April 1989, JPOC and MAOC, also ♀ 21 May 1989, JPOC.

### TAENIOPTERYGIDAE

#### *Brachyptera risi* (Morton, 1896) (Fig. 9)

\***CARLOW (H13):** Bahana Wood (S7239), ♀ 14 June 1991, JPOC and MAOC; Altamont Gardens (S8666), stream, 2♂♂ 31 March 1991, JPOC. \***KILDARE (H19):** Carton Estate (N9638), ♀ 30 April 1987, JPOC; Louisa Bridge marsh (N9936), 2♂♂♀ 10 April 1989, JPOC. **KILKENNY (H11):** Woodstock Estate (S6337), Inistioge, ♂♀ 2 April 1988, JPOC. \***NORTH TIPPERARY (H10):** stream near Ballina (R7172), ♂ 20 May 1985, JPOC and MAOC. \***WEXFORD (H12):** Oaklands Wood (S7125), stream, ♂ 7 June 1986, JPOC and MAOC; also ♀ 29 May 1987, ♀ 12 June 1990, JPOC; Coolbawn House (S8337), stream, ♀ 19 April 1992, JPOC. **WICKLOW (H20):** Glendalough National Park (T1195), stream, ♂♀ 24 April 1989, JPOC and MAOC.

### CHLOROPERLIDAE

#### *Chloroperla tripunctata* (Scopoli, 1763) (Fig. 10)

**NORTH KERRY (H2):** Torc Stream (V9684), Killarney, 8♂♂9♀♀ 30 May 1995, JPOC. **WATERFORD (H6):** Glasha River (S3022), 2♀♀ 8 July 1989, JPOC and MAOC.



***Siphonoperla torrentium* (Pictet, 1841) (Fig. 11)**

**CARLOW (H13):** Altamont Gardens (S8666), stream, 3♀♀ 9 June 1991, JPOC and MAOC. **CLARE (H9):** green road near Formoyle (M1606), Burren, 3♂♂♀ 22 May 1985, ♂ 29 May 1992, JPOC and MAOC; Fanore (M1308), Murroogh River, ♀ 26 May 1992, JPOC. **\*CAVAN (H30):** Dún an Rí Forest Park (N8197), streams, 2♂♂10♀♀ 11 June 1996, JPOC also ♂3♀♀ 6 June 1996, JPOC; river in Deerpark (Virginia) Woods (N5987), ♂ 15 May 1989, JPOC; also 2♀♀ 13 June 1996, JPOC. **NORTH KERRY (H2):** Torc Stream (V9684), Killarney, 2♂♂ 30 May 1995, JPOC; River Deenagh (V9590), Killarney, 2♂♂♀ 1 June 1996, JPOC. **NORTH TIPPERARY (H10):** stream near Ballina (R7172), 4♂♂2♀♀ 20 May 1985, JPOC and MAOC. **WATERFORD (H6):** Mahon Falls (S3009), ♂3♀♀ 20 June 1991, JPOC and MAOC; also 2♀♀ 3 July 1988, JPOC; streams near Carrick-on-Suir (S3621), 2♂♂3♀♀ July 1989, JPOC and MAOC. **WEST CORK (H3):** Glengarriff Forest Park (V9057), 2♂♂♀ 4 July 1985, JPOC. **\*\*WESTMEATH (H23):** stream leaving Lough Derravaragh (N4763), ♀ 30 May 1990, JPOC. **WEXFORD (H12):** Oaklands Wood (S7125), stream, ♀ 7 June 1986, JPOC and MAOC, also ♀ 18 June 1982, JPOC and MAOC, also ♂♀ 12 June 1990, JPOC; Kiltaly (S8645), ♀ 9 June 1991, JPOC and MAOC; Tintern Abbey (S7810), small river, 2♀♀ 6 July 1990, JPOC. **WICKLOW (H20):** Avondale Forest Park (T1985), Avonmore River, ♂3♀♀ 27 May 1988, JPOC; Mount Usher Gardens (T2796), ♂ 27 May 1991, JPOC and MAOC; Powerscourt Waterfall (O2012), ♂♀ 15 June 1988, JPOC.

**PERLODIDAE**

***Isoperla grammatica* (Poda, 1761) (Fig. 12)**

**\*\*CAVAN (H30):** river in Deerpark (Virginia) Woods (N5987), ♂2♀♀ 15 May 1989, JPOC; Dún an Rí Forest Park (N8197), streams, ♀ 6 June 1996, JPOC. **CLARE (H9):** Fanore (M1308), Murroogh River, 3♀♀ 26 May 1992, JPOC. **\*LEITRIM (H29):** river leaving lower end of Lough Melvin (G9249), ♀ 7 August 1989, JPOC. **NORTH KERRY (H2):** River Laune (V8892), Beaufort Bridge, ♀ 26 May 1995, JPOC. **SOUTH TIPPERARY (H7):** River Suir

(S0423), near Swiss Cottage, 2♀♀ 12 July 1990, JPOC. **WEST CORK (H3)**: Glengarriff Forest Park (V9057), ♀ 12 July 1985, JPOC. **WEXFORD (H12)**: river near Fethard (S7806), ♂ 10 June 1990, JPOC and Stephen Rigney; Tintern Abbey (S7810), small river, ♀ 6 July 1990, JPOC. **WICKLOW (H20)**: Avondale Forest Park (T1985), Avonmore River, ♂2♀♀, 27 May 1988, JPOC; Knocksink Wood (O2117), streams, ♀ 15 May 1991, JPOC; Devil's Glen (T2399), streams, ♂ 7 August 1990, JPOC and MAOC.

### **Acknowledgements**

The authors wish to thank Dr M. J. Costello for his advice on the correct identification of some specimens. They are also grateful to Kevin O'Connor and Stephen Rigney for help with field-work. The maps were prepared using DMAP.

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FIGURE 1. Records of *Leuctra fusca* (Linnaeus).

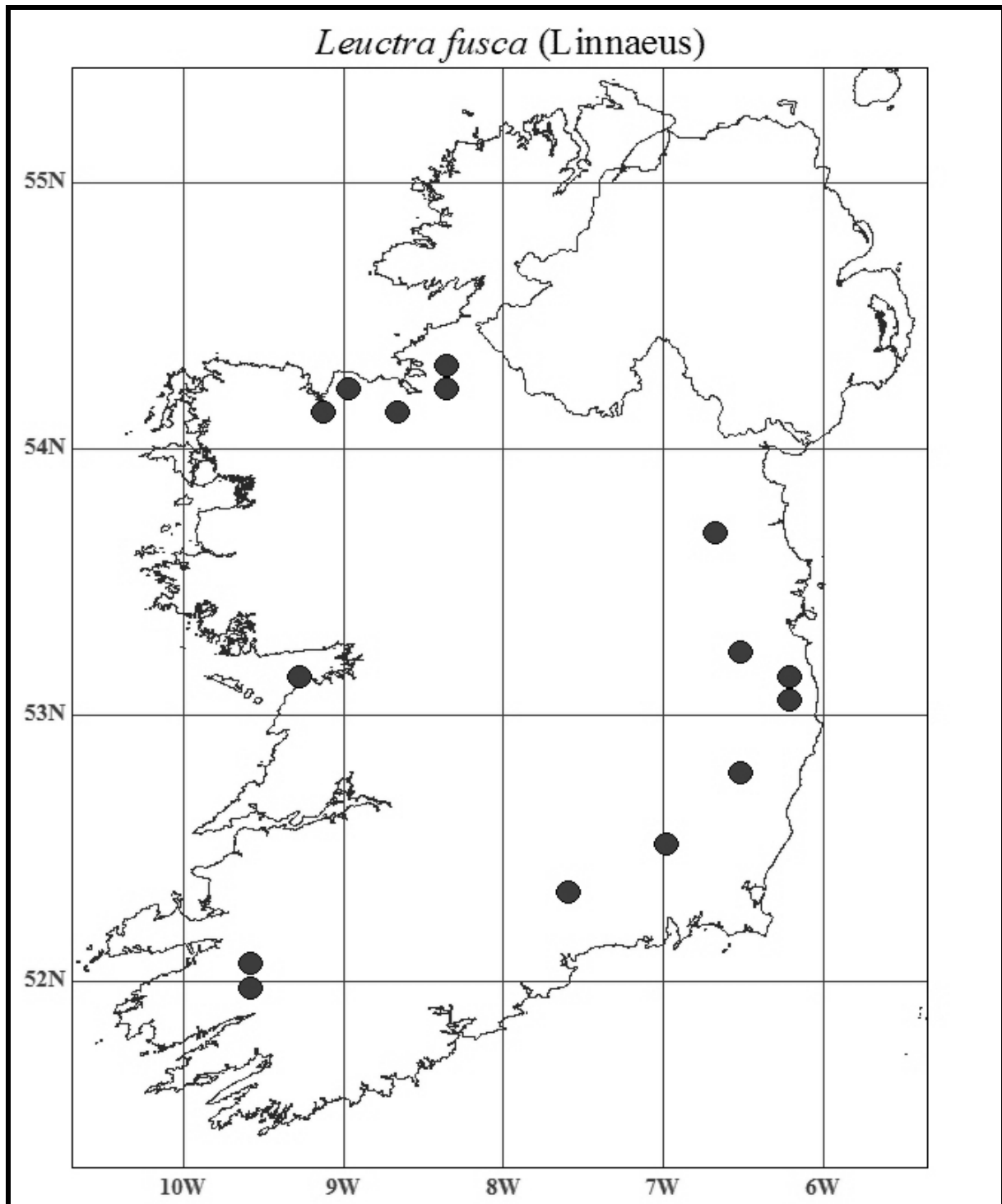


FIGURE 2. Records of *Leuctra hippopus* Kempny.

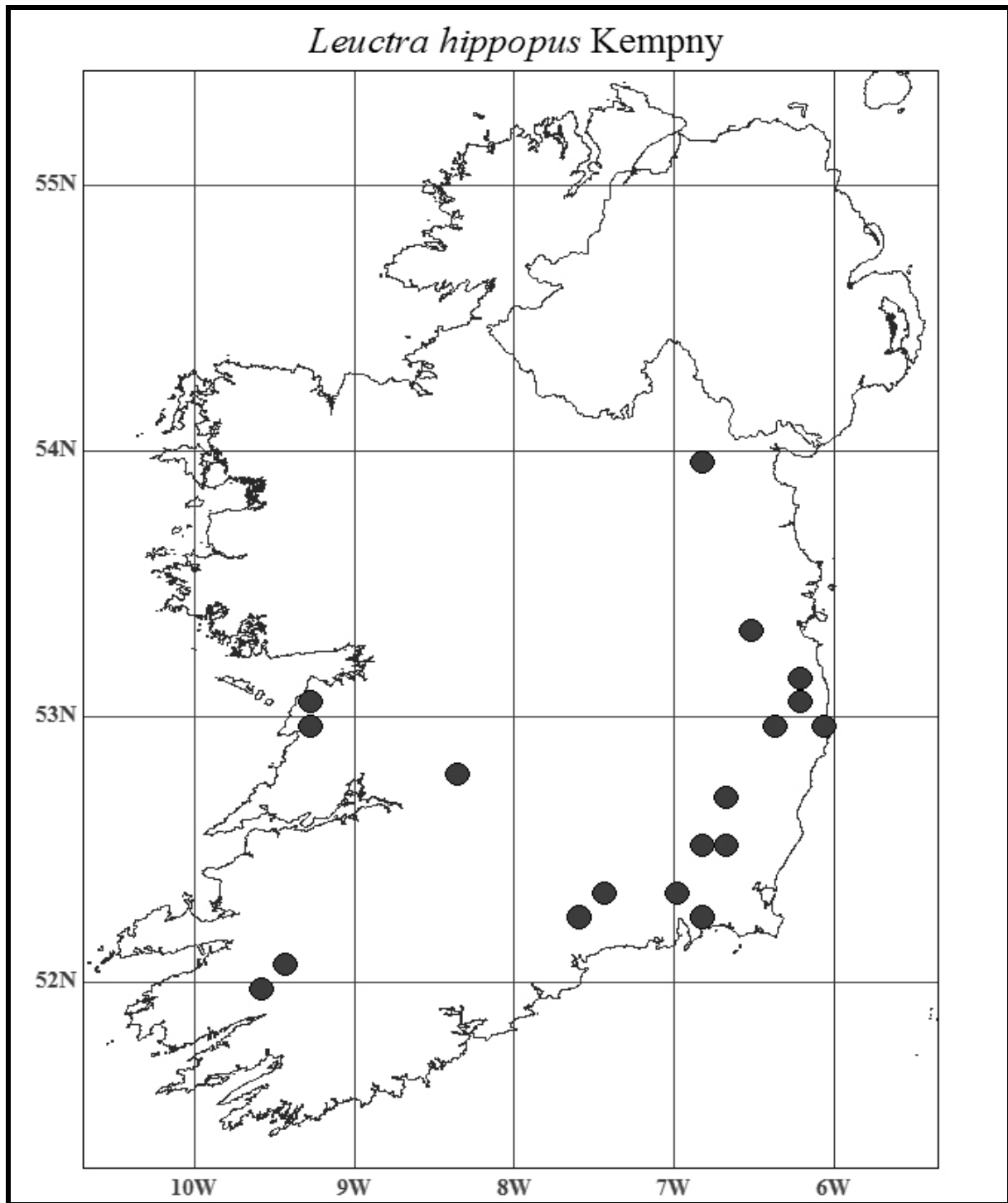


FIGURE 3. Records of *Leuctra inermis* Kempny.

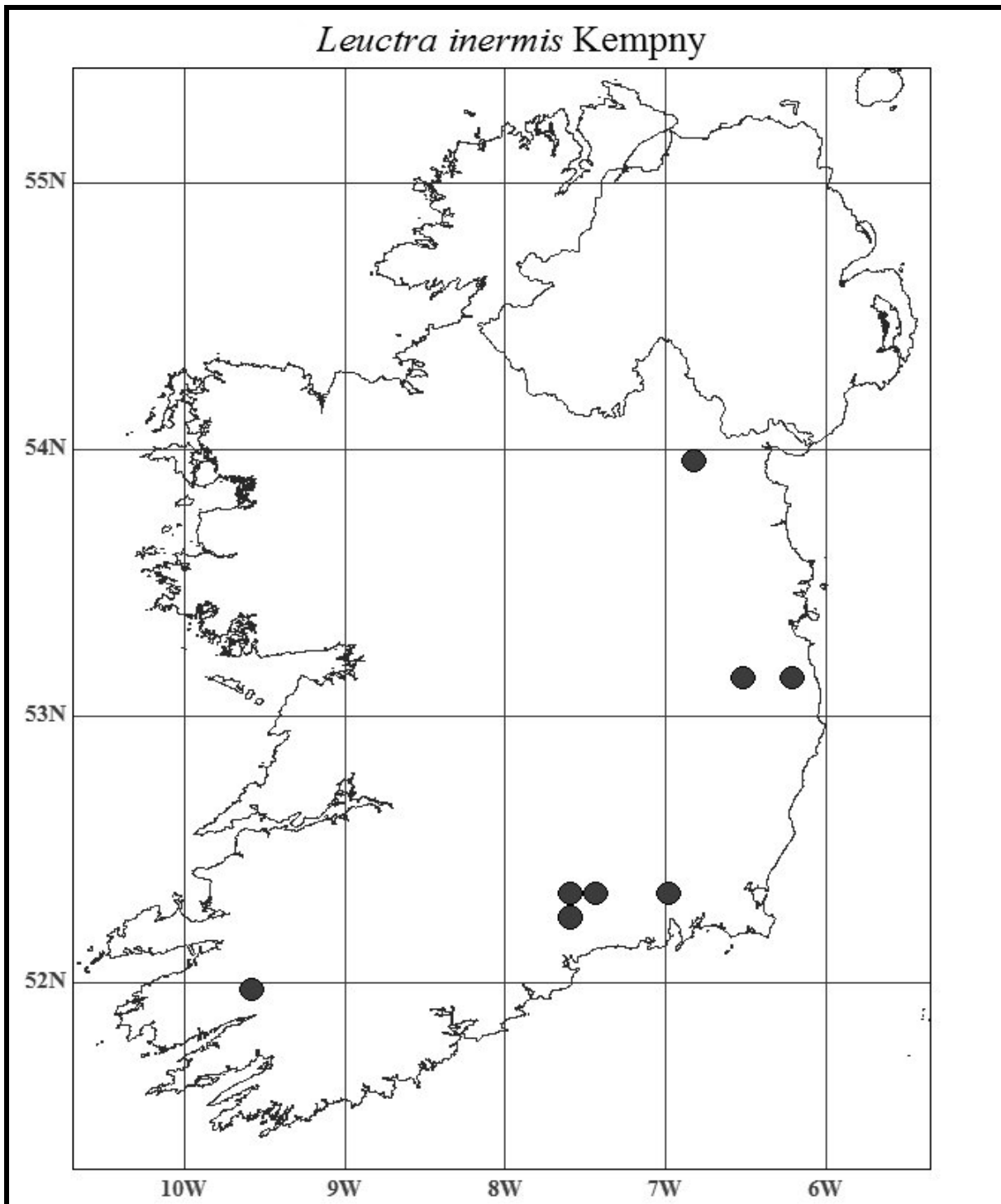


FIGURE 4. Records of *Amphinemura sulcicollis* (Stephens).

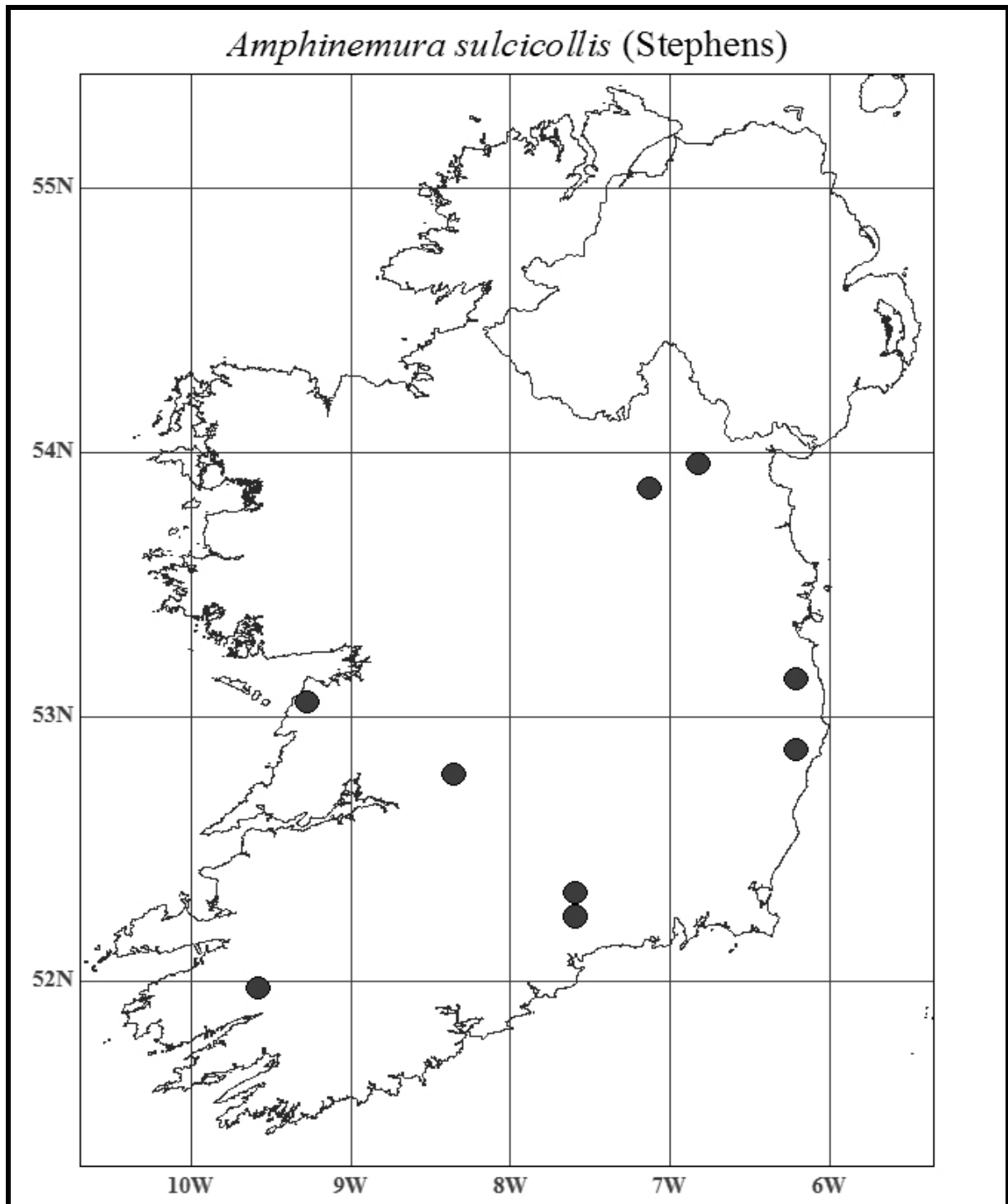


FIGURE 5. Records of *Protonemura meyeri* (Pictet).

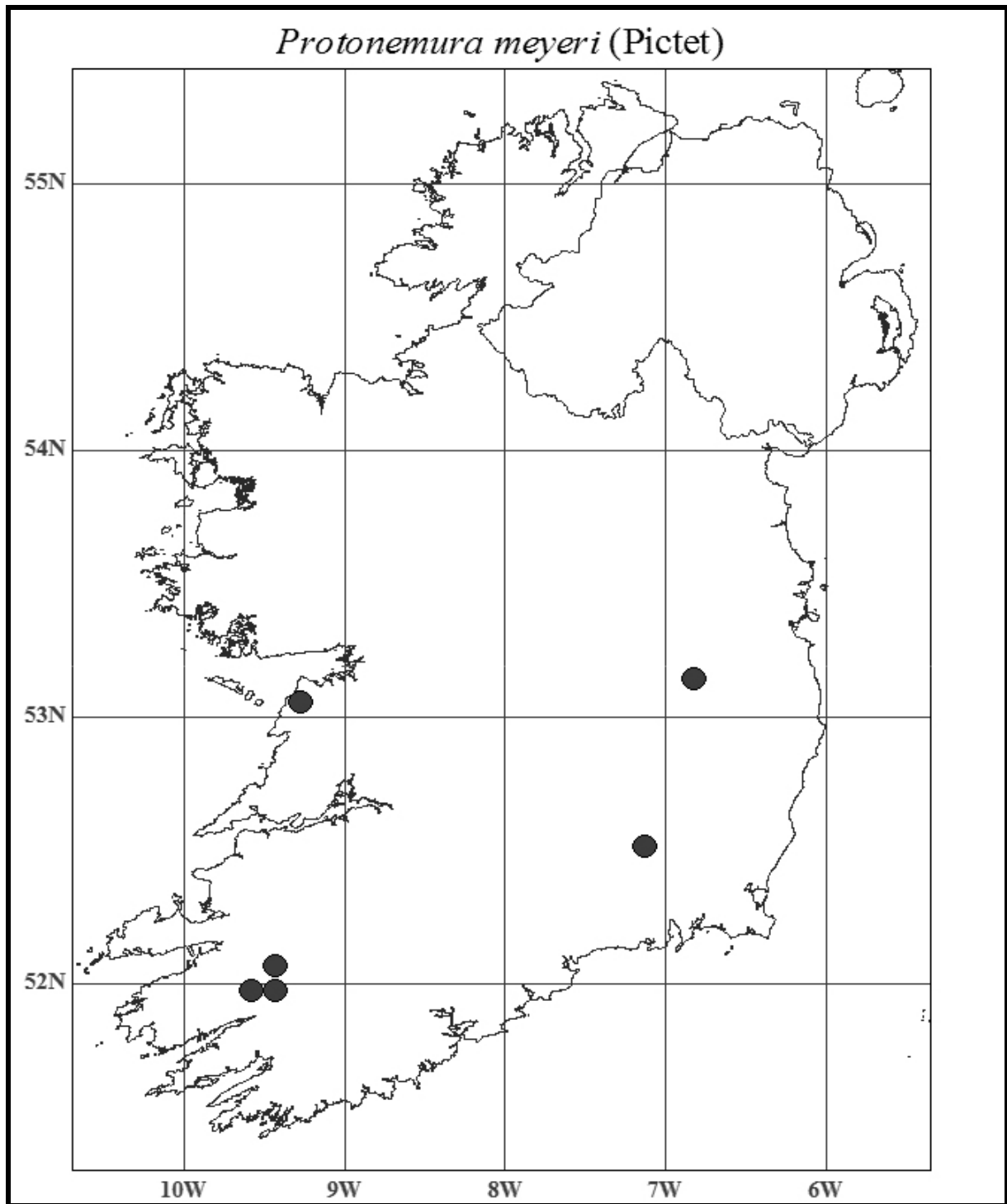




FIGURE 6. Record of *Nemoura avicularis* Morton.

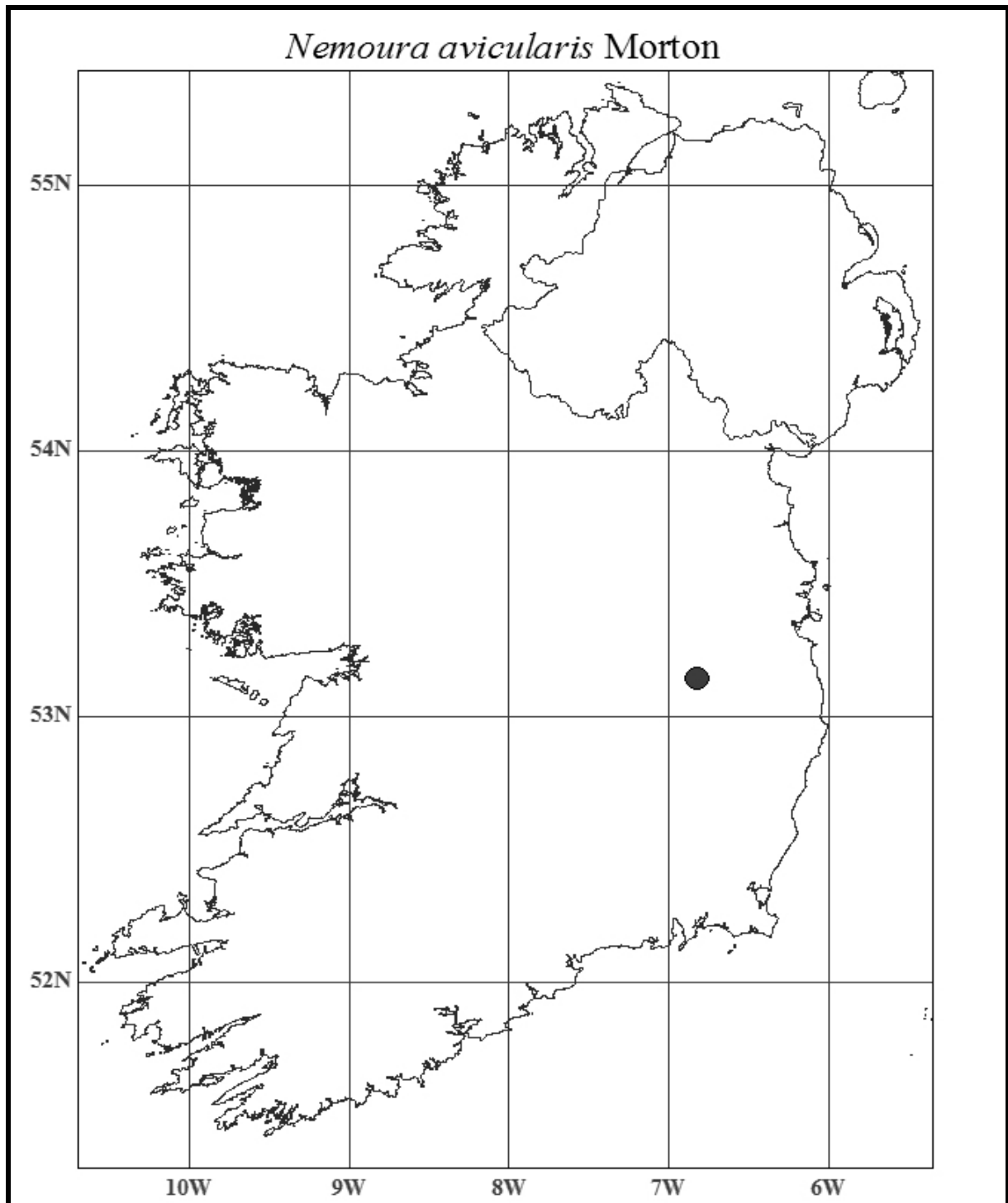


FIGURE 7. Records of *Nemoura cinerea* (Retzius).

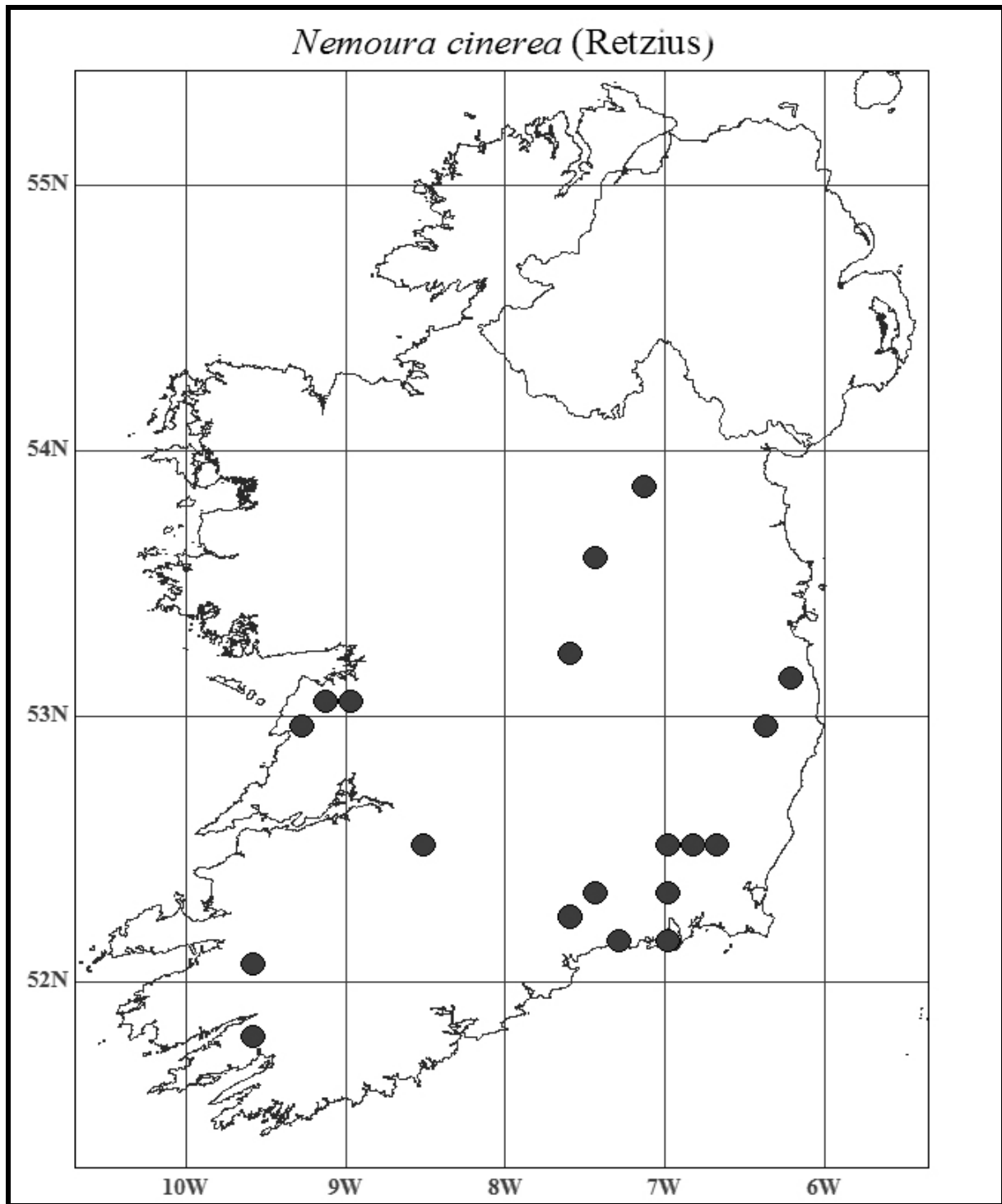


FIGURE 8. Records of *Nemurella picteti* Klapálek.

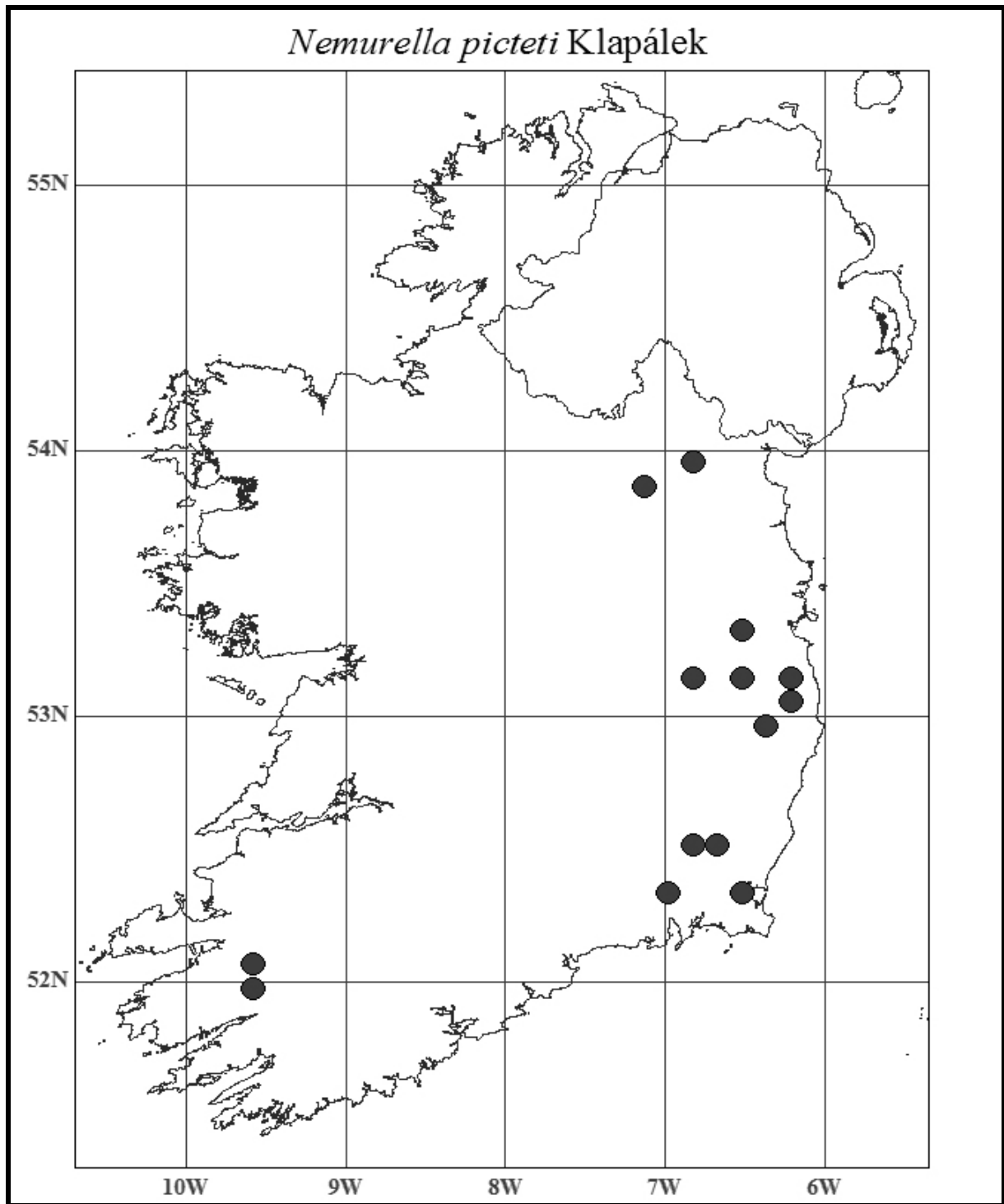


FIGURE 9. Records of *Brachyptera risi* (Morton).

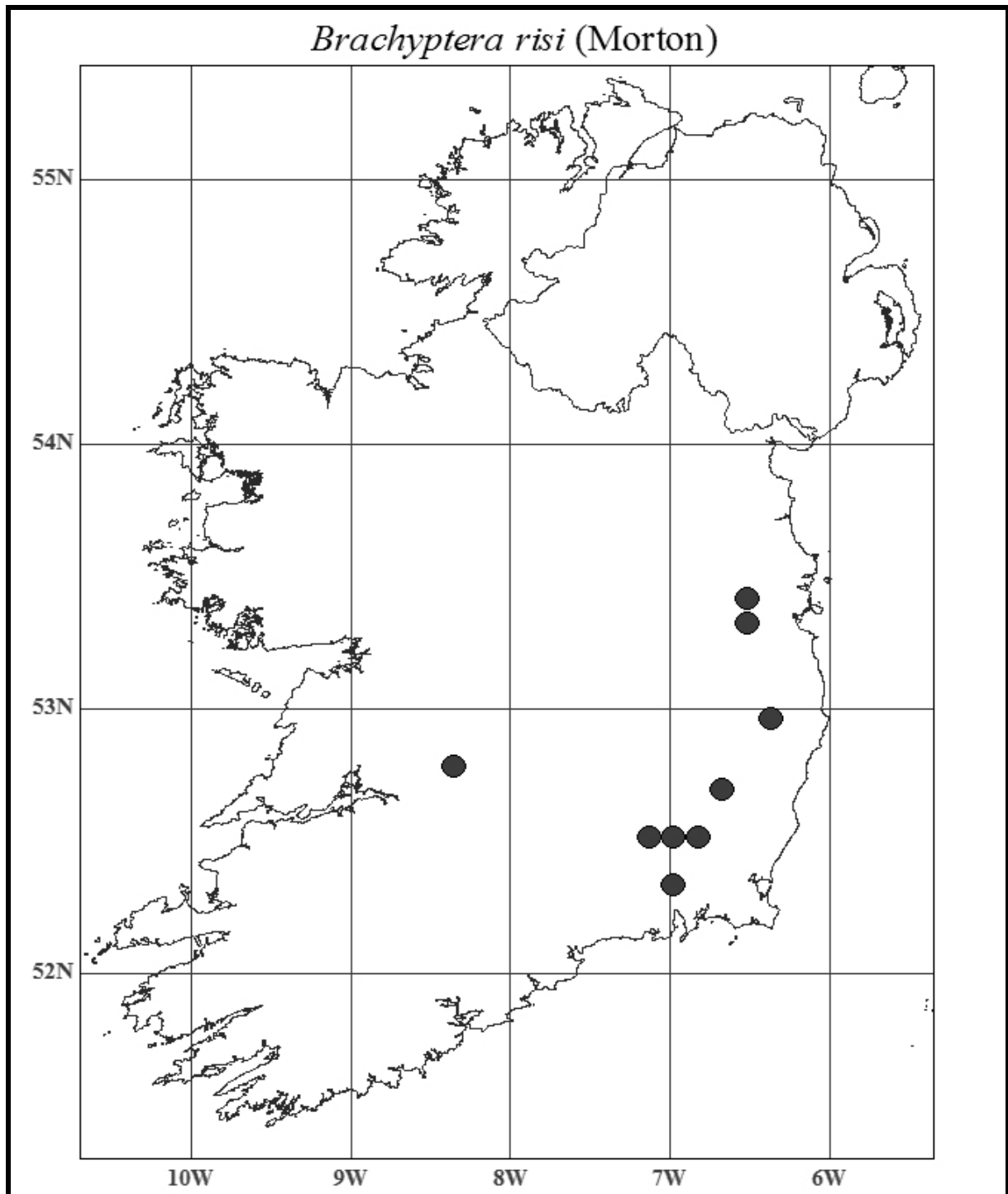


FIGURE 10. Records of *Chloroperla tripunctata* (Scopoli).

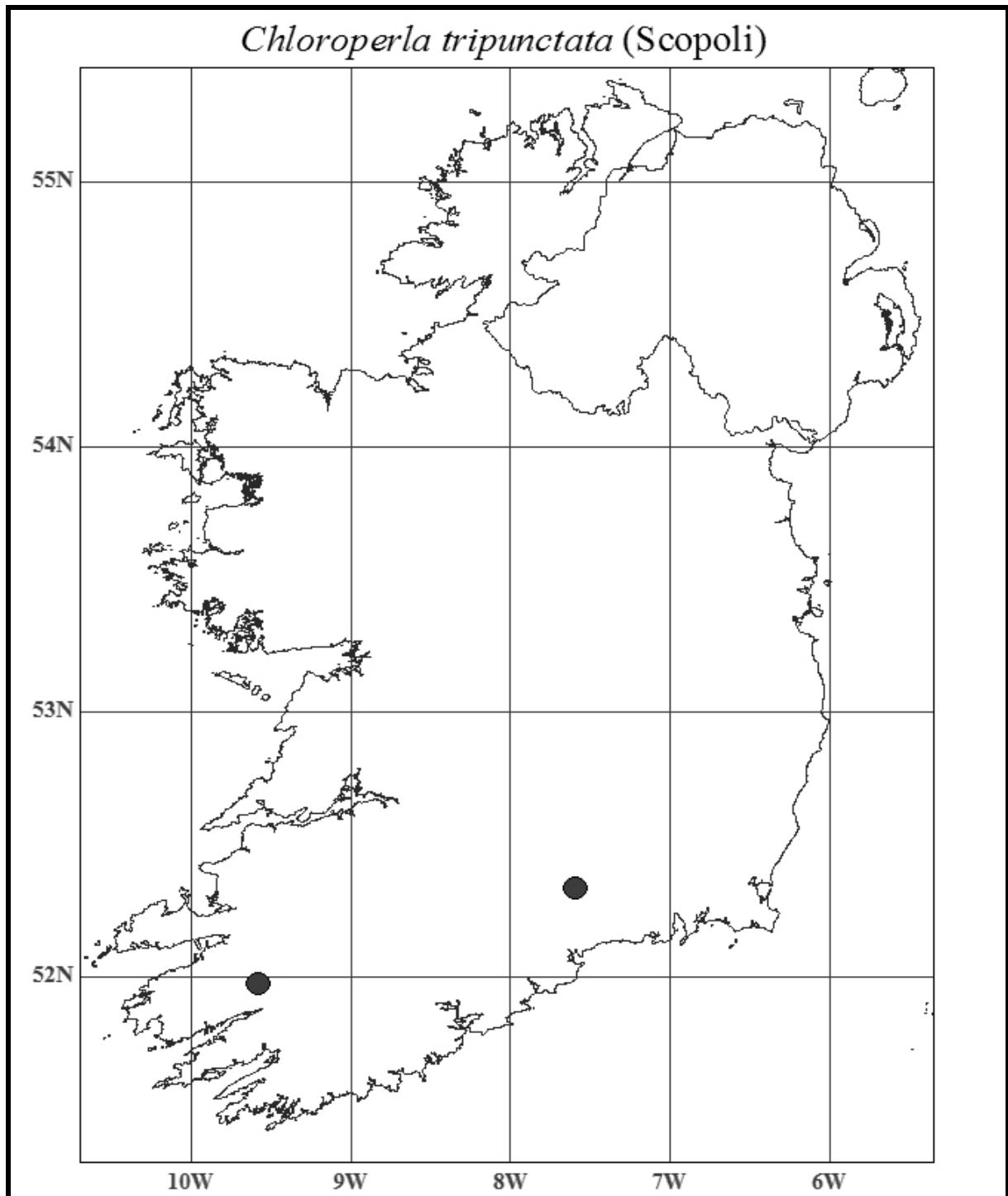


FIGURE 11. Records of *Siphonoperla torrentium* (Pictet).

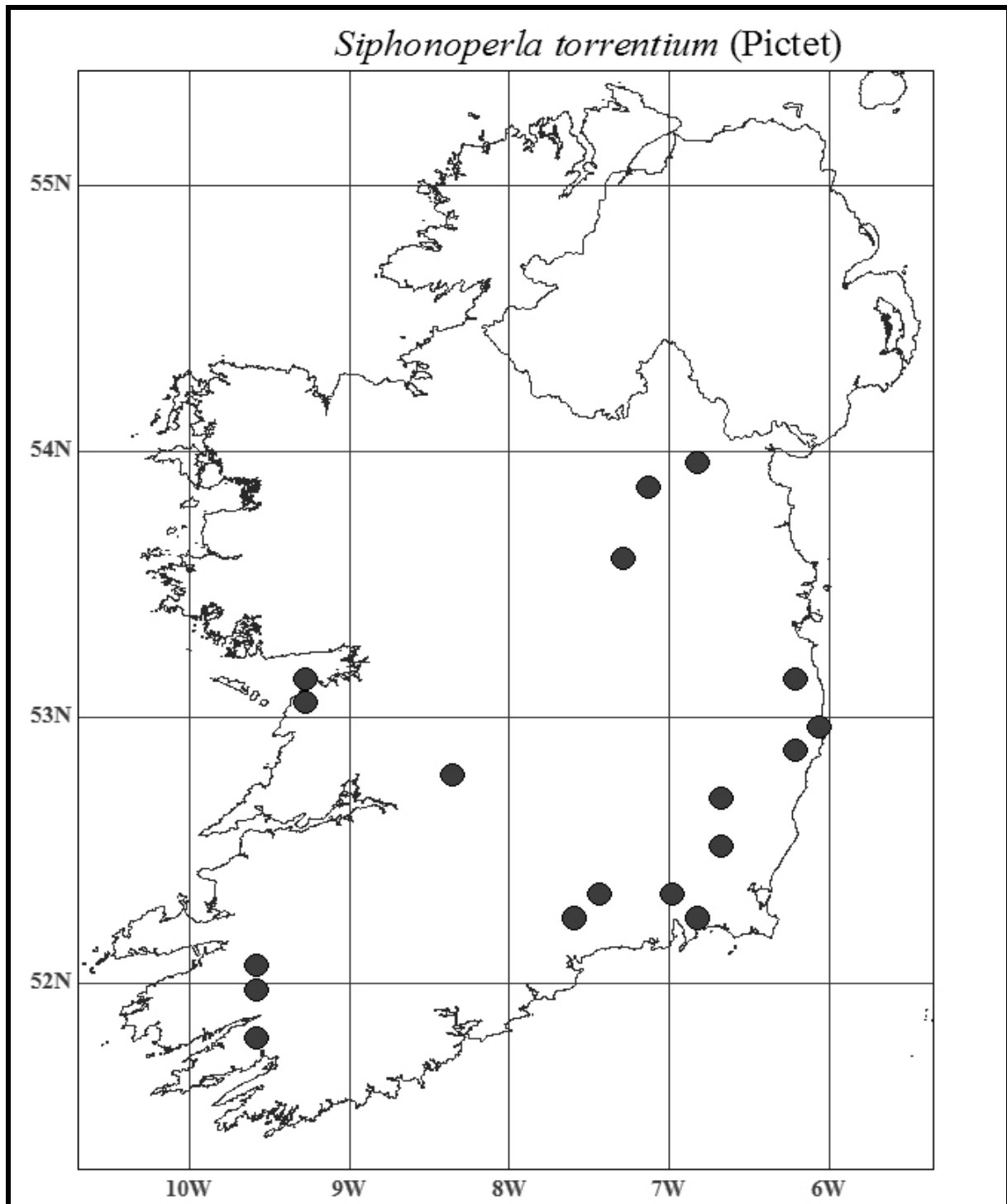
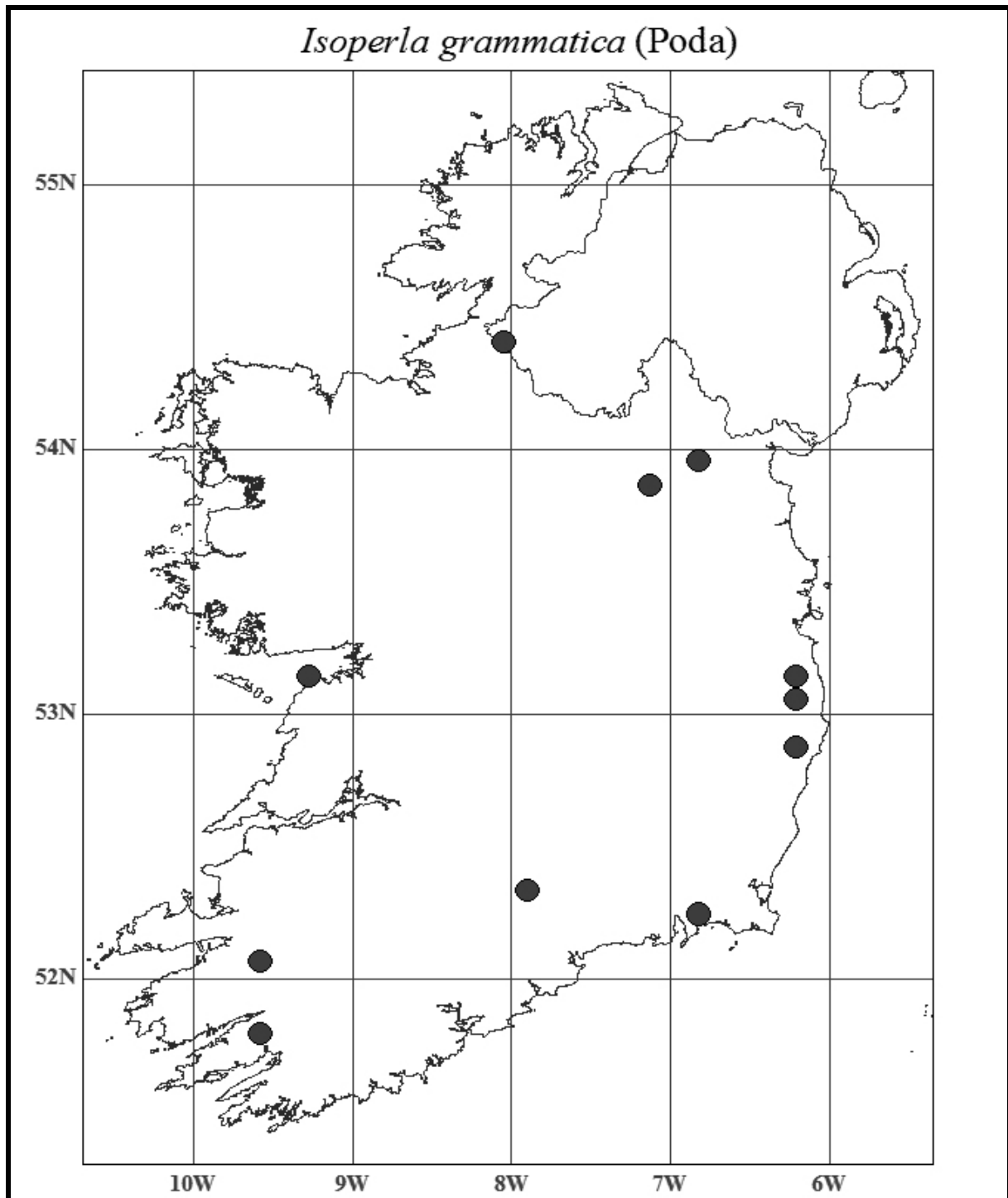


FIGURE 12. Records of *Isoperla grammatica* (Poda).



**TETRAGNATHA STRIATA L. KOCH (ARANEAE: TETRAGNATHIDAE)  
CONFIRMED AS AN IRISH SPECIES**

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**Abstract**

Previous Irish records of the spider *Tetragnatha striata* L. Koch were based on two immature males collected in Cos Galway and Sligo. The discovery of 4♂♂1♀ in Co. Sligo in 2011, confirms *T. striata* as an Irish species.

**Key words:** Araneae, *Tetragnatha striata*, Ireland, confirmation

**Introduction**

*Tetragnatha striata* L. Koch was first reported from Ireland by Pack-Beresford (1909), based on a specimen collected by J. N. Halbert at Ballysadare, Co. Sligo. The only subsequent record concerned a specimen collected by R. A. Phillips at Portumna, Co. Galway reported by Pack-Beresford (1924). In both instances, single immature males were involved. These are the only records listed by Helsdingen (1996) and there have been no more recent finds, despite considerable fieldwork.

**New record of *Tetragnatha striata* L. Koch**

**SLIGO:** Colgagh Lake (G743364), 13 June 2011. Five specimens (4♂♂1♀) of *Tetragnatha striata* were beaten from common club-rush *Schoenoplectus lacustris* (L.) Palla, growing in a few centimetres of water at the edge of a lake. Other spiders present were *Erigone dentipalpis* (Wider) (♂), *Porrhomma pygmaeum* (Blackwall) (1♂3♀♀), *Walckenaeria vigilax* (Blackwall) (♂), *Pachygnatha clercki* Sundevall (1♀), *Tetragnatha extensa* (Linnaeus) (♂), *Larinioides*



*cornutus* (Clerck) (♂), *Pirata piraticus* (Clerck) (♂♀), *Clubiona phragmitis* C. L. Koch (♂♀) and *Clubiona reclusa* O. P. - Cambridge (1♂ 3♀♀).

This new record confirms the presence of *T. striata* in Ireland. The species has a scattered distribution in Britain where it has nationally scarce (Notable B) status. However, it is assumed to be under-recorded in that country because of its tendency to be present on vegetation growing in open water (Harvey *et al.*, 2002). There may be also a tendency to occur on vegetation in deep water (Crocker and Daws, 2001). *T. striata* has a very wide European distribution (Helsdingen, 2012).

### **Acknowledgement**

Thanks to Myles Nolan who kindly confirmed my identification and for his advice.

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***HETEROGASTER URTICAE* (FABRICIUS) (HETEROPTERA: LYGAEIDAE)  
CONFIRMED AS AN IRISH SPECIES**

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**Abstract**

The landbug *Heterogaster urticae* (Fabricius) has been discovered at two sites in Co. Wexford, south-east Ireland. This discovery confirms the presence of the species in Ireland.

**Key words:** Heteroptera, *Heterogaster urticae*, Ireland, confirmation

**Introduction**

The heteropteran *Heterogaster urticae* (Fabricius) was listed as Irish by Saunders (1892), based on two specimens of unknown provenance which are in the Haliday collection in the National Museum of Ireland and are mentioned by Halbert (1935) in an addendum to his Irish catalogue. There are no other Irish records for this landbug, despite the fact that it is widespread in southern Britain, and the abundance here of its foodplant, common nettle *Urtica dioica* L. *H. urticae* is treated by O'Connor and Nelson (2012) as a species whose continuing presence in Ireland requires confirmation. This has now been obtained as the authors have independently found the species in Co. Wexford.

**New records of *Heterogaster urticae* (Fabricius)**

**WEXFORD:** Rosslare Burrow (T092171), 9 September 2004. A single specimen of *Heterogaster urticae* was beaten from great mullein *Verbascum thapsus* L. on a road verge,

coll./det. MC. The site was revisited on 25 May 2005 and individuals of *H. urticae* swept from nettle *Urtica dioica* L. along *circa* 2km of road verges, along the western side of the spit which leads to Rosslare Point. Specimens were identified using Southwood and Leston (1959). Ballyduboy (T1839), 27 August 2013. Five specimens of *H. urticae* were taken with a modified garden leaf blower/vacuum from sparsely vegetated, degraded yellow dunes, coll./det. BN. Most specimens were associated with common ragwort *Senecio jacobaea* L., growing on a degraded area of dune habitat. Some small stands of nettle were present among the ragwort but due to active dune restoration, the abundance of nettle has reduced since 2010 (Karen Gaynor, pers. comm.).

The Wexford records confirm the presence of *H. urticae* in Ireland. The species would appear to have a very restricted distribution here, as searches of *Urtica* along the south coast by MC failed to turn up any additional colonies. Likewise BN has sampled many stands of nettle throughout Ireland, while recording Heteroptera, without previously encountering the species. It does appear significant that the new colonies are in the south-east of Ireland and on well-drained habitat which is similar to the description of the habitat in Britain given by Southwood and Leston (1959). These new populations may well represent a new colonisation of Ireland; certainly the habitat occupied at Bullyduhoy was of recent creation. As well as *H. urticae*, the nettle feeding Comma butterfly *Polygona c-album* (L.) has colonised Ireland since 2000 through the south-east (Nash, Boyd and Hardiman, 2012).

### **Acknowledgements**

Dr J. P. O'Connor kindly confirmed the identification of a Rosslare specimen. Specimens have been deposited at the National Museum of Ireland. BN is grateful to the landowner at Bullyduhoy for access to his land.

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*Bulletin of the Irish Biogeographical Society* **No. 37** (2013)

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## **RECORDS OF UNCOMMON GROUND BEETLES (COLEOPTERA: CARABIDAE) FROM NORTH-WEST IRELAND**

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### **Abstract**

Records of twenty eight species of ground beetles (Coleoptera: Carabidae) are given from the north-west of Ireland.

**Key words:** Coleoptera, Carabidae, ground beetles, Ireland, north-west, records

### **Introduction**

In the mid 1990's, the author made some collections of carabids in Co. Sligo, before his natural history interests were diverted into studying other invertebrate groups. Apart from a record for *Carabus nitens* L., which was included in McFerran *et al.* (1996), none of the more interesting finds have made their way into print. These are now detailed below, having recently been re-determined using Luff (2007). More recent finds are also included, as are a few records from the surrounding counties. The carabids of these counties have received little attention from Irish naturalists, however some interesting discoveries were made by Johnson (1902, 1905), notably *Asaphidion pallipes* (Duftschmid), at Rosses Point, Co. Sligo. Upland carabids have been reported on by McCormack *et al.* (2006). *Lebia cruxminor* (L.) has been found at single sites in Cos Sligo and Roscommon (Cawley, 2007, 2009).

### **The records**

#### ***Carabus arvensis* Herbst**

**SLIGO:** Slish Wood (G739315), 13 April 1994, remains of a specimen in moss in mixed

woodland. My only record, and seemingly quite a scarce beetle in these parts.

***Carabus clatratus* L.**

**SLIGO:** Mullaghmore (G6957), 3 April 1995, a single male collected on an exposed coastal headland. This record confirms Mullaghmore as a site for this impressive beetle, as alluded to by McFerran *et al.* (1995). Recorded from Co. Sligo by Johnson and Halbert (1902), however the locality is given as Manorhamilton, so perhaps Co. Leitrim is involved.

***Blethisa multipunctata* (L.)**

**SLIGO:** Cloonacleigha Lake (G6115), 20 June 1993, a singleton present in flood debris. Lough Gowra (G728112), 9 August 2013, two specimens under stones on semi-vegetated lakeshore. The species seems to be associated with the larger lakes and is probably under-recorded in these parts.

***Dyschirius luedersi* Wagner**

**SLIGO:** Colgagh Lake (G744362), 18 July 2013, frequent on recently exposed lakeshore mud.

***Dyschirius politus* (Dejean)**

**SLIGO:** Bunduff Strand (G715563), 6 May 2013, a singleton trapped in a hollow on a coastal sandbank. Re-located in the sand dunes at Bartragh (G262290), 5 June 2013 from where it was also reported by Johnson and Halbert (1902).

***Aepus marinus* (Ström)**

**SLIGO:** Cummeen (G660367), 7 March 1994, under stones embedded in estuarine gravel. Cooanmore Point (G3938), 28 September 2002, a few specimens collected from inter-tidal rock fissures. Drumcliffe (G668422), 30 May 2011, a singleton under a stone on a small patch of inter-tidal shingle.

***Trechus fulvus* Dejean**

**SLIGO:** Cummeen (G6636), 7 January 1993, a few specimens under stones on a clay bank above the estuarine high tide mark. Described as very local in Ireland by Anderson *et al.* (2000).

***Blemus discus* (Fabricius) and *Trechoblemus micros* (Herbst)**

**SLIGO:** singletons of these beetles were collected in an unheated plastic funnel, in a garden

centre at Aghamore (G7132), 8 September 1993. The specimens were possibly introduced at this site which supported various alien invertebrates.

***Cillenus lateralis* Samouelle**

**SLIGO:** Culleenamore (G610340), 28 April 2011. The species was active on damp sand/gravel and also present under stones, a few metres below the high tide mark. **DONEGAL:** Tullan Strand (G833618), 20 April 2013, frequent on bare sand, again well below the high tide mark.

***Bembidion pallidipenne* (Illiger) and *Dyschirius impunctipennis* Dawson**

**SLIGO:** Trawalua Strand (G697548), 26 April 2011. Rosses Point (G627412), 23 May 2012. **DONEGAL:** Tullan Strand (G827603), 20 April 2013. *Bembidion pallidipenne* was frequent at all sites over very restricted areas and present under debris such as dead seaweed, on bare sand at edges of freshwater streams which transverse coastal beaches. *Dyschirius impunctipennis* was also present in small numbers at each site. Both species are clearly widespread in a very restricted habitat. Records from Cos Donegal and Sligo for both species are listed by Johnson (1902), and Johnson and Halbert (1902).

***Bembidion dentellum* (Thunberg)**

**LEITRIM:** Acres Lake (G9609), 8 June 1995, a few specimens were present in a lakeshore marsh. Later, the species was searched for but without success. This site falls within the gap in the Irish distribution alluded to by Anderson *et al.* (2000).

***Bembidion stephensii* Crotch**

**SLIGO:** Donagh (G4435), 10 March 1994. *Bembidion stephensii* occurred under stones on damp soil on a coastal erosion bank. The species is associated with quarries in the north-east of Ireland (Anderson, 1992).

***Bembidion assimile* Gyllenhal**

**SLIGO:** Colgagh Lake (G743364), 13 June 2011, at the base of *Carex* clumps on the lakeshore. Bartragh (G276287), 5 June 2013. The species was frequent in tidal debris in a small area of saltmarsh bordering a creek.

***Bembidion minimum* (Fabricius)**

**SLIGO:** Killaspugbrone (G6136), 19 April 1994. The species was present under a stone in a saltmarsh.

***Bembidion doris* (Panzer)**

**SLIGO:** Colgagh Lake (G743364), 13 June 2011, at the base of *Carex* clumps on the lakeshore.

***Stomis pumicatus* (Panzer)**

**SLIGO:** Strandhill (G6036), 19 April 1994, coastal grassland.

***Poecilus cupreus* (Linnaeus)**

**SLIGO:** Streedagh (G6349), 7 January 1993, coastal grassland. Loughanboy (M6797), 11 May 1993, road through blanket bog. Chaffpooll (G5511), 5 April 2013, a male in moss on limestone grassland.

***Pterostichus anthracinus* (Panzer)**

**LEITRIM:** Lough Scannal (N0491), 28 February 1994, lakeshore scrub.

***Synuchus vivalis* (Illiger)**

**SLIGO:** Mullaghgar (G745356), 30 May 1997, a singleton on calcareous heath.

***Amara familiaris* (Duftschmid)**

**DONEGAL:** Tullan Strand (G827603), 12 June 2013, a singleton on a sandy bank, adjacent to sand dunes.

***Amara tibialis* (Paykull)**

**SLIGO:** Bartragh (G262290), 5 June 2013, frequent in the sand dunes. *Amara aenea* (De Geer) is the common sand dune species of *Amara* in Co. Sligo.

***Harpalus affinis* (Schrank)**

**SLIGO:** Kilrusheighter (G4835), 3 August 1994, coastal erosion bank.

***Trichocellus placidus* (Gyllenhal)**

**SLIGO:** Templehouse (G625185), 6 May 2013, a single female in leaf litter in mixed lakeshore woodland. Bellarush Bridge (G769154), 25 May 2013, frequent in grass clumps subject to flooding, on the north shore of Lough Arrow. A Co. Leitrim record is listed by Halbert (1937).



***Bradycellus ruficollis* (Stephens)**

**ROSCOMMON:** Bockagh Hill (M602987), 5 March 2013. A few specimens were sieved from mosses on a hilltop blanket bog at *circa* 210m.

***Chlaenius nigricornis* (Fabricius)**

**SLIGO:** Dooney Rock (G721324), 26 April 1994, males and females under stones on the lake shore. Colgagh Lake (G744362), 18 July 2013, a singleton under a stone on the lakeshore.

***Badister sodalis* (Duftschmid)**

**SLIGO:** Cleveragh (G711348), 16 February 1994, under dead bark in a mixed carr woodland along the River Garavogue. **LEITRIM:** Sriff Cottage (G7934), 8 February 1994, under a stone in deciduous woodland along the shore of Lough Gill. Surprisingly, I do not have any more recent records.

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**REASSESSMENT OF EARLY NINETEENTH CENTURY COLEOPTERA RECORDS FROM IRELAND BASED ON THE JAMES TARDY COLLECTION IN THE DUBLIN UNIVERSITY ZOOLOGICAL MUSEUM**

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**Abstract**

James Tardy (1782-1835) assiduously collected insects in eastern Ireland in the early decades of the nineteenth century. Six drawers of Tardy Coleoptera (454 species) remain in the Dublin University Zoological Museum (DUZM), and further specimens are in the National Museum of Ireland (NMI). Records of 60 species uniquely or rarely recorded in Ireland, based on Tardy specimens marked Irish and listed in A. H. Haliday's MS list of Irish insects (1838-1850s) are reviewed. If they were all valid, the Tardy records based on the uninvestigated names in his collection and in Haliday's MS list would indicate a significant loss of biodiversity in eastern Ireland during the nineteenth century. However, after synonyms, misidentifications and probable errors are removed, most of the unique Irish Tardy records *cannot* be accepted with certainty. Nevertheless, including accepted records and allowing for the probability of some excluded records, the collection indicates a likely loss of 1% of beetle biodiversity in eastern Ireland during the 19<sup>th</sup> century. The Tardy collection is also of historical value as the first substantial Coleoptera collection in Ireland.

**Key words:** James Tardy, Irish Coleoptera, biodiversity loss, early nineteenth century museum collections, oak canopy fauna

**Introduction**

James Tardy assiduously collected Coleoptera and other insects in eastern Ireland sometime

between 1800 and 1832, and his Coleoptera collection is held in Dublin University Zoological Museum (DUZM), with some specimens having been transferred to the National Museum of Ireland (NMI) in 1901 (Good and Linnie, 1990). It is the only remaining substantial Irish Coleoptera collection from the period. Reading through the names of specimens marked Irish in his collection (454 species), allowing for synonymy, raises a surprising number of species not currently regarded as Irish. From an ecological perspective, this may indicate a significant loss of biodiversity during the nineteenth century. For this reason, in addition to its intrinsic interest, the collection was considered worth detailed re-examination.

Many Tardy records have been referred to as dubious in the entomological literature, giving the impression that Tardy records are generally unreliable. However, an understanding of Alexander Haliday's MS *Catalogue of Irish insects* (held in the NMI), and its reference to species which were present in the Tardy Collection but which were either misdetermined (name incorrect) or not Irish (locality incorrect), has not been used systematically. An example is the elaterid *Ctenicera pectinicornis* (Linnaeus), which Haliday marked as "name incorrect" in his MS list, but which Stelfox (1947) referred to as an unsubstantiated record rather than a misidentification.

According to Good and Linnie (1990), records based on his collection were considered potentially valid if represented by a correctly-determined specimen marked with green-wax, and if the species was annotated as 'certainly Irish' in Haliday's MS list. Haliday rearranged the Tardy Coleoptera collection between 1847 and the 1850s (see Appendix 1), using now lost Tardy manuscripts (Haliday in Thompson, 1844; Ball, 1847). However, there are anomalies in both specimens marked Irish and with Haliday's MS list (Good, 2013), so each species record must be considered critically on a case-by-case basis.

## **Methods**

The Tardy Coleoptera collection was laid out according to Curtis (1837) nomenclature by Thomas Coulter, and revised by A. H. Haliday (see Appendix 1); it remains virtually unchanged

to the present day. The collection is arranged with the labels above the specimens, the opposite to modern practice. Specimens of Irish provenance are indicated by green wax on their pin-heads (see O'Connor and Nash, 1982), and a green paper disc beside the specimen. However, a number of Tardy collection specimens were transferred to the National Museum of Ireland (NMI) in 1901. These are identifiable in the NMI National collection by the labels "Ireland" (which was attached for green wax-marked specimens after remounting and discarding the pin) and "T.C. Coll. 262.1901", meaning 'Trinity College collection, accession number 262 of 1901'. All specimens labelled like this are referred to as Tardy NMI specimens in the text below.

The 454 species names, represented by specimens marked with green wax on their pin-heads and/or with a green paper disc beside the specimen (i.e. indicating Irish provenance), were listed in a revised MS Catalogue in 2013, with their modern names in a corresponding column, insofar as synonyms could be reliably determined. A copy of this catalogue (*Revised and annotated catalogue of Irish Coleoptera in the Tardy Collection (Dublin University Zoological Museum)*) can be obtained from the author, or from the DUZM (Trinity College, Dublin). This resulted in 417 species which could be ascribed a modern name.

Of these, there are 24 species in the Tardy collection recorded as certainly Irish in Haliday's MS list and represented by a specimen marked Irish but which are not annotated 'ta' (meaning Tardy) or "z" (meaning "common or in many collections") in the MS list. Most of these are annotated 'ha' [= Haliday], so presumably Haliday did not refer to a Tardy record if he had himself already recorded it as Irish, even though in three cases (e.g. *Othius punctulatus* (Goeze) (as *Xantholinus fulgidus* Pk.)) the Haliday record was marked "name incorrect" and the Tardy specimen apparently overlooked. Of the remaining ten species, three appear to be absent from the list, two have no annotation, three do not mention any collector, and one (*Hister 12-striatus*) only refers to Furlong. These 10 are subtracted from the 417 species, giving 407 species.

All 407 species were checked as to their recorded occurrence in eastern Ireland, as Tardy is known to have collected in Dublin, Wicklow, Kildare and Wexford, and also to have at least

received specimens from, if not collected himself, near Belfast (Good and Linnie, 1990). At least one species in the collection appears to have been sent from another part of Ireland: *Pterostichus aterrimus* from Cork (by William Clear), so his collection is not completely limited to eastern Ireland, and he may have travelled more widely (by stage coach) than we realise from the meagre records available. Altogether 60 species names, either not recorded subsequently or rare in Ireland, or notable in the interpretation of his collection, were examined in more detail, and these are listed in Table 1 and described below.

In Haliday's MS list of Irish insects (see Appendix 1), several icons are used to indicate species status, and these are explained in one of the initial pages of his list. A cross within a circle means "certainly Irish". A vertical line within a circle means "'name not insect' locality of specimen indigenous", i.e. the identification of the insect is doubted. A horizontal line within a circle means "name investigated, locality doubtful". For the species below, the full text is quoted instead of the icon, for clarity.

The argument against accepting Irish records of some species, which are both represented by specimens marked Irish and annotated as "certainly Irish" in Haliday's MS list, is made elsewhere (Good, 2013). Essentially, closely related species may have been confused and the incorrect species name marked in Tardy's MS (and then recorded in Haliday's MS list), and subsequently English specimens of similar species may have been erroneously marked Irish, and these errors taken together means that Tardy records of species which could be confused with similar species are suspect (see Good, 2013). Records of these species are rejected (see Table 1).

#### *Tardy Curculionidae and Apionidae*

There are 55 named weevils marked Irish (with green wax and green labels) in the DUZM Tardy Collection, and two and a half columns of *Apion* are totally missing from the collection (including labels). (Perhaps most of the *Apion* were removed for determination; they may be in the Walton collection in the London NHM). However, on p. 41 of Haliday's MS list, after the

genus *Otiorhynchus*, there are very few annotations referring to the Tardy Collection. It appears that Haliday was not taxonomically confident in dealing with these families; 12 separate species are also unnamed in the collection. The copy of Curtis (1829) annotated by Haliday has most of the curculionid species marked with “-” rather than “+”, also indicating uncertainty with the records. Yet, despite this, Hogan (1854) listed 12 curculionid species from the neighbourhood of Dublin as being “Taken by Mr. Tardy” on the authority of Haliday and Furlong. According to Nash and O’Connor (2011), Haliday was in the Dublin University Museum during the early 1850s, so it is curious why he did not update his MS list if he had validated these curculionid records for Hogan.

## Results

In total, there are 34 species represented by names with specimens marked Irish in the collection which are annotated as “locality of specimen indigenous, name incorrect” in Haliday’s MS list. In other words, these species are misidentifications. Examples are *Batophila aerata* (Marsham) and *Chrysolina varians* (Schaller) (Chrysomelidae). These species are marked in the 2013 catalogue of the collection.

Notable or unique Irish records, based on names in the DUZM Tardy collection and either in Haliday’s MS list or in Hogan (1854), or of species which provide examples of errors in the interpretation of the collection, are listed alphabetically in Table 1. The categories are:

- (1) Accepted records - native (or adventive) species
- (2) Accepted records - possible importations
- (3) Rejected records - rejected by Haliday
- (4) Rejected records - misidentifications
- (5) Rejected records - English (or exotic) specimens marked as Irish
- (6) Rejected records - misinterpreted species
- (7) Rejected records - probable Haliday list errors
- (8) Rejected records - confused species

(9) Rejected records - unverified specimens

(10) Rejected records - ? marked in error (see argument for rejection in Good (2014)).

Details of the 60 species listed in Table 1 are given alphabetically in the text below.

***Acilius canaliculatus* (Nicolai) (Dytiscidae) - English specimens marked Irish**

Frequent in parts of Ireland (Foster *et al.*, 2009). It is listed in Haliday's MS list as "*canaliculatus* N. [name investigated, locality doubtful] ta!", showing that Haliday did not accept the record as Irish. Similarly, Coulter's copy of Curtis (1837) has the annotation "O ta [= Tardy collection, "but not settled in some respect"] English?" opposite *canaliculatus*, and Haliday's annotated copy of Curtis (1829) does not annotate the species as Irish. Yet, there are two Irish-marked specimens (redetermined as this species using Schäflein (1971)), one in the DUZM Tardy collection (under the label *fasciatus* Deg.) with green wax on its pin, and another (remounted) in the NMI derived from the Tardy Collection marked 'Ireland' (i.e. originally with green wax). These are likely to be English specimens marked as Irish; this contrasts with *Hydrochara caraboides* (Linnaeus) (Dytiscidae), similarly annotated in Haliday's MS list, but with the DUZM specimen marked English (red wax).

***Agonum micans* Nicolai (Carabidae) - Rejected (confused species)**

This species is apparently not recorded from Leinster apart from the following record (Johnson and Halbert, 1902; Anderson *et al.*, 2000). It is listed in Haliday's MS list as "certainly Irish", "ta ha fu" and "Limerick A.F., L. Neagh, Dodder banks". Presumably, the Tardy record ("ta") corresponds to "Dodder banks"; this record is also cited in Hogan (1854) although without being attributed to Tardy. There are no specimens of *A. micans* in the DUZM Tardy Collection or derived from it in the NMI. However, there is a specimen standing under the label '*simpsoni* Sp.', marked Irish (with green wax on its pin-head). This name is the next after *micans* in Haliday's MS list, but annotated "O" meaning neither name nor Irish status correct. The specimen was redetermined as *Agonum piceum* (Linnaeus). It appears likely that *micans* and *simpsoni* were confused, and *micans sensu* Haliday refers to *piceum*. The *micans* record



must therefore be rejected as apparently confused with *piceum*.

***Anacaena bipustulata* (Marsham) (Hydrophilidae) - Rejected (misidentification)**

This species is not recorded in Ireland (Foster *et al.*, 2009). It is listed under *Hydrobius bipustulatus* Mar. in Haliday's MS list as "ta" (= Tardy) and "locality of specimen indigenous" but name doubtful. There is no mention of this species in Hogan (1854). One of the two *H. bipustulatus* specimens marked Irish in the DUZM was redetermined as *Anacaena lutescens* (Stephens) using Friday (1988) and compared with a reference specimen from the NMI collection.

***Aphodius conspurcatus* (Linnaeus) (Scarabaeidae) - Rejected (marked in error?)**

The identity of the Tardy *Aphodius sticticus* Creu. specimen marked Irish was doubted by Haliday in his MS list, and this specimen, transferred to the NMI in 1901, was determined by Halbert as *conspurcatus* (Johnson and Halbert, 1902) (and confirmed as *conspurcatus* using Jessop (1986)). If an English *Paederus littoralis* could be marked as Irish when the name was confused with *P. riparius* (Linnaeus) (see Good, in press), then the possibility of an English *Aphodius conspurcatus* being marked Irish in confusion with *A. sticticus* cannot be ruled out. *A. sticticus* (= *equestis* Panzer) is recorded as Irish (Johnson & Halbert 1902; Anderson *et al.*, 1997), but I have not come across any other Irish records of *A. conspurcatus*. This Tardy record is an example of the working principle that Tardy specimens marked Irish of closely related species are suspect.

***Aphodius ictericus* (Laicharting) (Scarabaeidae) - Rejected (English specimens marked Irish)**

This species has been recorded (as *A. nitidulus* F.) from Dublin (Johnson and Halbert, 1902). One of the two specimens in the DUZM collection is labelled 'merdarius' in Haliday's hand, and his MS list has *merdarius* entered opposite *ictericus*. However, it is also annotated "O", meaning both provenance and identity doubtful (presumably the identity was corrected to *merdarius*). The specimens are presumably English specimens marked Irish in error.

***Aromia moschata* (Linnaeus) (Cerambycidae) - Accepted (possible importation)**

There are records of this species from near Belfast, Cork and Kerry, as well as an import (Johnson and Halbert, 1902; Speight, 1988; Alexander and Anderson, 2012), and the record near Belfast (Haliday) might also have been an import. The species is listed in Haliday's MS list as "certainly Irish" and "ta, cl, ha". There are two vacant pinholes and a green disc under the label '*Cerambyx moschetus* L.' in the DUZM Tardy collection, but no Tardy specimen could be found in the NMI. This large green species is unlikely to have been confused with any other related species by Tardy (see discussion of *Calosoma inquisitor* in Good (2013) for similar argument), and there is an English specimen of this species in the Tardy collection. The record can be considered valid, but could have been an importation.

***Bembidion properans* (Stephens) (Carabidae) - Rejected (misidentification)**

This species is not recorded from Ireland (Anderson *et al.*, 2000). It is annotated (as *Tachypus properans*) in Haliday's MS list as: "*properans*" (with "?" in pencil), and "certainly Irish". The DUZM specimen was redetermined as *Bembidion lampros* (Herbst) using Luff (2007), so the record must be rejected as a misidentification.

***Bledius talpa* (Gyllenhal) (Staphylinidae) - Rejected (misidentification)**

This species is unknown from Britain or Ireland but occurs in north-west continental Europe (Smetana, 2004; Lott, 2009). The entry in Haliday's MS list for this species is annotated "~~talpa?~~", followed by "certainly Irish" and "common or in many collections" icons, and "ta fornent". The term 'fornent' is taken to mean that the record should refer to the next species (*subterraneus*) and not to *talpa*. There are two specimens mounted on a single card in the NMI collections, derived from the DUZM Tardy collection. These were provisionally redetermined as *Bledius annae* Sharp using Lott (2009) (dissection was not carried out due to the age of the specimens), and as not *B. talpa* using Lohse (1964). The record for *talpa* is therefore invalid due to misidentification.

***Brachinus crepitans* (Linnaeus) (Carabidae) - Accepted (native)**

This species is listed by Haliday as 'certainly Irish' based on a Tardy record from Co.

Wexford (not a townland in Dublin, as stated by Good and Linnie (1990)), and supported by two Tardy specimens in the NMI marked “Ireland” (“T.C. coll., 262.1901”). Although there is a Coulter record from Co. Louth, Coulter specimens appear to have been marked differently (see Appendix 1), so all the *B. crepitans* specimens are therefore considered to be Tardy not Coulter specimens. This record is accepted, as it is a distinctive species unlikely to have been confused by Tardy (see discussion of *Calosoma inquisitor* in Good (2013)), and it is recommended that the species is added to the Irish list (although probably extinct).

***Bradycellus harpalinus* (Audinet-Serville) (Carabidae) - Rejected (English specimen)**

As *Trechus pallidus* Ste. (synonymy following Dawson (1854)), this species is annotated in Haliday’s MS list as “O ta” (i.e. both name and locality (i.e. Ireland) doubtful, Tardy). However, the DUZM collection specimen (redetermined as *Bradycellus verbasci* (Duftschmid) using Luff (2007)) is marked Irish. The specimen must therefore be considered to be marked as Irish in error.

***Calathus ambiguus* (Paykull) (Carabidae) - Rejected (English specimens)**

This carabid is only recorded from one location in Ireland (Anderson and Murray, 2010). In Haliday’s MS list it is annotated, under *Calathus fuscus*, as “~~fuscus~~”, “locality doubtful”, “ta coll.”, “ta coll. qy [= query] [illegible word]”. Clearly, Haliday rejected the species as Irish. However, there are three specimens (one of which was redetermined as *Calathus rotundicollis* Dejean using Luff (2007)), under the label ‘*fuscus*’, in the DUZM Tardy collection marked Irish (with green wax on their pin-heads). As Haliday rejected the record, these would appear to be English specimens marked as Irish, as well as being a misidentification.

***Calosoma inquisitor* Linnaeus (Carabidae) - Accepted (native)**

Recorded in Ireland only from Powerscourt, Co. Wicklow by Tardy and Alfred Furlong, and included on the current Irish list (Anderson *et al.*, 1997). There is one specimen in each of the two museums (DUZM and NMI). The argument for accepting this species, and retaining it on the Irish list (as probably extinct) is given in Good (2013).

***Calosoma sycophanta* (Linnaeus) (Carabidae) - Accepted (adventive)**

The Tardy record is the only reported occurrence of this species in Ireland supported by a specimen (Johnson and Halbert, 1902; Anderson *et al.*, 2000). It is annotated in Haliday's MS list of Irish insects as 'certainly Irish', "ta" (= Tardy) and "J.T. [= James Tardy] had it from Belfast A.F.". A.F. refers to Alfred Furlong, and Haliday is here quoting from Furlong (MS or *in litt.*) that James Tardy had the species from Belfast. It is not clear if the record cited by Fowler (1887) is the Tardy record, but it is unlikely to have been by anyone else at that date: "One example was recorded from the Irish coast in 1815". There is a single specimen marked Irish in the NMI, and derived from the DUZM Tardy collection. The species is a strong flier, and is only known in Great Britain as an adventive (Luff, 1998). It is accepted as a valid record because it is an unmistakable species, and it not impossible that an adventive specimen could reach Ireland.

***Carabus auratus* Linnaeus (Carabidae) - Rejected (English specimen)**

Not currently recorded as Irish (Anderson *et al.*, 2000). This species is annotated "certainly Irish", "ta", and "L. Bray, Mr. Tardy", "bridle road between the lakes, J. Coulter" and "E. Tardy *litt.*" There is a specimen in the DUZM Tardy collection without any trace of green wax on its pin-head, and a vacant pinhole, indicating that there were two specimens originally. No Tardy specimen was traced in the NMI. The specimens were allegedly found on the road between the upper and lower Lough Bray lakes by Thomas Coulter and Elias Tardy (James Tardy's son) (Hogan, 1854), and not by Tardy himself. However, the record is rejected due to possible insertion of an unmarked English specimen for the observation of a different *Carabus* species (see Good, 2013).

***Carabus monilis* Fabricius (Carabidae) - Rejected (marked in error?)**

There are four nineteenth century records of this species from Ireland, but none subsequently (Johnson and Halbert, 1902; Speight *et al.*, 1982; Anderson, 2000; Luff, 2007). One of these is a Tardy record from Dublin. There is a specimen in the NMI labelled "T.C. coll. 262.1901" (T.C. = Trinity College) and "Ireland", which refers to the specimen originating from the

DUZM Tardy collection; there is also a further specimen in the DUZM Tardy collection with green wax on its pin-head (redetermined as *C. monilis* using Luff (2007)). The species is listed in Haliday's MS list as "ta", "Dargle A.F." (= Alfred Furlong) and "Dublin - Mr. Tardy", and in Hogan (1854) as: "Taken by the late J. Tardy Esq." The Dargle (Furlong) specimens may be represented by two specimens labelled "Ireland Haliday" in the NMI, as there is no evidence of Haliday having taken this species himself. However, as the species has been confused with other species like the more widespread *C. arvensis* (e.g. see Johnson's (1885) record, subsequently withdrawn (Johnson and Halbert, 1902)), it cannot be discounted that Tardy's MS recorded *C. monilis* in error, and that an English specimen was inadvertently marked Irish, so the Tardy record must be rejected.

***Carabus nitens* Linnaeus (Carabidae) - Accepted (native)**

This carabid is known from the northern half of Ireland, including near Belfast (Anderson *et al.*, 2000). As Tardy is recorded as having *Calosoma sycophanta* from Belfast, it is likely that either he collected in this part of Ireland, or exchanged specimens with Robert Patterson or Robert Templeton, both who lived in Belfast (Nash, 1983). (One of these gentlemen collected the *Pelophila borealis* (Paykull) specimen figured by Curtis (1840); Curtis refers to Robert Templeton, but the specimen (in the NMI) is labelled "Lgh Neagh Mr Patterson"). It is not an anomaly, therefore, that he should have this species marked Irish in his collection.

***Carabus violaceus* Linnaeus (Carabidae) - Rejected (English specimens)**

Not currently recorded as Irish (Anderson *et al.*, 2000). Annotated as "certainly Irish" and "Dublin Mr. Tardy" in Haliday's MS list, but not listed for Dublin by Hogan (1854) or Johnson and Halbert (1902). The Tardy record is rejected due to possible mislabelling of English specimens as Irish (see Good, 2013).

***Cidnopus aeruginosus* (Olivier) (= *Limonius serraticornis*) (Elateridae) - Rejected (misidentification)**

*Limonius cylindricus* is listed as "Taken by Mr. Tardy" in the neighbourhood of Dublin by Hogan (1854). Johnson and Halbert (1902) cite Hogan's record but state that the "specimens

cannot be traced". There are no other Irish records of this species (Speight, 1989b; Anderson *et al.*, 1997). It is listed under *Limonius cylindricus* in Haliday's MS list as "certainly Irish" and "common or in many collections". Two specimens standing under the label *Limonius serraticornis* Pk. in the DUZM Tardy Collection were determined as not *Cidnopus* but probably *Aplotarsus incanus* (Gyllenhal) using Leseigneur (1972). The record is therefore invalid due to misidentification.

***Clivina collaris* (Herbst) (Carabidae) - Rejected (English specimen)**

This species is not reliably recorded from Ireland (Anderson *et al.*, 2000), although Johnson and Halbert (1902) cite a record as "Ireland, Tardy Coll.", based on Alfred Furlong's MS. In Coulter's copy of Curtis (1837) it is marked as certainly Irish and "Dublin". However, in Haliday's MS list it is listed as "(~~collaris~~)" and "locality doubtful" and "ta [= Tardy]". Clearly, Haliday rejected the record, yet it is listed again in his annotated copy of Curtis (1829) as Irish. Under the label '*collaris*' in the DUZM Tardy collection, there is a green disc and a pinhole but the specimen is missing. No specimen was located in the NMI derived from the Tardy collection. Nevertheless, nearly all the specimens marked Irish in the Tardy Coleoptera collection also have green paper discs beside them, so the presence of a green disc beside the pinhole indicates that the specimen was marked Irish. Because the Irish provenance was doubted by Haliday, this specimen was probably also an English specimen mislabelled as Irish.

***Clytus arietis* (Linnaeus) (Cerambycidae) - Accepted (native)**

There are records of this species from several counties, although some represent imports (Johnson and Halbert, 1902; O'Connor and Nash, 1981; Speight, 1988; Alexander and Anderson, 2012). In Haliday's MS list, it is annotated "certainly Irish" and "ta". The DUZM Tardy specimen was transferred to the NMI, where it was remounted with the label "Ireland" replacing its green-marked pin-head. The record is accepted as it is a distinctive species; there are two twentieth century records for Co. Wicklow, where it is probably native (Alexander and Anderson, 2012).

***Conopalpus testaceus* (Olivier) (Melandryidae) - Accepted (native)**

As stated by Johnson and Halbert (1902), there are: “Two specimens taken by Mr. Tardy (*fide* [Haliday]MS)”, and these “are now in the Dublin Museum and Trinity College collections, and are marked as having been found in Ireland.” There are no further Irish records (Alexander and Anderson, 2012). *C. testaceus* is a distinctive species, unlikely to be confused with any other, but in this case Haliday states in his MS list: “ta coll. marked Irish, 2”. This presumably refers to the two specimens having been marked Irish by Tardy, and not subsequently interpreted as Irish by Haliday. This record is accepted as genuine based on its distinctive appearance and the existence of apparently original Irish-marked specimens.

***Ctenicera pectinicornis* (Linnaeus) (Elateridae) - Rejected (misidentification)**

Listed under *Ludius pectinicornis* in Haliday’s MS list as “locality of specimen indigenous, name incorrect” and “ta”. The two male *Ctenicera* standing under the label *pectinicornis* in the DUZM Tardy Collection were determined as *C. cuprea* using Leseigneur (1972). The only other Irish record of this species was by Stelfox (1947), which on re-examination proved to be a female also of *C. cuprea* (Speight, 1989b). The record is invalid due to misidentification.

***Dendroxena quadrimaculata* (Scopoli) (Silphidae) - Accepted (native)**

Local in Ireland, but found by A. W. Stelfox in Co. Wicklow (O’Mahony, 1929). What is interesting about the Tardy record is that Haliday only mentions the Tardy Collection (“certainly Irish” and “ta” after *Silpha 4-punctata*), yet Hogan (1854) cites “The Dargle” (Co. Wicklow) as the only record. Presumably these refer to the same record; if so, then Haliday must have had more detailed locality data from Tardy’s MSS for species like this, which he omitted from his MS list but which he could relay to Hogan. Ecologically, this is an interesting species because it occurs predominantly in oak woodland canopy, where adults and larvae feed on caterpillars (Hyman and Parsons, 1992). It is therefore in a similar habitat to *Calosoma inquisitor* (Carabidae), recorded by Tardy from Powerscourt in the Dargle Valley. As this species is sufficiently distinctive not to be confused with any other, the record is accepted.

***Dromius agilis* (Fabricius) (Carabidae) - Rejected (unverified specimens)**

Hogan (1854) cites this species as “not uncommon” in the neighbourhood of Dublin, but it was deleted from the Irish list by Speight *et al.* (1982) in the absence of any voucher specimen for the Dublin records. In Haliday’s MS list it is annotated as “certainly Irish” and “common or in many collections”, the latter comment indicating that it may have referred to a species other than *agilis*. Dawson (1854) cites *D. meridionalis* Dejean as a synonym of *D. agilis* F., and perhaps the Tardy *D. agilis* record refers to *D. meridionalis* although this was also recorded separately from Dublin by Hogan (1854). There are three vacant pinholes with a green disc located under the label *Dromius agilis* F. in the DUZM Tardy collection, but no *D. agilis* specimen marked Irish was found in the NMI national collection or in Haliday collection boxes. In the absence of specimens, this species cannot be accepted as a valid Irish record.

***Eutheia scydmaenoides* Stephens (Scydmaenidae) - Rejected (misidentification)**

Two specimens, mounted on the same card, and with traces of green wax on and under the pin-head stand under the name *Eutheia scydmaenoides* in the DUZM Tardy collection. These were determined as *Scydmaenus tarsatus* using Franz and Besuchet (1971), a species subsequently recorded from Dublin (Johnson and Halbert, 1902). In Haliday’s MS list, *E. scydmaenoides* (Haliday, Holywood) is crossed out, and *S. tarsatus* is listed as “certainly Irish” and “ta”. Hogan (1854) also lists *S. tarsatus* as “Taken by Mr. Tardy”.

***Halyzia sedecimguttata* (Linnaeus) (Coccinellidae) - Rejected (English specimen )**

Although this coccinellid is recorded from Dublin and Wicklow (Johnson and Halbert, 1902), it is listed (as *Coccinella 16-guttata*) in Haliday’s MS list as “O ta coll!”, meaning both the name and Irish provenance of the specimen are doubtful. The DUZM specimen, redetermined (with Majerus and Kearns (1989)) as *H. sedecimguttata*, is however marked Irish (with green wax on its pin-head). If the Irish status of the specimen is doubtful according to Haliday, then presumably this is an English specimen marked Irish.

***Harpalus honestus* (Duftschmid) (Carabidae) - Rejected (?-exotic specimen)**

Dawson (1854) cites *annulicornis* Steph. as a synonym of *honestus*. In Haliday’s MS list,



“*annulicornis*” is listed in inverted commas, followed by “O ta” indicating that neither the determination nor its Irish status was correct. Despite this, a specimen stands under the Curtis (1837) label ‘*annulicornis* K.’ in the DUZM Tardy collection, marked as Irish with green wax on its pin-head. Intriguingly, this specimen could not be determined as a British or Irish species, when kindly examined by Dr M. L. Luff (*in litt.*, 1989). This may be an exotic specimen mislabelled as Irish, and the record is rejected for that reason.

***Harpalus tardus* (Panzer) (Carabidae) - Rejected (English specimens)**

*Harpalus luteicornis sensu auct. Brit.* is a synonym of *Harpalus tardus* (Panzer) (Luff, 2007), a species recorded from eastern Ireland (Anderson *et al.*, 2000; Luff, 2007). However, in Haliday’s MS list, it is listed in inverted commas as “*luteicornis*”, followed by “O ta” indicating that neither the determination nor its Irish status was correct. Despite this, three specimens stand under the Curtis (1837) label ‘*luteicornis* Duf.?’ in the DUZM Tardy collection, marked as Irish with green wax on their pin-heads. This is another example of specimens apparently marked as Irish in error, and the record is rejected for that reason.

***Heterocerus marginatus* (Fabricius) (Heteroceridae) - Rejected (misidentification)**

Only known in Ireland from Killarney (Foster, 2010). Annotated in Haliday’s MS list as “certainly Irish” and “ta”, but also with “*fenestratus*” written subsequently in lighter ink, but “*marginatus*” is not crossed out. In Haliday’s annotated copy of Curtis (1829), *H. marginatus* is listed as being in the collection but not Irish. The DUZM Tardy collection specimen marked Irish and standing under the label ‘*marginatus*’ was redetermined as either *Heterocerus flexuosus* Stephens or *H. fossor* Kiesenwetter (as the abdomen was missing, a more precise determination was precluded).

***Hippodamia tredecimpunctata* (Linnaeus) (Coccinellidae) - Rejected (marked in error?)**

This species is worth mentioning because of its rarity in Great Britain and Ireland, the latter with several 19<sup>th</sup> century records but only one 20<sup>th</sup> century record (from Co. Offaly) (Speight, 1990). The Dublin record of Halbert (1894) confirms this species as occurring in Tardy’s collecting area. Hogan (1854) records it as “Portmarnock? On willows”, and Haliday’s MS list

is annotated as “ha! ta coll!”; presumably the ‘Portmarnock?’ record is from Haliday. The single specimen in the DUZM Tardy collection has green wax on its pin-head and bears label with “*Hippodamia 13-punctata*” in Haliday’s hand. However, because of the variability of elytral markings on this and related species (there are 13-spot varieties of the eyed ladybird (*Anatis ocellata* (Linnaeus), for instance (Majerus and Kearns, 1989)), it is possible that Tardy’s MS record could be based on a different species, and in this circumstance it cannot be discounted that an English *H. tridecimpunctata* was marked Irish in error (see Good, 2013). The record is rejected (and this is also worth recording in case this specimen might be included in a future study of colour variation amongst Irish specimens of this species).

***Hydaticus transversalis* (Pontoppidan) (Dytiscidae) - Rejected (English specimen)**

Listed in Haliday’s MS list as “ta coll! ~~Furlong!~~”, with an oblique z-shaped squiggle in the column where the species status is normally annotated. As mentioned by Johnson and Halbert (1902), Haliday did not mark it as ‘certainly Irish’, so the record should not be considered valid. It is not listed in Hogan (1854). However, there are two specimens. One is in the NMI, repinned and labelled “Ireland” and “T.C. Coll., 262.1901”. The other is in the DUZM Tardy collection (determined using Schäflein (1971) and Sutton (2008)), and has also been repinned, so the original waxed pin is lost but there is also no green paper disc beside the specimen (which usually accompanies green-waxed specimens). Based on the NMI specimen, it would appear to be similar to *Acilus canaliculatus* above, as another example of a species marked as Irish in error.

The three catalogues raise a further anomaly in the case of this species. Coutler’s copy of Curtis (1837) marks *Hydaticus transversalis* as present in the collection but not Irish, conforming to the above conclusion. Haliday’s annotated copy of Curtis (1829), in contrast, lists *Hydaticus transversalis* as Irish but not in the collection, and *Hydaticus hybneri* F. (= *seminiger* (DeGeer)) as present in the collection, but not Irish. It is likely that there was some confusion between *transversalis* and *hybneri*, and this may explain why this record has been difficult to interpret. Under the name *transversalis* in Haliday’s MS list is the annotation “~~hybneri~~”. Note

from above that ‘Furlong!’ is also crossed out. It is not impossible that the records of *hybneri* and *transversalis* were mixed up in the annotated copy of Curtis, where *hybneri* should be recorded as Irish (ex Furlong, later to be deleted) and *transversalis* as present in the Tardy Collection but not Irish. This interpretation supports the conclusion that the record is invalid and the NMI specimen is mislabelled as Irish. There are no other Irish records of this species (Foster and Friday, 2011).

***Hydrophilus piceus* (Linnaeus) (Hydrophilidae) - Rejected by Haliday**

Two specimens stand under the name *piceus* in the DUZM Tardy collection, without any wax marking on their pins and lacking any coloured paper discs beside them, and the pin type is not similar to that used by Tardy. The annotation in Haliday’s MS list reads “name investigated, locality doubtful”, “ta”, followed by “Furlong!” and ““Glasnevin Dr Coulter *sed qy* [query]”” (the latter presumably being a quote from Furlong correspondence). (Note also that “ta” refers to the Tardy collection, which includes several specimens added by Coulter). It is therefore probable that the two specimens are Coulter specimens (Coulter is recorded by Thompson (1844) as having “added to” to the Tardy collection). It appears that Haliday queried the records as Irish, and Hogan (1854) did not list this species in his Dublin list although it was allegedly recorded from Glasnevin, Co. Dublin (which must have been before 1843, the year of Coulter’s death). The record is invalid as the specimen was queried as Irish by Haliday.

***Hydrothassa glabra* (Herbst) (Chrysomelidae) - Rejected (confused species)**

Listed from “the neighbourhood of Dublin” in Hogan (1854) as “*Helodes auctus* F. Taken by Mr Tardy”; this is the only Irish record (Johnson and Halbert, 1902), and it is not currently on the Irish list (Anderson *et al.*, 1997). It is listed under *Chrysomela aucta* in Haliday’s MS list as “certainly Irish”, “ta” (in pencil) and, surprisingly, “common or in many collections” (in ink). There are two specimens under the label *Helodes aucta* F. in the DUZM Tardy collection, but these are marked English and not Irish. No Tardy specimen was found in the NMI. However, there are two DUZM specimens under the label *Chrysomela marginella* marked Irish (and redetermined as *Hydrothassa marginella* (Linnaeus) using Mohr (1966)), yet *C. marginella* is

listed in Haliday's MS list as "locality of specimen indigenous, name incorrect". In Haliday's copy of Curtis (1829), *Chrysomela marginella* L. is marked as in the DUZM collection and Irish, but *Chrysomela aucta* F. is marked also as in the collection, but not Irish. The two species appear to have been initially confused by Haliday, but, if this was the case, he omitted to update his MS list.

***Hygrobia hermanni* (Fabricius) (Paelobiidae) - Rejected (misinterpreted species)**

This species is frequent in the south of Ireland (Foster and Friday, 2011). Johnson and Halbert (1902) mention a Wicklow record (as *Pelobius tardus* Herbst) from Haliday's MS list: "From notes in Mr. Haliday's MS list, it is evident that the Wicklow specimens were taken by the late Mr. J. Tardy, and were seen by Mr. Haliday in the Furlong collection in 1849." However, their interpretation may be incorrect. The annotation in Haliday's MS list (p. 11) reads: "'Mr Furlong", in 1<sup>st</sup> pond on road from Lara to Rathdrum." ta! Furlong ! has specimens (1849)". My interpretation of this is that Furlong collected the Wicklow specimens, and wrote to Haliday in 1849 informing him of the record. The Tardy "ta!" is independent; Haliday used this annotation for specimens which were in Tardy's collection and notable, but not necessarily Irish. In fact, the three specimens in the DUZM collection are marked English, as are many species also marked "ta!" in Haliday's list. Thus, there is no Tardy Irish record for this species.

***Hypocaccus rugiceps* (Duftschmid) (Histeridae) - Rejected (misidentification)**

This histerid has been recorded from Co. Antrim (Johnson and Halbert, 1902). There is a specimen standing under the label '*Hister 4-striatus* Pk' (a synonym of *H. rugiceps*) in the DUZM Tardy collection, but this species is not mentioned in Haliday's MS list. However, '*Hister dimidiatus* Pk' (now *Hypocaccus dimidiatus* Illiger) is listed in his MS list, annotated "ta. fu. [= Furlong]" and "Ptmk. [= Portmarnock (Co. Dublin)] Tramore", although '*Hister dimidiatus*' is not represented in the DUZM collection. Hogan (1854) also cites *Hister dimidiatus* Pk. from Portmarnock. The specimen in the DUZM Tardy collection was redetermined as *Saprinus aeneus* (Fabricius) (using Witzgall (1971) and Duff (2012)), so the Tardy record must be treated as a misidentification.

***Ilybius fenestratus* (Fabricius) (Dytiscidae) - Rejected (misidentification)**

Not recorded from Ireland (Foster *et al.*, 2009). Listed under *Colymbetes fenestratus* in Haliday's MS list as "ta" (= Tardy) and "locality of specimen indigenous, name [doubtful]". There is one specimen with green wax on its pin-head under this name in the DUZM Tardy Collection, determined as *Ilybius aenescens* Thomson using Schäflein (1971). The record of *I. fenestratus* is invalid due to misidentification.

***Ischnomera caerulea* (Linnaeus) (Oedemeridae) - Rejected (probable Haliday list error)**

This is a species which has not been recorded from Ireland (Johnson and Halbert, 1902; Anderson *et al.*, 1997), but which is nevertheless annotated (under *Oedemera cerulea*) in Haliday's MS list as "certainly Irish" and "ta" (= Tardy collection). It is also marked in Haliday's copy of Curtis (1829) as being in the DUZM collection and Irish. However, the three specimens in the DUZM Tardy collection, under the label *Oedemera caerulea* L., are all marked as English. The Tardy specimens were redetermined as *Oedemera nobilis* (Scopoli) using Vázquez (2002) (and the slightly differently spelled *O. coerulea* (Linnaeus) (*sensu* Donovan, 1801)) is a synonym of *Oedemera nobilis* (Scopoli) (Vázquez, 2002), so it is possible that *nobilis* was being referred to). This record is hardly as a result of confusion with *Ischnomera sanguinicollis* (Fabricius), as the latter is also marked (in Haliday's MS list) as "certainly Irish" and "ta" directly below the entry for *O. cerulea*. It must therefore be concluded to be recorded as Irish in error by Haliday; notwithstanding the fact that *O. nobilis* has been recently found in south-east Ireland (McCormack and Guinan, 2010).

***Ischnomera sanguinicollis* (Fabricius) (Oedemeridae) - Accepted (native)**

Annotated in Haliday's MS list (as *Asclera sanguinicollis* F.) as "certainly Irish" and "ta", and also marked as Irish in Haliday's annotated copy of Curtis (1829). This record was also cited by Johnson and Halbert (1902), who stated that: "There are Irish examples of this species in the collections of the Dublin Museum and Trinity College." Both the DUZM (under the label '*Ademera ruficollis*') and NMI specimens were redetermined as *Ischnomera sanguinicollis* using Vázquez (2002). The species was subsequently recorded in the twentieth century by A. W.

Stelfox and M. C. D. Speight from the Dargle Valley, Co. Wicklow (Speight, 1985), an area which Tardy would have visited. As this is a distinctive species, it is unlikely to have been confused with a related species, so the record is considered valid (see discussion of *Calosoma inquisitor* in Good, 2013).

***Lebia chlorocephala* (Hoffman) (Carabidae) - Accepted (native)**

There are only three records of this species from Ireland, all from the nineteenth century (Anderson *et al.*, 2000). Two records are listed under *Lamprias chlorocephala* in Haliday's MS list with the annotation: "certainly Irish ta", "Wexford, Tardy" and "Woodenbridge, A.F. [= Alfred Furlong]". These are the only records from eastern Ireland. There are two Tardy specimens (redetermined as *L. chlorocephala* using Luff (2007)) in the DUZM Tardy collection; the two in the NMI marked "Ireland" may represent Furlong or Haliday specimens. This species, like *Brachinus crepitans* (see Good, in press) is unmistakable, and represented by specimens with a recorded locality (Wexford). It was unlikely to have been confused by Tardy; the only similar species being the local *L. cyanocephala* which is restricted to southern England (Luff, 2007). The record can therefore be accepted. Furlong's Woodenbridge record is very precise: "6 June, 1853, 5 p.m. on bridge" (Johnson and Halbert, 1902), but it is not clear if the specimen was captured or just seen. In Britain, *L. chlorocephala* is local and somewhat elusive, being associated with rough grassland and open woodland (Luff, 1998; Turner, 2008). Like *Brachinus crepitans* above, it is a larval ectoparasite (in this case on leaf-beetles (*Chrysolina banksi* (Fabricius) and related species)).

***Leistus ferrugineus* (Linnaeus) (Carabidae) - Rejected (misidentification)**

This species was deleted from the Irish list by Speight *et al.* (1982) and Anderson *et al.* (2000) due to insufficient evidence for its Irish status. It is listed in Haliday's MS list as *L. spinilabris* and 'certainly Irish' but not specifically Tardy. Hogan (1854) refers to it as "very local" in the neighbourhood of Dublin. The specimen marked Irish standing under the label 'spinilabris Pz.' in the DUZM Tardy collection was redetermined as *L. terminatus* (Hellwig) using Luff (2007).

***Magdalis ruficornis* (Linnaeus) (Curculionidae) - Rejected (unverified specimen)**

Cited (as *M. pruni* Linnaeus) by Johnson and Halbert (1902) from one Irish record: “Ireland (H. [= Haliday] coll.)”. Morris (1993b) considered the species to be doubtful as it has not been recorded since and no Irish specimens were found in the National Collection in the NMI. It is not mentioned either in Haliday’s MS list or by Hogan (1854), but there is a specimen under the label ‘*Magdalis pruni* L.’ in the DUZM Tardy collection with a green disc beside it. Unusually, however, the specimen is a McNab specimen, such as frequently occurring in the NMI collections, and not a Tardy specimen. Possibly the specimens were swapped, and it is now represented by the specimen in the Haliday collection determined as *M. pruni* by Halbert. But even if this is so and a specimen marked Irish exists, the record is unreliable because it is not verified by Haliday (in either his MS list or by Hogan (1854)).

***Malthodes minimus* (Linnaeus) (Cantharidae) - Rejected (unverified specimens)**

Not reliably recorded from Ireland (Alexander and Anderson, 2012). Listed in Haliday’s MS list as “certainly Irish” and “common or in many collections”, but by Hogan (1854) only as “Taken by Mr. Tardy”. Johnson and Halbert (1902) query if this record refers to *Malthodes pumilus* (Brébisson) (= *atomus* Thomson) which they cite as subsequently recorded from Dublin. Of the four specimens standing under the label *Malthinus minimus* L. in the DUZM Tardy collection, the male examined was in too poor condition to determine reliably. The record cannot be confirmed due to lack of reliable specimens.

***Monochamus sutor* (Linnaeus) (Cerambycidae) - Accepted (probable importation)**

This species has been recorded as an imported specimen (Speight, 1988), but Johnson and Halbert (1902) stated that there was a specimen marked Irish in the NMI which “had been for many years in the collection of Trinity College Dublin”. In Haliday’s MS list, this species is annotated “*Monochamus sartor*”, “? *sutor*”, and with the “certainly Irish” icon and “ta” [= Tardy]. In the DUZM Tardy collection, there is a space and vacant pinhole (and with coloured disc missing) under the label ‘*Cerambyx sartor* L.’ The Tardy specimen determined by Halbert is most probably an introduction, as this species is only known as such in Great Britain (Duff,

2008a).

***Nebrioporus depressus* (Fabricius) (Dytiscidae) - Rejected (probable Haliday list error)**

Although common in Ireland (Foster and Friday, 2011), this record (as *Hydroporus depressus* F.) is nevertheless curious as it is recorded in Haliday's MS list as "certainly Irish" and "ta" (= Tardy collection), but is only represented in the Tardy collection by an English specimen (and with no vacant pinholes). It is not marked as Irish in Coulter's annotated copy of Curtis (1837). The species is also annotated "ha!" (= Haliday), but this is in weaker ink subsequent to the above annotations; it would be expected that the cross within a circle, indicating Irish status, would be in weaker ink if it was added on the basis of the Haliday record. It is listed by Hogan (1854) from Loughlinstown (Co. Dublin), but this is more likely to be the Haliday record.

***Neocoenorrhinus interpunctatus* (Stephens) (Rhynchitidae) - Rejected (misidentification)**

Recorded (as *Rhynchites alliariae* L.) by Hogan (1854) as "Taken by Mr. Tardy". According to Morris (1993b), there are no records of this species from Ireland other than the Tardy record cited in Hogan (1854). There is one specimen marked Irish under the label *Rhynchites alliariae* in the DUZM Tardy collection. This was redetermined as *Neocoenorrhinus germanicus* (Herbst) using Morris (1990), Gønget (2003) and an English reference specimen in the NMI.

***Olibrus corticalis* (Panzer) (Phalacridae) - Rejected (unverified specimen)**

This species is annotated in Haliday's MS list as "certainly Irish", "ta" (= Tardy collection), and "m.b." (= Mary Ball). The only Irish record given in Johnson and Halbert (1902) is from Hogan's (1854) list: "Taken by Miss M. Ball", but *O. corticalis* is not currently listed as Irish (Anderson *et al.*, 1997). No specimens, either marked Irish or English, were located in the DUZM Tardy collection. As the species entry in Haliday's MS list is in lighter ink to the preceding species (*O. aeneus*), it was added subsequent to his initial list, and as both 'ta' and 'm.b.' are in the same ink perhaps Haliday attributed the Ball specimen to the Tardy collection, meaning the DUZM collection in general (where it could have been deposited by her brother, Valentine Ball, who was Director of the Museum in the 1840s (Linnie, 2010)). However, in the absence of a specimen, the record cannot be accepted.



***Orchesia micans* (Panzer) (Melandryidae) - Rejected by Haliday**

Recorded from Kerry and several sites in Northern Ireland (Alexander and Anderson, 2012), but not from eastern Ireland (Leinster or near Belfast). It is listed in Haliday's MS list as "*Orchesia micans*", with a vertical pencil line through each name, and "certainly Irish" and "ta [= Tardy] but q[uer]y if not marked [indeterminate word reading like 'bgenr']". It thus appears that Haliday queried the record, and it is not subsequently mentioned in Hogan (1854) or Johnson and Halbert (1902). In the copy of Curtis (1829) annotated by Haliday, it is not marked as Irish. There is one specimen marked Irish standing under this name in the DUZM Tardy collection. The record must be rejected as it was not accepted by Haliday.

***Otiorhynchus clavipes* (Bonsdorff) (Curculionidae) - Rejected (misidentification)**

This species is only known in Ireland from one Antrim record (O'Mahony, 1938; Morris, 1993a). This is not one of the few *Otiorhynchus* species which are listed in Haliday's MS list, but Hogan (1854) refers to *O. tenebricosus* Herbst (a synonym, *sensu auct.*, of *O. clavipes*) as being recorded from Co. Dublin: "Baldoyle, on hedges". There are three specimens marked Irish under the label *O. tenebricosus* in the DUZM Tardy collection. These were determined as *O. atroapterus* (DeGeer) using Morris (1997), a common and widely distributed weevil (Morris, 1993a).

***Paederus littoralis* Gravenhorst (Staphylinidae) - Rejected (English specimen)**

Not currently recorded as Irish (Good and O'Connor, 2009). Originally annotated as "certainly Irish", but subsequently crossed out in Haliday's MS list, and apparently represented by an English specimen marked Irish (see Good, 2013).

***Pedinus femoralis* (Linnaeus) (Tenebrionidae) - Rejected (misidentification)**

Listed in Haliday's MS list as "certainly Irish" and "ta" (= Tardy). In the copy of Curtis (1829) annotated by Haliday, *Pedinus gibbium* F., for which *P. femoralis* Mar. is listed as a synonym (Curtis, 1829), is annotated as present in the collection and Irish. *Phylan gibbus* (Fabricius) has been recorded from Dublin (Johnson and Halbert, 1902), whereas *Pedinus femoralis* is not known from either Great Britain or Ireland (Barclay, 2008). The specimen

standing under the name *Pedinus femoralis* in the DUZM Tardy Collection was redetermined as *P. gibbus* using Kaszab (1969). The record of *Pedinus femoralis* is therefore rejected due to probable synonymy or misidentification.

***Platydracus* (= *Staphylinus*) *stercorarius* (Olivier) (Staphylinidae) - Rejected (misidentification)**

Not recorded from Ireland (Lott and Anderson, 2011), and not listed by Hogan (1854). In Haliday's MS list it is annotated "O ta", meaning both identification and Irish status doubtful. However, there is a specimen marked Irish (pin-head with green wax) under the label '*Staphylinus stercorarius*' in the DUZM Tardy collection; this was redetermined as *S. erythropterus* using Lohse (1964).

***Pogonus luridipennis* (Germar) (Carabidae) - Rejected (probable Haliday list error)**

This species is very local in southern England and not known from Ireland (Anderson *et al.*, 2000; Luff, 2007). The following is annotated in Haliday's MS list: "~~burrellii~~", "locality of specimen indigenous, name [doubtful]", "ta [= Tardy]!", and "*luridipennis* Germ." There are no specimens of *Pogonus* marked Irish in the DUZM Tardy collection, but there are two specimens under the label '*burrellii*' marked with yellow wax on their pin-heads and a yellow disc (i.e. neither Irish nor English; possibly Welsh). One of these was redetermined as *P. luridipennis* (using Luff (2007) and Trautner and Geigenmüller (1987)). It appears that this is, like *Oedomera caerulea*, an example of English specimens being inadvertently recorded as Irish in Haliday's MS list.

***Pterostichus macer* (Marsham) (Carabidae) - Rejected (marked in error?)**

The only Irish record is that based on the Tardy specimens (Speight *et al.*, 1982). Johnson and Halbert (1902) referred to this record (under *P. picimanus* Duftschmid) as follows: "Dublin (taken by the late Mr. Tardy '53 Hn. [= Hogan, 1854: listed as *Adelosia picea* Stephens]; '54 Ds. [= Dawson, 1854]. There are Irish specimens of this species in the Dublin Museum and Trinity College collections." In Haliday's MS list, it is annotated "certainly Irish", "ta [= Tardy]" and "near Dublin", with what appears to be an effaced question-mark after 'near

Dublin'. This corresponds to the entry in Coulter's copy of Curtis (1837), where the species is marked as 'certainly Irish', and "Dublin?"

There are two Tardy specimens (redetermined as *P. macer* using Lindroth (1974) and Trautner and Geigenmüller (1987)); one in the DUZM has been repinned with a modern headless pin, and another in the NMI which has been repinned with a black modern pin, mounted and labelled "T.C. Coll. 262.1901" and "Ireland" (i.e. derived from the Tardy collection and originally with a green wax pin-head).

The recorded distribution of *P. macer* in Great Britain is generally eastern and southern, although it has been recorded from Wales (Luff, 1998). It appears to be an elusive subterranean species which could be easily missed (Lane *et al.*, 1999), but the Tardy record cannot be accepted because it could have been originally confused with related *Pterostichus* species, and English specimens inadvertently marked as Irish (see Good, 2013).

***Rhagium inquisitor* (Linnaeus) (= *indagator* Fabricius) (Cerambycidae) - Rejected by Haliday**

This species has not been recorded from Ireland (Anderson *et al.*, 1997). There are two specimens under the label *Rhagium indagator* F. in the DUZM Tardy collection. These were redetermined as *R. mordax* (DeGeer) using Bense (1995). In Haliday's MS list, *indagator* is annotated with the "certainly Irish" icon crossed out in pencil, followed by "ta. ha"; and "*indagator*" is circled in pencil with "error" in pencil beneath.

***Rhagonycha testacea* (Linnaeus) (Cantharidae) - Rejected (misidentification)**

Not recorded from Ireland (Anderson *et al.*, 1997). Annotated as *Telephorus testaceus* in Haliday's MS list as "certainly Irish" and "common or in many collections". Hogan (1854) records it as "Taken by Mr. Tardy" in the neighbourhood of Dublin. Although also subsequently recorded in Co. Dublin and near Belfast, Johnson and Halbert (1902) stated that they had not seen Irish specimens, and the species is not on the current Irish list (Anderson *et al.*, 1997). Two of the specimens standing under the label '*Telephorus testaceus*' in the DUZM Tardy Collection were redetermined as *Rhagonycha limbata* Thomson using Fitton and Eversham (2008) with a

reference specimen from the NMI.

***Soronia punctatissima* (Illiger) (Nitidulidae) - Accepted (native)**

Recorded by A.W. Stelfox from Co. Wexford (Alexander and Anderson, 2012) (rather than from Co. Cavan as reported by Speight (1989a)). The only record which Johnson and Halbert (1902) cited was based on an NMI Tardy specimen: “There is an Irish-taken example of this insect in the Dublin Museum, which had been for many years in the Trinity College collection.” This NMI specimen is labelled “Ireland” and “T.C. coll. 262.1901”, showing it to be a Tardy specimen. There is also a specimen in the DUZM Tardy collection, marked Irish and standing under the label ‘*Nitidula fulva*’ which is not a Curtis (1837) label. No mention of ‘*Nitidula fulva*’ could be found in the literature, and Haliday’s MS list does not refer to either *punctatissima* or ‘*fulva*’, but *S. grisea* (Linnaeus) is annotated “common or in many collections”. It appears that the specimens recorded as *grisea* by Haliday are actually *punctatissima*, but given the distinctiveness of this genus compared to other Irish nitidulids, it is unlikely to have been confused with a related genus in Tardy’s MS list, and can therefore be accepted as Irish.

***Stenolophus teutonius* (Schrank) (Carabidae) - Rejected (misidentification)**

Not recorded from Ireland (Anderson *et al.*, 2000; Luff, 2007). In Haliday’s MS list *Stenolophus vaporariorum* is annotated “certainly Irish”, “ta coll.”, and “*teutonius* Schra.” Although there is no specimen (or space for one) in the Tardy collection under this name, possibly Haliday was referring to the single specimen marked Irish under the ‘*Trechus suturalis* Lea.’ label in the DUZM collection. This is deduced from the following entry further up on the same page on his MS list: “~~*suturalis*~~”, “~~certainly Irish-ta~~”, and “error for *vaporariorum*”. The specimen was redetermined as *Bradycellus harpalinus* (Audinet-Serville), so the record appears to be a misidentification.

***Tenebrio molitor* Linnaeus (Tenebrionidae) - Rejected (probable Haliday list error)**

*T. molitor* is listed in Haliday’s MS list as “certainly Irish” and “ta” (= Tardy). In the copy of Curtis (1829) annotated by Haliday, however, it is listed as not Irish. It is not listed by Hogan

(1854), and Johnson and Halbert (1902) do not mention a nineteenth century record from Leinster. There are no specimens of this species in the DUZM Tardy collection or derived from it in the NMI.

This species does not appear to have been confused with *T. obscurus* Fabricius by Haliday, as both are marked as “certainly Irish” and “ta”. The possibility that *T. molitor* occurred under the *T. obscurus* label in the Tardy collection was ruled out; both DUZM specimens were redetermined as *T. obscurus*. There are no Tardy specimens of either species in the NMI. The most likely possibility is that Haliday originally entered *T. molitor* (which is entered first, in darker ink) but then redetermined the record to the *T. obscurus* (which is entered subsequently in lighter ink), but omitted to delete the *T. molitor* entry in his MS list.

As this is a well-known pest and aviary foodstuff species, its occurrence in the Tardy Collection would not be significant in itself, but it is the entry in Haliday’s MS list without correction that makes it notable.

***Trachyphloeus scabriculus* (Linnaeus) (Curculionidae) - Rejected (misidentification)**

Only reliably recorded from West Cork (Morris, 1997). Like many weevils, this species is listed without annotation in Haliday’s MS list; however, Hogan (1854) cites it (under *Trachyphlaeus scabriculus* L.) as “Taken by Mr. Tardy” in the neighbourhood of Dublin. Johnson and Halbert (1902) could not trace any Irish specimens of this species. A specimen, with traces of green wax on its pin-head, standing under the label for this species in the DUZM Tardy collection, was redetermined as *Caenopsis waltoni* (Boheman) using Morris (1997), which has been recorded from Wicklow (Morris, 1993a).

***Triplax aenea* (Schaller) (Erotylidae) - Rejected (unverified specimens)**

There are no other Irish records other than the Tardy record, and it was omitted from the Irish list (Anderson *et al.*, 1997) because of its doubtful status; Johnson and Halbert (1902) stated that: “It would seem to have been one of the late J. Tardy’s captures, but the specimens cannot be traced.” It is listed in Haliday’s MS list as “certainly Irish” and “ta”, and in Hogan (1854) as “Taken by Mr. Tardy”. There is a single specimen in the DUZM Tardy collection labelled

'*Triplax aenea*' in Haliday's hand. However, there is no trace of either green or red wax on the pin-head, nor is there a green or red paper disc beside the specimen as is typical of nearly all other specimens in the collection. If this is the Tardy specimen that Haliday referred to in his MS list, it is unusual as it is totally unmarked. No Tardy specimen was located in the NMI. The record is invalid due to the unmarked specimen which cannot be determined with certainty as Irish.

## Discussion

Of the surprising number of species not recorded from Ireland in a superficial perusal of the label names in the DUZM Tardy collection, most were found to be misidentifications or not accepted as Irish by Haliday (Table 1). Ten of the set of species not accepted by Haliday were apparently represented by English (9) or exotic (1) specimens marked as Irish, probably due to unlabelled specimens being picked, as surmised by Stelfox (1927) (see Appendix 2), to represent closely related species. Those species which remain, after exclusion of misidentified and unaccepted species, can be divided into two categories.

The first category is a set of species which are rejected because of their similarity to related Irish species and which could be represented by an English specimen inadvertently marked Irish. These are rejected because of uncertainty that they are Irish; however, the level of error in misinterpretation in Haliday's MS list is low (see Good, 2013), so while there is not enough certainty to accept any of these as records for individual species, there is still some probability that the Tardy record of these species is correct. The five species are (with the only or a critical Irish record marked with an asterisk): *Aphodius conspurcatus*\*, *Carabus monilis*\*, *Carabus violaceus*\*, *Hippodamia tredecimpunctata* and *Pterostichus macer*\*

The second category are eight species whose native identity is accepted: *Brachinus crepitans*\*, *Calosoma inquisitor*\*, *Carabus nitens*, *Clytus arietus*, *Conopalpus testaceus*\*, *Dendroxena quadrimaculata*, *Ischnomera sanguinicollis* and *Lebia chlorocephala*.

Taking the two categories together, on a probability basis the worst case estimate of species

extinction in eastern Ireland is seven species out of 391 (407 species determined in the Tardy collection (see methods section) minus 16 rejected by Haliday or unverified), or 1.8%. The best case estimate of extinction, based solely on the second category (3 out of 391), is 0.8%. Of course, it can be argued that species like *Conopalpus testaceus* may be still extant and simply missed. There is some likelihood for such a false negative, given that subsequent records of species like *Clytus arietus*, *Dendroxena quadrimaculata*, *Hippodamia tredecimpunctata*, *Melandrya caraboides* (Linnaeus), *Ischomera sanguinicollis* and *Soronia punctatissima* are distinctly scarce, despite extensive collecting in Dublin, Wicklow and Wexford by entomologists such as Haliday, Halbert, Stelfox, O'Mahony, Speight, O'Connor, Anderson and Alexander. On the other hand, there is also the possibility of species not recorded from Ireland being present amongst the specimens in the Tardy collection which were not redetermined. Balancing these points and taking the probabilities mentioned above into account, we can make a rough estimate of a 1% most probable loss of beetle biodiversity during the nineteenth century in eastern Ireland.

Of ecological interest, in addition, is the distribution of the seven probably extinct species from both categories by habitat. Translating from species to habitat for these, we get the following result: oak canopy; oak canopy branches; horse dung; coastal cliff, sea-wall and shingle; calcareous cultivated soil; woodland and garden soils; coastal saltmarsh clay soils.

There are also two sets of species emerging from the group of seven Tardy species accepted as Irish, but possibly regionally extinct. One comprises species which are ectoparasitic on the pupae of other Coleoptera (*Brachinus crepitans*, *Lebia chlorocephala*), and the other which associated with oak canopy (*Calosoma inquisitor*, *Conopalpus testaceus*, *Dendroxena quadrimaculata*). The latter species was recorded from Co. Wicklow in the 1920s, but the preceding two have not been recorded since Tardy's time. Loss of oak woodland fauna in Co. Wicklow was pointed out by Speight (1980), and it would be worthwhile establishing if *D. quadrimaculata* still occurs in oak woodland conservation areas in Co. Wicklow.

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**TABLE 1.** Alphabetical check-list of notable or unique Irish records based on names in the DUZM Tardy collection, and either in Haliday's MS list or in Hogan (1854), or of species which provide examples of errors in the interpretation of the collection. Details of these records are given in the text. Nomenclature follows Duff (2008b), Lucht (1987) and Smetana (2004).

<i>Acilius canaliculatus</i> (Nicolai)	Dytiscidae	Rejected - English specimen
<i>Agonum micans</i> Nicolai	Carabidae	Rejected - confused species
<i>Anacaena bipustulata</i> (Marsham)	Hydrophilidae	Rejected - misidentification
<i>Aphodius conspurcatus</i> (Linnaeus)	Scarabaeidae	Rejected - error?
<i>Aphodius ictericus</i> (Laicharting)	Scarabaeidae	Rejected - English specimen
<i>Aromia moschata</i> (Linnaeus)	Cerambycidae	Accepted -possible importation
<i>Bembidion properans</i> (Stephens)	Carabidae	Rejected - misidentification
<i>Bledius talpa</i> (Gyllenhal)	Staphylinidae	Rejected - misidentification
<i>Brachinus crepitans</i> (Linnaeus)	Carabidae	Accepted
<i>Bradycellus harpalinus</i> (Audinet-Serville)	Carabidae	Rejected - English specimen
<i>Calathus ambiguus</i> (Paykull)	Carabidae	Rejected - English specimens
<i>Calosoma inquisitor</i> (Linnaeus)	Carabidae	Accepted (see Good, 2013)
<i>Calosoma sycophanta</i> (Linnaeus)	Carabidae	Accepted - adventive
<i>Carabus auratus</i> Linnaeus	Carabidae	Rejected - English specimen
<i>Carabus monilis</i> Fabricius	Carabidae	Rejected - error?
<i>Carabus nitens</i> Linnaeus	Carabidae	Accepted
<i>Carabus violaceus</i> Linnaeus	Carabidae	Rejected (see Good, 2013)
<i>Cidnopus aeruginosus</i> (Olivier)	Elateridae	Rejected - misidentification
<i>Clivina collaris</i> (Herbst)	Carabidae	Rejected - English specimen
<i>Clytus arietus</i> (Linnaeus)	Cerambycidae	Accepted
<i>Conopalpus testaceus</i> (Olivier)	Melandryidae	Accepted
<i>Ctenicera pectinicornis</i> (Linnaeus)	Elateridae	Rejected - misidentification
<i>Dendroxena quadrimaculata</i> (Scopoli)	Silphidae	Accepted
<i>Dromius agilis</i> (Fabricius)	Carabidae	Rejected - unverified specimens
<i>Eutheia scydmaenoides</i> Stephens	Scydmaenidae	Rejected - misidentification

<i>Halysia sedecimguttata</i> (Linnaeus)	Coccinellidae	Rejected - English specimen
<i>Harpalus honestus</i> (Duftschmid)	Carabidae	Rejected - ?-exotic specimen
<i>Harpalus tardus</i> (Panzer)	Carabidae	Rejected - English specimen
<i>Heterocerus marginatus</i> (Fabricius)	Heteroceridae	Rejected - misidentification
<i>Hippodamia tredecimpunctata</i> (Linnaeus)	Coccinellidae	Rejected - error?
<i>Hydaticus transversalis</i> (Pontoppidan)	Dytiscidae	Rejected - English specimen
<i>Hydrophilus piceus</i> (Linnaeus)	Hydrophilidae	Rejected by Haliday
<i>Hydrothassa glabra</i> (Herbst)	Chrysomelidae	Rejected - confused species
<i>Hygrobia hermanni</i> (Fabricius)	Paelobiidae	Rejected - misinterpreted
<i>Hypocaccus rugiceps</i> (Duftschmid)	Histeridae	Rejected - misidentification
<i>Ilybius fenestratus</i> (Fabricius)	Dytiscidae	Rejected - misidentification
<i>Ischnomera caerulea</i> (Linnaeus)	Oedemeridae	Rejected - Haliday list error
<i>Ischnomera sanguinicollis</i> (Fabricius)	Oedemeridae	Accepted
<i>Lebia chlorocephala</i> (Hoffman)	Carabidae	Accepted
<i>Leistus ferrugineus</i> (Linnaeus)	Carabidae	Rejected - misidentification
<i>Magdalis ruficornis</i> (Linnaeus)	Curculionidae	Rejected - unverified specimen
<i>Malthodes minimus</i> (Linnaeus)	Cantharidae	Rejected - unverified specimen
<i>Monochamus sutor</i> (Linnaeus)	Cerambycidae	Accepted - probable introduction
<i>Nebrioporus depressus</i> (Fabricius)	Dytiscidae	Rejected - Haliday list error
<i>Neocoenorrhinus interpunctatus</i> (Stephens)	Rhynchitidae	Rejected - misidentification
<i>Olibrus corticalis</i> (Panzer)	Phalacridae	Rejected - unverified specimen
<i>Orchesia micans</i> (Panzer)	Melandryidae	Rejected by Haliday
<i>Otiorhynchus clavipes</i> (Bonsdorff)	Curculionidae	Rejected - misidentification
<i>Paederus littoralis</i> Gravenhorst	Staphylinidae	Rejected - (see Good, 2013)
<i>Pedinus femoralis</i> (Linnaeus)	Tenebrionidae	Rejected - misidentification
<i>Platydracus stercorarius</i> (Olivier)	Staphylinidae	Rejected - misidentification
<i>Pogonus luridipennis</i> (Germar)	Carabidae	Rejected - probable list error
<i>Pterostichus macer</i> (Marsham)	Carabidae	Rejected - error?
<i>Rhagium inquisitor</i> (Linnaeus)	Cerambycidae	Rejected by Haliday
<i>Rhagonycha testacea</i> (Linnaeus)	Cantharidae	Rejected - misidentification



<i>Soronia punctatissima</i> (Illiger)	Nitidulidae	Accepted
<i>Stenolophus teutonius</i> (Schrank)	Carabidae	Rejected - misidentification
<i>Tenebrio molitor</i> Linnaeus	Tenebrionidae	Rejected - Haliday list error
<i>Trachyploeus scabriculus</i> (Linnaeus)	Curculionidae	Rejected - misidentification
<i>Triplax aenea</i> (Schaller)	Erotylidae	Rejected - unverified specimen

**APPENDIX 1.** Details of manuscript catalogues and Tardy collection, used in interpreting Tardy collection Coleoptera records.

There are four manuscript catalogues from the early nineteenth century referring to the Tardy collection, three of which have been discussed in Good and Linnie (1990), but another (4) which requires description here: **(1)** MS catalogue (handwritten by Haliday) - sent to Coulter for revision of the Tardy collection; **(2)** Coulter's annotated copy of Curtis (1837) - annotated by Coulter for DUZM collection; **(3)** Haliday's MS list of Irish insects - Haliday's list which was revised during 1840s and 1850s; and **(4)** Haliday's annotated copy of Curtis (1829) - see below. *Haliday's annotated copy of Curtis (1829)*

There is a copy of Curtis (1829) *Guide to the Arrangement of British Insects*, annotated by Haliday, held in the NMI. This is marked on the cover page as being "with Mr Curtis's best compl[iment]s", and with an annotation in 1923 by A. W. Stelfox (who was then the museum entomologist), which reads in part: "All the MS in this book are in the writing of A.H. Haliday". There is also a Royal Irish Academy "A.H. Haliday Library" stamp. There are two columns of MS markings opposite the list of insect names in this catalogue, the inner with 'o' marks very probably corresponding to the presence of a specimen in the DUZM Curtis collection (see below), and the outer with '+' or 'x' marks corresponding to species which are certainly Irish. While the meaning of these annotations is not mentioned in this catalogue, it is deduced that this is what they represent from Coulter's annotations in his copy of Curtis (1837).

The 'o' marks were deduced as referring to the Curtis collection on the following basis. In 1842, the then Museum curator, Thomas Coulter, purchased a Curtis cabinet of British insects, as well as his own Tardy cabinet of Irish insects, for Dublin University (Nelson, 1983). The Curtis cabinet, a collection of over 7600 specimens, no longer exists in the DUZM (Good and Linnie, 1990). The 'o' marks in the copy of Curtis (1829) do not refer to the Tardy Collection; for instance, only one species of *Philonthus* is represented in the Tardy Collection, whereas 16 species are annotated in the copy of Curtis (1829). Neither do they refer to Haliday's own collection; for instance, *Amara bifrons* Gyl., *Gyrinus marinus* Gyl. and *Ochthebius bicolor*

Germ. are listed as being collected by Haliday in his MS list but are not listed as being in the collection in the 1829 annotated catalogue. There were apparently no other extensive collections with so much English material at the time in Ireland that Haliday would have been involved with. (Although a large insect collection existed in the Royal Dublin Society Museum in the 1820's (O'Connor, 1997), there is no record of Haliday recording its contents systematically).

The Catalogue was not Tardy's MS copy (although Tardy is listed as a subscriber to Curtis (1829)), because a number of species listed as Irish in Haliday's MS list solely from Haliday's own collection are included in the annotations.

However, what is particularly useful about this annotated catalogue is that the '+' or 'x' marks in the second column appear, as pointed out in the cover annotation by Stelfox, to refer to species known to be Irish. The following is a possible explanation as to how this annotated catalogue might have arisen. Valentine Ball, the then DUZM curator (Linnie, 2010), commissioned Haliday to revise the collections in 1847 (Ball, 1847). Apparently, Haliday also returned to work in the University Museum in the 1850s (Nash and O'Connor, 2011). The existing Museum catalogue (Curtis, 1837; i.e. the second edition) had already been annotated by Coulter (see above), and another copy had been cut up for the collection labels, but Haliday may have had available a clean copy of the first edition which was now out of date. As Haliday kept his own MS catalogue, there was no catalogue for the DUZM collections marking those species which were recorded as Irish. Although the catalogue was not up-to-date, it was not that greatly different for Irish species from the second (1837) edition to render it useless. To mark this catalogue, although out-of-date, may have been a pragmatic solution rather than awaiting the purchase of a new one. The annotations in the catalogue clearly were after Haliday had worked through the Tardy collection, as a number of species crossed out in his MS list were not annotated as Irish (*Paederus riparius* is marked Irish instead of *P. littoralis*, for instance, and only subsequently corrected in Haliday's MS list (see Good, 2013)). It therefore probably dates from 1847.

Nevertheless, there are several anomalies in the annotated Curtis (1829) catalogue. *Hydaticus*

*transversalis* F. (Dytiscidae), not marked as certainly Irish in Haliday's MS list is given as Irish; *Clivina collaris* (Carabidae), crossed out and marked as locality doubtful in his MS list is marked Irish; *Dinarda paradoxa* Grav. (Staphylinidae), not mentioned in his MS list, is marked Irish, although subsequently with question marks added; *Amphimallon solstitiale* (Linnaeus) is annotated as Irish (as *Melolontha solstitialis* L.), but crossed out in Haliday's MS list (as *Rhizotragus solstitialis*) and represented by two specimens marked English in the DUZM Tardy collection. Therefore, this annotated catalogue is unreliable as a source of verification for Tardy collection records.

#### *Coulter specimens*

There are two unmarked specimens (i.e. lacking green wax or a green disc) of the cellar-inhabiting carabid *Sphodrus leucophthalmus* (Linnaeus) (under the label '*planus*') in the DUZM Tardy Collection, both pinned through the thorax, in contrast to the Tardy specimens which are pinned through the elytra. These are unlikely to be Tardy specimens. In Haliday's MS list, this species is annotated "Dr Loyd. Malahide" and, subsequently, "R. Ball Dublin". In Coulter's annotated copy of Curtis (1837), this species is marked as "certainly Irish" and "in my collection" [= Tardy Collection], and "Malahide. Dr Lloyd"; one specimen at least is likely to be from Lloyd rather than Ball. Dr Lloyd was Provost of the University of Dublin and apparently a supporter of Coulter in the University (Nelson, 1983); it is likely that this Lloyd specimen was collected before 1838 when Lloyd died and then pinned by Coulter.

In comparison, the DUZM specimens of *Hydrophilus piceus* also have similar pins, without any wax or paper discs, and these are recorded (see results above) as likely Coulter specimens. Also, there is no trace of green wax on the pin-head of the DUZM *Carabus auratus* specimen, which represents a Coulter record (see results above). I do not, therefore, accept the argument that the two *Brachinus crepitans* specimens are Coulter specimens (Coulter reported this species from Co. Louth, according to Haliday's MS list), because the DUZM Tardy collection specimens of these other species which are attributed to Coulter lack green wax on their pin-heads, as well as (in the case of *Sphodrus* and *Hydrophilus*) having a different design of pin.

*Date of Tardy Collection arrangement*

James Tardy died in 1835, and Thomas Coulter acquired the Tardy Collection, probably in 1837 when Tardy's son, Elias, moved to Wexford (Good and Linnie, 1990). Coulter's annotation of his copy of the Curtis (1837) catalogue refers to "Mr. Haliday's manuscript Catalogue (p.p. of July 1838)." This is the MS Catalogue held in the NMI (Ashe, 1986). Haliday's MS Catalogue begins with two, later corrected, entries for *Cicindela* species marked "ta" [= Tardy], so it is very likely that Haliday first went through the collection in 1838, when they were in the possession of Coulter, and when he (Haliday) created his MS list. This correlates with what is known of the whereabouts of both Coulter and Haliday in 1838 (Nelson, 1983; Nash and O'Connor, 2011).

Coulter sold the Tardy Collection to Dublin University in 1842, but died in the subsequent year (Nelson, 1983). Robert Ball, who became the first Director of the Museum (Linnie, 2010), stated in a report in 1847:

"The Tardy cabinet, the principal authority for species published as Irish, has been most carefully and diligently revised by the very distinguished entomologist, A.H. Haliday, Esq., who has added, from his personal knowledge, much information which greatly enhances the value of the collection; he has also, with unexampled kindness and industry for several weeks, brought up the catalogue of Irish insects to the present day" (Ball, 1847).

It thus appears that he revised the collection in 1847, and also his MS list probably using Tardy's MSS. Again in the period 1854 to 1860 he was resident in Dublin and, amongst other activities, curated the insect collections in the DUZM, according to Nash and O'Connor (2011).

It may, therefore, be concluded that the date of the arrangement of the Tardy Collection was in the 1840s and 1850s.

**APPENDIX 2.** Stelfox opinion of Tardy records.

Reviewing Tardy Hymenoptera records, Stelfox (1927) suggested that unlabelled Tardy specimens may have been mistaken as Irish by Haliday:

“It was seldom the custom in those days to label specimens with date or locality, ... unless they were perhaps of foreign origin. Hence *unlabelled* specimens in such collections were supposed to be local captures. It will be seen, therefore, that if a specimen from another country was put into one of these collections, carelessly and without a label, it at once, *ipso facto*, became apparently of Irish origin. Probably most of the errors which have crept into the [Haliday MS] list arose in this manner from unlabelled specimens in the Tardy and Furlong collections ... As proof of this fact, there is now in the National Museum Collection a specimen of *Anthophora* which bears a label in Haliday’s writing, ‘From box 28 where the rest Irish’, and thus, apparently on the strength of this evidence alone, Haliday inserted in his MS Catalogue the statement that *Anthophora pilipes* had certainly been taken in Ireland by Tardy”.

On the specific proof cited by Stelfox concerning the *Anthophora pilipes* specimen, Good and Linnie (1990) argued that Haliday may have been referring to Haliday, and not Tardy, boxes. However, they missed citing the more clear evidence given by Stelfox (1924). Here (p. 21) Stelfox refers to “two females from the Haliday collection and a male and a female from the Trinity College [i.e. Tardy] collection”, and that “One of the Haliday specimens bears a label in Halidays writing “*Anthophora retusa*. 2. From Box 28 where the rest Irish.””. Clearly, the specimen is a Haliday specimen, not a Tardy specimen, and Haliday may have omitted to update his MS list (which has only the original Tardy entry), so the specific proof that this was an unlabelled Tardy specimen is not substantiated.

Nevertheless, Stelfox’s general argument of unlabelled specimens being inadvertently considered Irish if they lacked a label indicating otherwise, requires further consideration. Thomas Coulter’s annotation to his copy of Curtis (1837) states:

“All the specimens in my collection which are not known to be Irish are marked in some way. The English specimens generally with bits of red paper on the pin, under the specimen; or white paper with some no. name, or note. T.C.”

Coulter is referring to the Tardy collection when he says ‘my collection’ (see Good and Linnie, 1990), and it appears that the labelling was exactly as Stelfox described, with Irish specimens being unlabelled. Further evidence is given in the entry in Haliday’s MS list (p. 35), where the annotation opposite *Conpalpus testaceus* reads: “ta coll. marked Irish, 2”, as though this was unusual enough to note.

The question, then, is how did specimens of several Coleoptera species now marked Irish (and considered to be Irish by Coulter), which were subsequently rejected as Irish by Haliday in his MS list, become erroneously marked in the first place. The only probable answer appears to be because, as Stelfox surmised, they were unlabelled English specimens. Because Haliday relied on Tardy MS data to correct records based on falsely marked specimens, where there was confusion with closely related species (e.g. where Tardy recorded *Carabus violaceus* instead of *C. problematicus*) in Tardy’s MS, then falsely marked specimens could have escaped correction.

**THE JUNIPER SHIELDBUG *CYPHOSTETHUS TRISTRIATUS* (FABRICIUS, 1787)  
(HEMIPTERA: ACANTHOSOMATIDAE) IN IRELAND**

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**Abstract**

In Ireland, the juniper shieldbug *Cyphostethus tristriatus* has been discovered on native *Juniperus communis* (L.) in Co. Tipperary and confirmed on a number of Cupressaceae in Co. Dublin.

**Key words:** Acanthosomatidae, *Cyphostethus tristriatus*, juniper, Ireland

**Introduction**

While conducting an informal survey for insects, including shieldbugs, on trees and other vegetation in the campus of University College Dublin at Belfield, Dublin 4 (VC H21), Ireland, the authors were cognisant of the spread of the juniper shieldbug *Cyphostethus tristriatus* (Fabricius, 1787) in Britain from its original host plant of common juniper *Juniperus communis* L. to other conifers mainly in the *Chamaecyparis* genus as summarised by Hawkins (2003). Its recent arrival in Scotland (in 2007) had also been noted (<[www.britishbugs.org.uk](http://www.britishbugs.org.uk)> accessed 17 September 2013). So it was decided to investigate conifers growing on the campus. University College commenced its occupation of this site in the 1960s and supplemented the existing stock by planting of a range of coniferous and deciduous trees. One area which contained a group of Cupressaceae and other conifers was given particular attention.

**Results**

On a visit to University College (O1830) on 8 September 2013, twenty specimens of



*Cyphostethus tristriatus* – 19 adults and one final instar nymph - were beaten in a very short period of time from a single tree whose identity was subsequently confirmed as Nootka cypress *Xanthocyparis (Chamaecyparis) nootkatensis* (Farjon and D. K. Harder) although none had been previously found on the neighbouring *Chamaecyparis lawsoniana* (F. Parlatore) and related species. *X. nootkatensis* is the same conifer species which Southwood (1963) reported as a second host plant for the insect in Britain at Ascot. The six other shieldbug species found in the campus in 2012-2013 were *Acanthosoma haemorrhoidale* (Linnaeus 1758), *Elasmotherus interstinctus* (Linnaeus, 1758), *Elasmucha grisea* (Linnaeus, 1758), *Dolycoris baccarum* (Linnaeus, 1758), *Palomena prasina* (Linnaeus, 1758) and *Pentatoma rufipes* (Linnaeus, 1758). Host plants found for the latter species included alder *Alnus*, birch *Betula*, cotoneaster *Cotoneaster*, hawthorn *Crataegus*, juniper, oak *Quercus* and rowan *Sorbus* subg. *Sorbus*. O'Connor and Nelson (2012) list the existence of 17 species of Pentatomoidea, excluding casuals, in Ireland.

Subsequently, two sites for the native *J. communis* in North Tipperary (VC H10) known to the senior author were visited on 10 September 2013, namely the Commons of Carney (R8791) near Borrisokane and Kilgarvan Quay (R8296) on the shores of Lough Derg. Carney may be described as a fen-turlough where much of the area is inundated until early summer and the site at Kilgarvan is bordering the shores of the lake where the Special Area of Conservation (Cooper *et al.*, 2012) vegetation includes the saw-toothed sedge *Cladium mariscus* Pohl and *J. communis*. At Carney, 13 *C. tristriatus* adults and four nymphs at three different instar development stages were beaten from one large female juniper bush. A brief visit to Kilgarvan Quay late on the same day immediately confirmed the presence of the insect on the first fruiting bush examined.

Further investigations in Dublin City and County (H21) confirmed that the insect was present in the National Botanic Gardens, Glasnevin, Dublin (O1437), on *X. nootkatensis* and *C. lawsoniana* and one adult only was discovered on x *Cuprocyparis notabilis* (Farjon). It is most likely also present on *Thuja plicata* (Donn ex D. Don) trees which are contiguous to *C.*

*lawsoniana* in the Gardens and on a range of other Cupressaceae species and cultivars. At Stillorgan, Co. Dublin (O2328), the insect was beaten from *X. nootkatensis* in a row of Cupressaceae orphaned from the grounds of an adjacent institution by a road development. A number of juniper species in cultivation were investigated in a few sites but most were fruitless or bore a very meagre quantity of berries. *J. communis* is believed to be generally dioecious in Ireland (Parnell and Curtis, 2012) and thus isolated monoecious exotic junipers will lack a partner for fertilization.

## **Discussion**

*Cyphostethus tristriatus* had been previously reported in Ireland from Tollymore Park, Co. Down, by Halbert (1935). Halbert's source of information was Haliday's unpublished manuscript list of insects dated 1902 which is held by the National Museum of Ireland. However, O'Connor and Ashe (1996), prompted by the discovery of single specimen of *C. tristriatus* under *C. lawsonia* in Castleknock, Co. Dublin in 1995, re-evaluated the evidence and concluded that the specimens present in the National Museum of Ireland in the Haliday Collection were assimilated from the collection of James Tardy who died in 1835. Tardy's specimens are considered by O'Connor and Ashe (*op. cit.*) and Good and Linnie (1990) to be from the eastern part of Ireland.

*J. communis* is native to Ireland and is found on both alkaline (limestone) and acid ground, on rocky or heathy coastal and inland areas mainly in the west and north-west (Preston *et al.*, 2002). It is present as two subspecies *communis* and *nana* which may be either prostrate or upright. The former subspecies is present in Co. Tipperary in the upright form. But elsewhere it is often subject to heavy grazing by livestock. It is generally accepted that the *C. tristriatus* feeds on ripe juniper fruits in their second year and on the ripe seeds of Cupressaceae but it seems likely that they must also imbibe plant sap. *Chamaecyparis* species such as *C. lawsonia* have been widely planted throughout Ireland for shelter/privacy and ornamental purposes, *T. plicata* and other *Thuja* species are used for ornamental purposes and sometimes for

afforestation so it would be somewhat surprising if *C. tristriatus* were not now quite widely distributed in Ireland.

However, taking into consideration the fact that *C. chamaecyparis*, *T. plicata* and *X. nootkatenis* were not introduced into cultivation in the British Isles until the mid-1850s (Mitchell, 1978) then clearly the host plant for the Tardy specimens of *C. tristriatus* in Ireland must have then been juniper. Interestingly the nearest known site for native juniper on the east half of the country is in Co. Down and there appear to be no historic records in Leinster despite the fact that juniper was apparently very plentiful in post-glacial Ireland. So the question arises as to whether *C. tristriatus* on juniper evaded rediscovery since the early 19<sup>th</sup> Century and has subsequently colonised exotic Cypresses introduced to Ireland for amenity or commercial purposes. Alternatively has it spread from introduced exotic species to native juniper species in recent decades? Further work is planned to investigate the distribution of *C. tristriatus* on native juniper in Ireland. A specimen from Co. Tipperary has been deposited in the National Museum of Ireland.

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**SOME RECORDS OF CADDISFLIES (TRICHOPTERA) FROM CO. FERMANAGH INCLUDING *HALESUS DIGITATUS*, *LIMNEPHILUS DECIPIENS* AND *CERACLEA FULVA* NEW TO NORTHERN IRELAND**

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**Abstract**

Only five species of caddisfly have been recorded from Co. Fermanagh despite its extensive wetlands. This paper adds another eleven species of which three are also new to Northern Ireland viz. *Halesus digitatus* (Schrank, 1781), *Limnephilus decipiens* (Kolenati, 1848) and *Ceraclea fulva* (Rambur, 1842).

**Key words:** Trichoptera, Northern Ireland, Fermanagh, new records, distribution

**Introduction**

County Fermanagh, known as the Ulster Lakeland and one of the six counties of Northern Ireland, is largely situated in the basin of the River Erne which meanders over the border from Co. Cavan. It gradually widens into the Upper Lough Erne. Downstream, the river flows past Enniskillen and then into the Lower Lough Erne before entering the Atlantic Ocean in Co. Donegal in the Irish Republic. There are numerous other lakes, rivers and streams in the county. Despite this abundance of wetlands, the caddisfly fauna of Co. Fermanagh is poorly known. A total of five species are definitely known from the county. The oldest record is that of *Limnephilus binotatus* Curtis, 1834 from near Enniskillen (King, 1887-1888; King and Halbert,

1910). Subsequently, *Polycentropus flavomaculatus* (Pictet, 1834) and *Sericostoma personatum* (Spence, 1826) were reported by Fahy (1972) probably from the Colebrook River near Maguiresbridge. The cited grid reference appears to be incorrect as it is for an adjoining square. In addition, *Philopotamus montanus* (Donovan, 1813) and *Plectrocnemia geniculata* McLachlan, 1871 have been recorded from caves in the area (Hazelton, 1974a, b).

There may be further records from Fermanagh obtained during the RIVPACS III survey in Northern Ireland (Wright *et al.*, 2000). In that survey, funded by the Department of the Environment for Northern Ireland, macroinvertebrates from 70 running-water sites were identified including Trichoptera. However, the published work gives no details as to where the various species were taken.

The adults were captured by sweeping vegetation with a hand-net, searching crevices in walls and spider webs or by Heath portable light-traps. The sampled areas are shown in Fig. 1. The lake-shores were generally inaccessible due to reed beds growing in a mud substratum but public quays and fishing stands were frequently present and these provided limited access for collecting. All the specimens were identified by the senior author using Mosely (1939), Malicky (1983) and, Barnard and Ross (2012). Voucher specimens of *Halesus digitatus*, *Limnephilus decipiens* and *Ceraclea fulva* will be deposited in the National Museum of Ireland. Unless otherwise stated, Irish distribution information is from O'Connor (1987).

## **The new records from Co. Fermanagh**

### **PSYCHOMYIIDAE**

#### ***Tinodes waeneri* (Linnaeus, 1758)**

Crom Estate H3524, Upper Lough Erne, light-trap ♀ 24 September 2013, KGMB.

A widespread species. In Northern Ireland, *Tinodes waeneri* is known from Cos Antrim, Armagh, Derry and Down (McLachlan, 1885; King and Halbert, 1910; Murphy and Carter, 1984). Also, reported from Northern Ireland by Wright *et al.* (2000).

## LIMNEPHILIDAE

### *Halesus digitatus* (Schrank, 1781)

**New to Northern Ireland**

River Erne (H2637), Cloonatríg, Beallanaleck, light-trap 3♂♂ 9-10 October 2013, JPOC and MAOC; Woodford River (H3419), ♂ 9 October 2013, JPOC and MAOC.

*Halesus digitatus* was discovered in Co. Dublin by Beirne (1939). Since then, it has been collected in five other southern counties (O'Connor, unpublished data).

### *Halesus radiatus* (Curtis, 1834)

Bellanaleck Quay (H2639), Upper Lough Erne, ♂ 10 October 2013, JPOC and MAOC; River Erne (H2637), Cloonatríg, Beallanaleck, light-trap 2♂♂ 9-10 October 2013, JPOC and MAOC; Woodford River (H3419), 7♂♂5♀♀ 9 October 2013, hiding in crevices between the bricks on the outside of a public toilet at the quay, JPOC and MAOC.

A widespread species. In Northern Ireland, *Halesus radiatus* was recorded from Newcastle, Co. Down, by Kimmins (1932).

### *Anabolia nervosa* (Curtis, 1834)

Crom Estate (H3524), Upper Lough Erne, light-trap ♂ 24 September 2013, KGMB; River Erne (H2637), Cloonatríg, Beallanaleck, ♂ 9-10 October 2013, in spider's web, JPOC and MAOC.

A widespread species. In Northern Ireland, *Anabolia nervosa* was recorded from several sites in Co. Armagh by King and Halbert (1910). Also, reported from Northern Ireland by Wright *et al.* (2000).

### *Limnephilus decipiens* (Kolenati, 1848)

**New to Northern Ireland**

Crom Estate (H3524), Upper Lough Erne, light-trap ♂ 24 September 2013, KGMB.

*Limnephilus decipiens* is a rare Irish species. It was discovered by Morton (1892) in two lakes in Co. Monaghan. There are also authentic records from Cos Cavan, Galway and Westmeath (O'Connor, 1987; Hannigan and Kelly-Quinn, 2012).

### *Limnephilus flavicornis* (Fabricius, 1787)

Crom Estate (H3524), Upper Lough Erne, light-trap 2♂♂ 24 September 2013, KGMB.

A widespread species. In Northern Ireland, *Limnephilus flavicornis* was recorded from

several sites in Co. Armagh by King and Halbert (1910). Also, reported from Northern Ireland by Wright *et al.* (2000).

***Limnephilus lunatus* Curtis, 1834**

Crom Estate (H3524), Upper Lough Erne, light-trap ♂2♀♀ 24 September 2013, KGMB; River Erne (H2637), Cloonatrige, Beallanaleck, light-trap 3♂♂ 9-10 October 2013, JPOC and MAOC; Bellanaleck Quay (H2639), Upper L. Erne, ♀ 10 October 2013, JPOC and MAOC.

A widespread species. In Northern Ireland, *Limnephilus lunatus* has been recorded from Cos Antrim, Armagh and Derry (King and Halbert, 1910; Murphy and Carter, 1984). Also, reported from Northern Ireland by Wright *et al.* (2000).

***Limnephilus marmoratus* Curtis, 1834**

Derryallen Lough (H2433), ♂ 10 October 2013, JPOC and MAOC; Bellanaleck Quay (H2639), Upper L. Erne, ♀ 10 October 2013, JPOC and MAOC.

A widespread species. In Northern Ireland, *Limnephilus marmoratus* has been recorded from Cos Antrim and Armagh (King and Halbert, 1910). Also, reported from Northern Ireland by Wright *et al.* (2000).

***Limnephilus nigriceps* (Zetterstedt, 1840)**

Mill Lough near Bellanaleck (H2438), 3♂♂ 9 October 2013, JPOC and MAOC. There are extensive reed beds surrounding the lake.

*Limnephilus nigriceps* was first discovered at Lowry's Lough in Co. Armagh (Johnson, 1893). Since then, there are records from Cos Cavan, Clare, Galway and Westmeath (O'Connor, 1987, Hannigan and Kelly-Quinn, 2012; Drinan, O'Halloran and Harrison, 2013).

***Limnephilus sparsus* Curtis, 1834**

Knockninny Quay (H2731), Upper L. Erne, ♂ 9 October 2013, in spider's web, JPOC and MAOC.

A widespread species. In Northern Ireland, *Limnephilus sparsus* has been recorded from Cos Antrim and Armagh (McLachlan, 1885; King and Halbert, 1910).



## LEPTOCERIDAE

### *Ceraclea fulva* (Rambur, 1842)

New to Northern Ireland

Crom Estate (H3524), Upper Lough Erne, light-trap 2♂♂ 24 September 2013, KGMB.

A widespread species. *Ceraclea fulva* has been recorded from the adjoining southern counties of Cavan and Monaghan (King and Halbert, 1910; O'Connor and Bracken, 1978) and its discovery in Fermanagh is therefore unsurprising.

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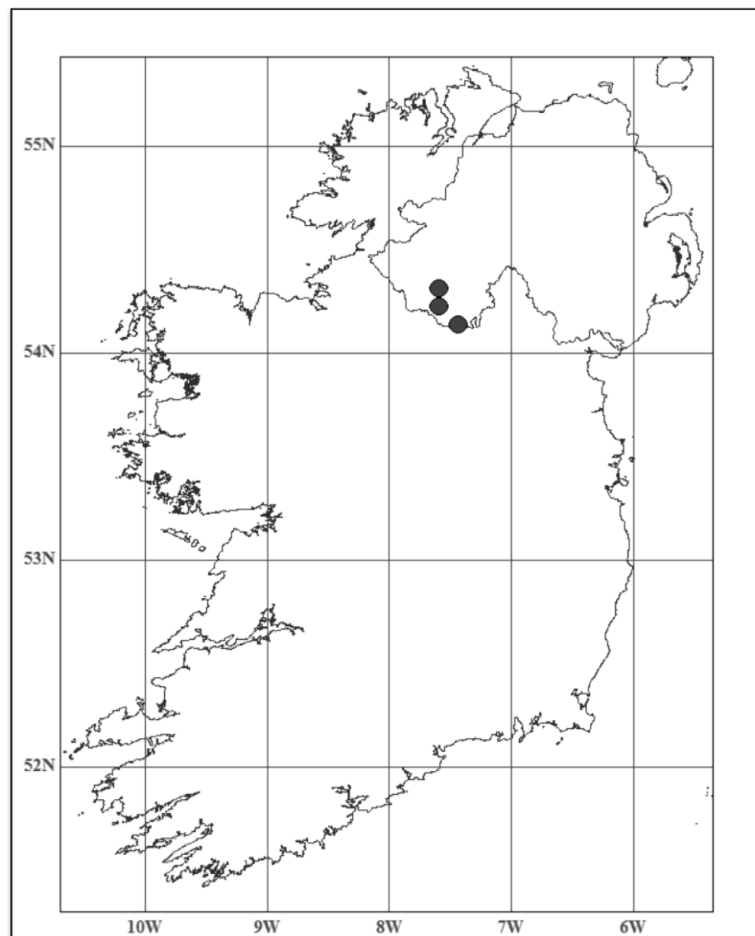
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**FIGURE 1.** The locations of the collecting sites.



**SPIDERS (ARANEAE) OF IRISH RAISED BOGS: CLARA BOG, CO. OFFALY AND  
CARROWBEHY BOG, CO. ROSCOMMON**

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**Abstract**

The spider (Araneae) fauna from wet and swampy areas of two Irish raised bogs, Carrowbehy Bog, Co. Roscommon and Clara Bog, Co. Offaly was inventoried over a seven month period in 2007 for their spider fauna. Similarities and differences between the sites are discussed. The pitfall samples were dominated in Clara by wetland species, in Carrowbehy by a range of web-building and wetland spiders. Sweep-net samples are found to differ less than pitfall samples. Much of the site differences can be explained through vegetation structure, preferred micro-habitat of species and latitude. Clara Bog was surveyed again in 2010 when a central, *Sphagnum* rich, very swampy area and a marginal area subject to drainage were sampled. Pitfall and sweep samples are compared and the latter again found to differ less than the former. Faunal differences between the two locations are discussed. The dominant species recorded in the swampy area in 2007 were largely dominant again in 2010. The fauna recorded in the drained area differed strongly from the swampy location and was dominated by a range of species, some of which are very common, some quite uncommon and none of which are wetland specialists. Species additional to the 2007 survey are noted. Clara Bog is found to play host to a wide range of rare and uncommon spider species. All tables follow after the text/references section. New county records are indicated in Appendices 1, 2 and 3 with an asterisk.

**Key words:** Araneae, spiders, Ireland, raised bogs

### **Study sites 2007**

*Carrowbehy Bog, Co. Roscommon (candidate SAC) (M564837)*

Dominated by heather *Calluna vulgaris* and *Cladonia* lichen on hummocks and an extensive network of tear pools, frequently with relatively deep (>30cm) open water and a very soft 'muddy' bottom. Tear pools were elongate, sinuous and ran roughly parallel to the northern edge of the bog on an east/west axis. Pools were characterised by thick algal mats that had often sunk beneath the surface water and allowed subsequent development of floating *Sphagnum* moss.

*Clara Bog, Co. Offaly (Nature Reserve) (N245305)*

Dominated by inundated *Sphagnum* lawn with relatively little hummock development. Small plants of *Calluna* and a thin sward of cross-leaved heath *Erica tetralix* and white beak-sedge *Rhynchosporon alba* occurred throughout. Some traps were set at the edge of the swampy area where the sward was dominated by deergrass *Trichophorum caespitosum*. *Calluna* and *Erica* and swampy *Sphagnum* was missing. Small pools of open water occurred not far from the trap site, often hidden by overhanging vegetation.

### **Site vegetation at both sites**

A range of typical bog species were noted and were relatively common at both sites:- bog asphodel *Narthecium ossifragum*, bogbean *Menyanthes trifoliata*, common sundew *Drosera rotundifolia*, oblong-leaved sundew *Drosera anglica*, white-beak sedge, bog cottons *Eriophorum* spps and deergrass. Smaller amounts of bog rosemary *Andromeda polifolia* and cranberry *Vaccinium oxycoccus* were also seen.

### **Methods 2007**

Site visits are detailed in Table 1.

#### *Pitfall-traps*

20 pitfall traps were set at each site on 10 and 11 April 2007 using plastic catering cups and

Corriboard covers held in place by 4 inch nails. Pure ethylene glycol diluted 50:50 with water was used as a killing/preserving agent. The traps were emptied and replaced on each subsequent visit. Traps were removed from each site on 12 and 13 October. At Clara, traps were scattered rather randomly around the study area with no trap being less than one metre from an adjacent trap. At Carrowbehy, they were set in two rough lines with traps about one to two metres apart. Some traps were set in *Sphagnum* lawn and to prevent these being buoyed up by the high water level, a long nail was hooked over the cup rim and inserted sideways deep into local vegetation. This technique was quite effective. A number of traps at each site were flooded in July but this did not affect the catch too adversely. The water level was very high at Clara throughout August and at this time, all the traps were completely flushed of specimens that they might have caught.

#### *Sweep-net*

From 2 and 3 May onwards, three sweep-net samples were taken at each site on the dates given in Table 1. Each sample consisted of 3 transects of 20 sweeps with 3 strokes to each sweep – 180 strokes in all. The sweep transects extended at both sites beyond the area where the pitfall traps were set.

#### *Hand-collecting*

Between 60 and 90 minutes of hand-collecting were carried out at each site during each visit. This included the direct examination of taller vegetation, grubbing through vegetation at ground surface and sieving of mosses and *Cladonia* lichens.

### **Results 2007**

In total 3870 specimens were collected of which 1791 were adult and 2179 immature. About 200 immature specimens could not be identified to species. In all 91 species were recorded, 70 from Carrowbehy Bog and 62 from Clara Bog. At Carrowbehy Bog, 27 species were recorded that did not occur at Clara Bog while 19 occurred at Clara and not at Carrowbehy. A total 31 species are new county records for Co. Roscommon (Carrowbehy Bog) and fourteen for Co. Offaly (Clara Bog). A full list of species and numbers of adults (male/female) collected through

the period of the survey is given in Appendices 1 and 2 and new county records are indicated there with an asterisk\*. County records were assessed by summarising data from Helsdingen (1996), Cawley (2009) and a small number of subsequently published papers.

Two species were at the time new to Ireland, *Minicia marginella* (Wider, 1834) and *Walckenaeria alticeps* (Denis, 1952) while a third had been only recently recorded from another bog in Ireland *Hypsosinga albovittata* (Westring, 1851). These finds have been published (Nolan, 2007a, 2009).

A number of species recorded are known from five or fewer Irish counties (including this survey): *Hahnia pusilla* C. L. Koch, 1841 (2 counties); *Gongylidiellum latebricola* (O. P.-Cambridge, 1871) (5 counties); *Jacksonella falconeri* (Jackson, 1908) (5 counties); *Meioneta beata* (O. P.-Cambridge, 1906) (3 counties); *M. marginella* (1 county); *M. mossica* Schikora, 1993 (2 counties); *Satilatlas britteni* (Jackson, 1913) (4 counties); *Pirata latitans* (Blackwall, 1841) (2 counties); *P. uliginosus* (Thorell, 1856) (5 counties); *Porrhomma montanum* Jackson, 1913 (3 counties).

Of these species, *M. marginella*, *S. britteni*, *J. falconeri* and *M. beata* are considered rare at an European level. Also recorded and considered rare or uncommon at European level were *Araeoncus crassiceps* (Westring, 1861) (16 counties) and *Bathyphantes setiger* F. O. P.-Cambridge, 1894 (8 counties).

### **Pitfall data 2007**

The dominant species recorded at both sites are shown in Table 2. Only one species appeared in abundance at both sites, *Pirata uliginosus* (Thorell, 1856). This species has a preference for humid, not wet, areas of wetland and moist meadow. Harvey *et al.* (2002) suggest that the species prefers rank, grassy and drying bog, however, this really does not match with either Clara or Carrowbehy bogs despite their both being subject to management and cutting for some years. It is rather restricted in habitat in Ireland where it was first noted 40 years ago (Bailey, 1973) and is frequent on raised bogs. A recent survey showed it to be very widespread

(Oxbrough, 2008) and recorded it from some planted woodland sites, most of which were originally peatland. *G. latebricola* constituted over 2% of the Clara catch and over 5% at Carrowbehy; this species has a northern distribution across Europe where it occurs usually in moist woodlands. In Ireland, however, it seems to occur in greatest abundance on raised bog and other peat habitats. It is not uncommon across its European range and has now been recorded from nine Irish counties, six of which are recent (Johnston and Cameron, 2002; Cawley, 2008; Oxbrough, 2008). Most records are from peatlands and plantation forest sites on peat or wet grasslands.

Clara and Carrowbehy otherwise showed marked differences in the most abundant species trapped in pitfalls (Table 3). Clara Bog reveals its inundated nature in the prevalence of *Antistea elegans* (Blackwall, 1841) and *Pirata piscatorius* (Clerck, 1757), two explicit wetland species which constituted 38.52% of the pitfall catch there. The former is a common species but the latter has a distinctly local distribution in north western Europe where it occurs almost exclusively on very wet areas of bog and fen with small pools of open water. There are relatively few Irish records and it was most recently recorded by Nelson (2005) from three fen areas in Northern Ireland. Previously, Helsdingen (1998) collected it at Scragh Bog, Co. Westmeath. At Carrowbehy, *P. piscatorius* constituted a small proportion (1.67%) of the pitfall catch however its presence is still significant. *S. britteni* is a rare spider associated also with wetlands, however it may be under-recorded due to the early mating period (mid April/early May). A large number of specimens (n=27) were easily collected by hand on 11 April at Clara where they were running over *Sphagnum* lawn. A small number of specimens were collected by hand at Carrowbehy but none in pitfalls. Until recently it had been known from only two Irish counties, however, Oxbrough (2007) recorded it from three western counties on blanket bogs in association with wet *Sphagnum* and *Molinia*. Contrasting with other Irish records of the species, Cawley (2004) collected it from saltmarsh in Co. Waterford - a habitat in which it is known to occur elsewhere.

The most commonly trapped species at Carrowbehy strongly indicate for relatively dense



heathy vegetation. Three small linyphiid spiders, *Lepthyphantes ericaeus* (Blackwall, 1853), *Walckenaeria cuspidata* Blackwall, 1833 and *Lepthyphantes mengei* Kulczynski, 1887 together constituted 28.79% of the total pitfall catch. These species are web-builders who need well-structured vegetation to set their webs and occur in a wide range of habitats. Their abundance in the pitfall traps is probably due to activity related to reproductive behaviour. *L. mengei* is the less common of the three and has a significant association with less densely developed heathlands (McFerran *et al.*, 1995). While the pitfall catch was dominated by these species, the presence of *P. piscatorius* and *A. elegans* even in relatively small numbers strongly indicate the wetland nature of the habitat.

Other noteworthy species include *J. falconeri*, a species considered endangered in Britain (Dawson *et al.*, 2008). Most Irish records are relatively recent and include records from drying raised bog (Cawley, 2004; Nolan, 2007b) and gravels and acid grassland in upland and montane situations (McCormack *et al.*, 2006). It occurs in other habitats across its range but is considered rare in Europe where it is largely confined to north-western Europe and Fennoscandia. *Trichopterna thorelli* (Westring, 1861) occurred in numbers on both sites, is relatively uncommon across its range and is considered Vulnerable in Britain (Dawson *et al.*, 2008). *M. beata* is almost certainly under-recorded in Ireland. It is widely distributed in Britain but rather scattered in north-western Europe where it is not recorded from quite a few countries. Irish records are from peat and heath habitats and it was quite numerous in a plantation on peatland in Co. Donegal (Oxbrough, 2008). *M. mossica* was recently added to the Irish list (Nolan and McCormack, 2004) from mountain habitats above 600m. It preferentially sets small sheet-webs very low down on the surface of wet vegetation. Seven specimens of the species were recorded from Carrowbehy Bog while none were taken at Clara. There are a small number of unpublished records of the species, all from the west of Ireland. It has a boreal distribution in north-western Europe (Schikora, 1993, 1995) and is essentially confined to the western half of Britain. Its non-occurrence at Clara Bog might be considered significant especially when one considers that it likes to set webs low on *Sphagnum* mosses. *P. montanum* was also recently

added to the Irish fauna (Nolan, 2002) and is widespread across Ireland occurring in upland and lowland situations. Also not occurring on Clara Bog were *Bathyphantes setiger* F. O. P.-Cambridge, 1894 (8 counties) and *Erigonella ignobilis* (10 counties). While both are widespread, *B. setiger* is uncommon across its limited European range and usually found in association with bog and fen habitat. Both are wetland species and have Vulnerable status in Britain (Dawson *et al.*, 2008).

### **Sweep-net data 2007**

A total of 175 adults and 1021 immatures were collected. The most abundant from each site are detailed in Table 2. Three web-building species from three different families were the most abundant at each site: *Hypsosinga pygmaea* (Sundevall, 1832), *Tetragnatha extensa* (Linnaeus, 1758) and *Dictyna arundinacea* (Linnaeus, 1758). Including immature specimens, these three species composed 76.23% of specimens swept at Carrowbehy and 85.01% of those swept at Clara. *Neottiura bimaculatum* (Linnaeus, 1767) was collected at Clara in numbers equal to *H. pygmaea* but it is far more abundant in the southern half of Ireland and would not be expected at Carrowbehy in large numbers if at all.

Of the most abundant species caught using the sweep-net, only *T. extensa* is a strong wetland associate. *D. arundinacea* occurs abundantly on heaths and has a strong preference for the dry, dead, or non-flowering twiggy heads of woody or rigid vegetation. The spider's abundance at Clara may be related to the very high water level checking the ability of *Calluna* to flower and thus in turn provide a greater abundance of potential nesting sites. The species was far less abundant at Carrowbehy Bog where *Calluna* grew more extensively, however the plant was in general higher and drier on the well-developed hummock system and flowering may have been easier. *H. pygmaea* occurs in a variety of generally open, heath and grassland habitats, and occurred in abundance at both sites. While fairly widespread through Ireland, it is not common and there are only two recent records (Oxbrough, 2007; Cawley, 2009). The abundance in which it appeared at Carrowbehy is certainly noteworthy. It occurs also on calcareous

grasslands and seems to be more abundant in the northern half of the country. Some of the less common and rare species swept were *Agalenatea redii* (Scopoli, 1763), *H. albobittata* and *M. marginella*. These represent a small suite of species that are generally thermophilous throughout their range. *M. marginella* throughout central and southern continental Europe tends to associate more commonly with open grasslands, however in Atlantic, Scandinavian and Baltic countries it occurs most commonly in mire systems. The species seems not to be resident in Britain. The fact that all specimens were swept at Clara shows that it has a strong preference for the upper areas of vegetation. This species is now known to have breeding populations on a number of other midlands raised bogs in Ireland (unpublished information).

### **Species absence/presence 2007**

Of those species occurring only at Clara, three have a southern distribution in Ireland and Britain and thus would not be expected at Carrowbehy: *Agelena labyrinthica* (Clerck, 1757), *N. bimaculatum* and *Hahnina pusilla* C. L. Koch, 1841. Of these *H. pusilla* is generally uncommon, the other two common.

Two species were recorded at Carrowbehy and not at Clara probably through under-sampling: *Dolomedes fimbriatus* (Clerck, 1757) (Pisauridae) and *Argyroneta aquatica* (Clerck, 1757) (Cybaeidae). The former is strongly - the latter explicitly - associated with bodies of open water on bogs. *D. fimbriatus* ambushes aquatic prey from the edges of open pools while *A. aquatica* lives almost its entire life history under-water, constructing a chamber under submerged vegetation in which it resides.

The single greatest difference in the faunas recorded from the two locations was in the number of recorded species of Linyphiidae, 29 from Clara and 40 from Carrowbehy. Examination of Appendices 1 and 2 reveals a great similarity in the numbers and composition of species in other families recorded at both sites. The abundance of linyphiid species at Carrowbehy is undoubtedly related to the tall and well-developed vegetation there. Species from the genus *Agyneta*, *Gonatium rubens* (Blackwall, 1833), *Lepthyphantes obscurus* (Blackwall,

1841), *M. prominulus*, *Micrargus herbigradus* (Blackwall, 1854), *Saaristoa abnormis* (Blackwall, 1841) and *Taranucnus setosus* (O. P.-Cambridge, 1863) all build sheet webs and prefer to set them under or among well-developed vegetation that provides good shade; between them, they added substantially to the numbers of linyphiid specimens recorded. *T. setosus* in particular has a strong preference for very well-shaded and moist situations and is considered uncommon/rare across its European range. Some of the specimens obtained were found when lids covering pitfall traps were removed and the species was seen to have set a web over the cup below.

Thus the presence/absence of many species recorded from only one of either sites can be explained. Many of the others are essentially common species and occurred at either site only in very small numbers. No particular reason as to why they should not occur at both sites can be put forward but some of them certainly can be considered visitor species i.e. they would not preferentially breed on raised bog habitat. Species such as *Erigone atra* Blackwall, 1833 (both sites), *Erigone dentipalpis* (Wider, 1834) (Clara only) and *Pachygnatha degeeri* Sundevall, 1830 (Clara only) are all very common grassland species that disperse vigorously by ballooning and thus may occur in a very wide number of habitats but should not be considered resident.

### **Clara Bog 2010**

This bog was sampled again in 2010 as part of a study of six raised bogs in Co. Offaly which took a novel, predictive approach to surveying and which will be reported on separately.

#### *Sampling methods*

Pitfall traps (as described above) were set in two locations; in a ‘central’ *Sphagnum* rich, swampy area (N242303) and a ‘marginal’ area (N240298) 500m from the ‘central’ site and about 20m away from the cutaway margin. The marginal location was chosen randomly with the sole condition that it was a distance of 500m from the central location and near to cutaway bog. It was also proximate to a parking area. The terms ‘central’ and ‘marginal’ will be used in the discussion of the 2010 results to refer to these two locations. At each location, 20 traps were set

in two lines of ten traps with traps two metres apart. The marginal traps were set broadly parallel to the cutaway edge of the high bog. Traps were set for two periods; 30 April - 27 May 2010 and 27 May - 25 June 2010. Sweep-net samples, consisting of two transects of twenty sweeps (three strokes to a 'sweep' - 120 strokes in all), were taken at each location on 30 April and 27 May 2010. Specimens were occasionally collected by hand but no other systematic sampling was carried out.

#### *Sampling locations*

The central location was characterised by an extensive area of very wet *Sphagnum* lawn with little hummock development. Patches of *Calluna* were present and a thin sward of bell-heather, cross-leaved heath and white beak-sedge occurred throughout. Small pools of open water also occurred throughout. The range of plant species noted from 2007 were recorded again and species such as *Menyanthes* were more abundant. The marginal site was significantly drier and was dominated by medium to tall *Calluna* and substantial amounts of bog myrtle *Myrica gale*, especially on the more elevated areas. Tall grasses and deergrass were also present. The substrate was densely carpeted with grasses and mosses. A large pool, largely in-filled with mosses was present about ten metres from the trap site, and seems to have been created by a now in-filled drainage ditch carrying water from a more central area of the bog.

#### **Results 2010**

Altogether, 1500 specimens were collected and a full tabulation of species and numbers collected is given in Appendix 3. Of these, 1380 were adult, 1156 from pitfall traps and 224 swept. Of the pitfall catch, 438 specimens, representing 33 species, were caught at the central sampling location and 718 specimens, representing 58 species were caught at the marginal location; nineteen species were common to both locations. Of the swept catch, 114 were caught at the centre, representing 12 species and 110 at the margin, representing 18 species; nine species were common to both locations. 81 species were recorded in total, 50 of which had been recorded in 2007. Of the additional 31 species recorded in 2010, five were taken only at the

central location, twenty only at the marginal areas and six at both; 21 were collected solely in pitfall traps, four solely by sweeping and six by both methods. Immatures in the swept catch were also assessed and this added a further 120 specimens to the collection. Eleven species are new county records.

As was stated above, a full analysis of data collected during the 2010 survey will be presented elsewhere. Comments here will therefore briefly address the major differences between the catch at the two locations on Clara Bog, differences between the pitfall and swept catch and then detail those species that were not collected at Clara in 2007.

### **Noteworthy species 2010**

Many of the rare/uncommon species recorded in 2007 were collected again in 2010; *H. albovitata*, *J. falconeri*, *M. marginella*, *S. britteni*, *W. alticeps* and *P. piscatorius*. Some of these were collected in smaller numbers than in 2007 but this is certainly related to the later trapping season and absence of hand-collecting in the case of *S. britteni* and the lesser sweep effort in the case of *H. albovitata* and *M. marginella*.

In addition to these, especially noteworthy from the 2010 survey, is the second Irish record of the rare linyphiid spider *Centromerus levitarsis* (Simon, 1884). This spider has been only recorded once previously in Ireland, from Pollardstown Fen (Helsdingen, 1997). It is considered endangered in Britain (Dawson *et al.*, 2008) and rare across Europe where it occurs also in humid mosses in forest. Also noteworthy is *Simitidion simile* (C. L. Koch, 1836), a spider whose presence in Ireland was confirmed only recently (Cawley, 2004) and has been recorded in Ireland only from heath on bogs. The jumping spider *Sitticus caricis* (Westring, 1861) has been previously noted in Ireland from only two counties although there are a few unpublished records. It is usually found in wetland habitats, especially *Carex* fen (Helsdingen, 1998) but occurs with some regularity on raised bog across its range. *Walckenaeria dysderoides* (Wider, 1834) was quite recently recorded for the first time in Ireland from forest habitat (Fahy and Gormally, 2003) but is now known from similar habitat in eleven counties (Cawley, 2004;

Oxbrough, 2008).

### **Pitfall and sweep-net data 2010**

A comparison of Tables 2 and 4 shows that those species that dominated the pitfall catch in 2007 also dominated the similarly swampy central location in 2010 with *P. piscatorius*, *A. elegans* and *P. uliginosus* constituting the most abundant species. The differing proportions can be to some extent explained by the appearance in late summer 2007 of large numbers of males of *A. elegans*. The abundance of the hygrophilous *Diplocephalus permixtus* (O. P.-Cambridge, 1871), and the greater numbers of *P. piscatorius*, reflect the more heavily inundated nature of the trap location in 2010 compared with 2007. The dominant species swept at centre in 2010 were equally similar to those collected in 2007 with *D. arundinacea*, *T. extensa*, *H. pygmaea* and *N. bimaculatum* again constituting by far the greater proportion of the catch (Tables 3 and 5).

A very substantial difference is seen between the fauna collected in pitfall traps at the two locations. Two of the dominant species are very common wolf-spiders from the genus *Pardosa*. These species occur in a wide range of dry, open habitats and it will be noted that they were practically absent from the central area. At the margin, seventeen species were recorded that were not collected at the centre by any means, nor at the margin by sweeping. The most significant aspect influencing the species present is certainly the structure and shade offered by the heathy *Calluna* and *Myrica*. The abundant presence of *L. mengei* and *Episinus angulatus* Blackwall, 1836 is a good indicator of well-developed heath. The presence of *J. falconeri* in very large numbers (n=229) at the margin is unusual to say the least - I am not aware of its occurrence in such abundance elsewhere. It is probably indicative of the well-developed humid mosses that carpeted the area and given that the species is rather uncommon, is very noteworthy. The fact that no females were recorded suggests they are essentially sedentary through the adult period. It should be noted also that if this abundance is anomalous, and were not sustained, then the relative proportions of the very common species that also dominated marginally rises significantly. It is somewhat odd that *Silometopus elegans* (O. P.-Cambridge, 1872) occurred

only at the margin of the bog. It was relatively abundant at Clara in 2007 and it occurs in both wet and very humid habitats. Its presence too would seem to confirm the high humidity at ground level at the margin. Also of interest, is the presence at the margin of *Walckenaeria antica* (Wider, 1834), a species very closely related to *W. alticeps*. The species are very similar and great care is needed in distinguishing between them. The presence of both species on the bog but at very distinct locations tells us something of their preferences. *W. antica* is found in a range of moist and humid habitats in Ireland while *W. alticeps* has only been recorded from very wet areas of raised bogs. *C. arcanus*, *Ceratinella brevis* (Wider, 1834) and *W. dysderoides* are generally woodland species - their occurrence may be due to the location's proximity to the patch of birch *Betula* woodland on the bog. It is of interest that *M. marginella* was found to occur also at the marginal area of the bog. It is thus more widespread on the bog than the 2007 records indicate and its presence raises the question as to whether it is there due to the wetland component close by, as with *inter alia* *P. piscatorius* or, because it is essentially a thermophile species since it can make use of non-swampy areas of the bog. If the latter is the case, it raises the question as to whether it occurs on other, dryer habitats in Ireland.

The most interesting additions from a conservation perspective did come from the central area of the bog despite the fact that this area produced only five species not recorded in 2007 or at the marginal location in 2010. It says something about the significance of Clara Bog that species of such rarity continue to appear.

Twelve species were recorded in 2010 that were recorded at Carrowbehy in 2007 but not at Clara. This reduces the number of species recorded at Carrowbehy but not Clara from 27 to fifteen. Of these twelve, two were from the central area, and one of these, *Lophomma punctatum* (Blackwall, 1841), is a strong wetland associate. Two other species were found at both locations and eight occurred only at the marginal location. Of these eight, seven were Linyphiidae and this points to the effect the taller, shading and well-structured vegetation at the marginal area has in creating resemblances to Carrowbehy.



## Conclusions

The 2007 and 2010 surveys produced between them 93 species from Clara Bog, a little over 22% of the known Irish spider fauna. Should the birch woodland on the bog be sampled, the number would certainly rise to over 100 and probably above one-quarter of the Irish fauna could be recorded.

The survey in 2010 largely reinforces the picture of the varied and interesting spider fauna that is attached to Clara Bog. Quite apart from recording again a number of rare species it added records of more rare species e.g. *C. levitarsis* and others considered quite uncommon such as *S. caricis* and *S. simile*.

The picture that one receives of the marginal area is not by any means entirely negative in spite of the abundant presence of some very common species of wolf-spider and linyphiid. While the central area had a greater number of rare species both in proportion to the number of specimens recorded centrally and in proportion to the number of species recorded from the margin, the examined marginal area clearly also harbours rare and significant species. A number of factors may explain this, principally, the fact that despite the proximity of the location to the edge of the cutaway bog, it manages to retain a very high degree of humidity - in part perhaps a consequence of water-flow into the area through the now in-filled drains. The high humidity, and thus the carpeting mosses, is probably maintained to some extent by the tall heath vegetation in the area. The presence of a single specimen of *P. piscatorius* and four specimens of *A. elegans* in the marginal pitfalls is considered significant here as is the abundant population of *J. falconeri*.

A number of species might be considered indicators for wet, peat-forming areas of midlands raised bog: *W. alticeps*, *S. britteni* and *P. piscatorius*. The former, at present, is known to occur in Ireland only in association with this habitat while the latter two also occur in acid fen (*P. piscatorius*) and a very restricted range of other flushed habitats (*S. britteni*). A range of other species are known in Ireland at present only from raised bog habitat but, due to their association with low to tall herbaceous field-layer vegetation may prove to be more elastic in their habitat

associations: *M. marginella*, *H. albovittata* and *S. simile*. It is undoubtedly the case that, regardless of whether all of the above species are found to occur in other habitats, Clara Bog has maintained substantial reproducing populations in spite of the severity of peat extraction practises.

Carrowbehy Bog has also maintained an interesting suite of rare wetland species including some of those noted as potential indicators above. Species such as *B. setiger*, *E. ignobilis*, *J. falconeri*, *M. mossica* and *P. montanum* are all relatively uncommon on a European scale. The large population of *H. pygmaea* is also of significant interest given that the grassland habitats which it frequents have been so heavily managed in Ireland. Raised bogs in the more northern parts of the Republic of Ireland have been very little studied for their spider fauna and it is not possible to know how representative Carrowbehy may be of them as a whole.

The major differences between the wettest areas of Clara and Carrowbehy bogs can be largely explained by the taller and denser vegetative structure and more northern latitude of the latter. The major differences between the central area and the marginal area of Clara can be explained by dehydration at the margin and its well-structured vegetation. The swampy parts of Clara Bog especially maintain a spider fauna of significant interest and a randomly selected marginal area on the high bog, despite its proximity to cutaway margin, also maintains a number of uncommon species. Viewed negatively, the marginal area sampled at Clara Bog can be seen to have essentially lost its strictly wetland component through the near total loss of species such as *Pirata* spp., *S. britteni* and *A. elegans*. Giving the most positive reading, it might be suggested that even small, wet areas can maintain small numbers of some wetland, epigeal species and also, populations of rare or uncommon species that favour more elevated situations. It would be of interest to see if this holds true for other marginal locations on Clara Bog and whether in 2010, the presence of local ditches and pools (on the high bog) and the *Myrica/Calluna* vegetation created results that might be anomalous in comparison. Cutaway bog is hugely variable in nature, and very difficult to define (Fossitt, 2000), and high bog proximate to cutaway margin will be, inevitably, highly variable also, depending on the history of peat-

extraction and management practises locally.

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**TABLE 1.** Dates that pitfall traps were set and catch collected in 2007. Hand-collecting and sweep-netting was carried out at each site on the date the pitfalls were emptied.

Dates used in appendices.	Mid April	Early May	Late May	Late June	Late July	Early Sept	Mid Oct
Clara	11 April	3 May	25 May	28 June	31 July	7 Sept	12 Oct
Carrowbehy	10 April	2 May	26 May	27 June	30 July	8 Sept	13 Oct

**TABLE 2.** Dominant species in pitfall traps at Clara Bog and Carrowbehy Bog, 2007 (>3% of total catch from each site) showing total numbers and percentage of pitfall catch.

Species	CLARA		CARROWBEHY	
	Adults	% total	Adults	% total
<i>Antistea elegans</i>	188	34.49	25	4.13
<i>Pirata uliginosus</i>	102	18.71	77	12.74
<i>Lepthyphantes ericaeus</i>	3	<2%	94	15.56
<i>Pardosa pullata</i>	11	2.01	40	6.62
<i>Walckenaeria cuspidata</i>	1	<2%	49	8.11
<i>Gongylidiellum latebricola</i>	14	2.56	28	4.63
<i>Pirata piraticus</i>	8	<2%	30	5.96
<i>Pirata piscatorius</i>	22	4.03	10	<2%
<i>Pardosa nigriceps</i>	15	2.75	16	2.64
<i>Ozyptila trux</i>	8	<2%	21	3.47
<i>Lepthyphantes mengei</i>			29	4.8
<i>Trochosa terricola</i>	12	2.2	12	<2%
<i>Euryopis flavomaculata</i>	18	3.30	4	<2%
<i>Walckenaeria atrotibialis</i>	15	2.75	5	<2%
<i>Agyneta olivacea</i>			21	3.47
<i>Satilatlas britteni</i>	19	3.48		

**TABLE 3.** Dominant species in sweep-net samples at Clara Bog and Carrowbehy Bog, 2007 (>2% of total catch from each site) showing adult and immature numbers and percentage of pitfall catch.

	Clara Bog				Carrowbehy Bog			
	Adults	Imms	total	% total	Adults	Imms	Total	% total
<i>Dictyna arundinacea</i>	84	569	653	68.37	5	63	68	20.35
<i>Tetragnatha extensa</i>	6	119	125	13.08	4	82	86	25.74
<i>Neottiura bimaculatum</i>	4	30	34	3.57				
<i>Hypsosinga pygmaea</i>	5	29	34	3.56	15	91	106	31.73
<i>Minicia marginella</i>	6	22	28	2.93				
<i>Xysticus cristatus</i>	1	21	22	2.31	2	16	18	5.38
<i>Tibellus sp</i>		7	7	.73		7	7	2.09

**TABLE 4.** Clara Bog, Co. Ofally, 2010. Most abundant species (>3%) in pitfalls at central and marginal locations as % of catch trapped at each location.

	Central	Marginal
<i>Pirata piscatorius</i>	36.75	<1
<i>Jacksonella falconeri</i>		31.89
<i>Antistea elegans</i>	21	<1
<i>Pirata uliginosus</i>	15.29	3.62
<i>Diplocephalus permixtus</i>	11.41	
<i>Pardosa nigriceps</i>	<2	9.61
<i>Gongylidiellum latebricola</i>		5.29
<i>Pardosa pullata</i>		5.15
<i>Lepthyphantes mengei</i>		4.59
<i>Neon reticulatus</i>	<1	3.48
<i>Pirata piraticus</i>	3.42	

**TABLE 5.** Most abundant species (>3%) swept at central and marginal locations as % of total catch swept at each location.

	<b>Central</b>	<b>Marginal</b>
<i>Dictyna arundinacea</i>	40.38	45.74
<i>Theridion</i>	3.84	17.02
<i>Tetragnatha extensa</i>	16.02	2.12
<i>Hypsosinga pygmaea</i>	14.10	<2
<i>Neottiura bimaculatum</i>	8.33	2.12



**APPENDIX 1.** Clara Bog, Co. Offaly, 2007. Each date represents specimens collected by hand and sweep-net on that date and by pitfalls in the period up to that date. New county records indicated \*.

Species	11 Apr	3 May	25 May	28 June	30 July	8 Sept	13 Oct	Total
<b>AGELENIDAE</b>								
* <i>Agelena labyrinthica</i> (Clerck)	Immatures only							
<b>ARANEIDAE</b>								
* <i>Agalenatea redii</i> (Scopoli)	Immatures only							
<i>Araneus quadratus</i> Clerck							0/1	0/1
<i>Hypsosinga albobittata</i> (Westring)	Immatures only							
<i>Hypsosinga pygmaea</i> (Sundevall)		0/4	1/0		0/1			1/5
<i>Larinioides cornutus</i> (Clerck)							0/2	0/2
<b>CLUBIONIDAE</b>								
<i>Clubiona trivialis</i> C.L.Koch	2/0			0/1	5/0	0/3		7/4
<b>DICTYNIDAE</b>								
<i>Dictyna arundinacea</i> (Linnaeus)		11/5 4	3/13	0/12	0/8	0/1		14/88
<b>GNAPHOSIDAE</b>								
* <i>Haplodrassus signifer</i> (C.L.Koch)				1/0				1/0
<b>HAHNIIDAE</b>								
<i>Antistea elegans</i> (Blackwall)	0/2	0/67	0/33	0/21	3/7	2/7	73/8	78/14 5
* <i>Hahn timer pusilla</i> C.L.Koch	0/1	0/1		0/1	1/2			1/5
<b>LINYPHIIDAE</b>								
* <i>Aphileta misera</i> (O.P.- Cambridge)	2/2	1/1	0/1	3/0	1/3			7/7
<i>Araeoncus crassiceps</i> (Westring)	2/0							2/0
<i>Bathypantes gracilis</i> (Blackwall)		1/0					4/3	5/3
* <i>Centromerita concinna</i> (Thorell)			0/1					0/1

APPENDIX 1 (Continued)

Species	11 Apr	3 May	25 May	28 June	30 July	8 Sept	13 Oct	Total
<i>Ceratinella brevipes</i> (Westring)			1/0					1/0
<i>Ceratinella brevis</i> (Wider)		2/2	1/0	1/2				4/4
<i>Diplocephalus permixtus</i> (O.P.- Cambridge)		1/4			0/1			1/5
<i>Erigone atra</i> Blackwall		0/1		0/1			1/0	1/2
<i>Erigone dentipalpis</i> (Wider)	0/1							0/1
<i>Erigonella hiemalis</i> (Blackwall)		1/0						1/0
<i>Gongylidiellum latebricola</i> (O.P.-Cambridge)		2/0	1/2	10/0	1/0			14/2
<i>Gongylidiellum vivum</i> (O.P.- Cambridge)			1/0					1/0
<i>Jacksonella falconeri</i> (Jackson)		7/0	2/0					9/0
<i>Lepthyphantes ericaeus</i> (Blackwall)		0/1	0/1	0/1				0/3
<i>Lepthyphantes tenuis</i> (Blackwall)	0/1	0/3	1/1	0/2			2/3	3/10
<i>Lepthyphantes zimmermanni</i> Bertkau							1/0	1/0
* <i>Meioneta beata</i> (O.P.- Cambridge)			1/0					1/0
<i>Minicia marginella</i> (Wider)		2/4						2/4
<i>Oedothorax retusus</i> (Westring)		1/0						1/0
<i>Peponocranium ludicrum</i> (O.P.- Cambridge)	3/0	4/1	0/3					7/4
<i>Pocadicnemis pumila</i> (Blackwall)			2/1	0/2				2/3
* <i>Satilatlas britteni</i> (Jackson)	19/ 8	1/14	0/16	0/2				20/40
<i>Silometopus elegans</i> (O.P.- Cambridge)	1/0	2/5	0/3	0/1				3/9
* <i>Stemonyphantes lineatus</i> (Linnaeus)	0/1							0/1

APPENDIX 1 (Continued)

Species	11 Apr	3 May	25 May	28 June	30 July	8 Sept	13 Oct	Total
<i>Trichopterna thorelli</i> (Westring)		0/1	2/1	0/2				2/4
<i>Walckenaeria alticeps</i> (Denis)	2/0	1/2	0/2	0/3	0/1			3/8
* <i>Walckenaeria atrotibialis</i> (O.P.-Cambridge)				5/6	1/3			6/9
* <i>Walckenaeria cuspidata</i> Blackwall		1/0						1/0
<i>Walckenaeria vigilax</i> (Blackwall)				2/0	1/0			3/0
<b>LIOCRANIDAE</b>								
<i>Agroeca proxima</i> (O.P.- Cambridge)		0/1						0/1
<i>Scotina gracilipes</i> (Blackwall)					1/0	0/1		1/1
<b>LYCOSIDAE</b>								
<i>Alopecosa pulverulenta</i> (Clerck)			1/0	1/0				2/0
<i>Pardosa nigriceps</i> (Thorell)		4/1	7/4	3/1				14/6
<i>Pardosa pullata</i> (Clerck)		2/1	5/4		0/2	0/1		7/8
<i>Pirata latitans</i> (Blackwall)				0/1				0/1
<i>Pirata piraticus</i> (Clerck)		0/1	1/3	12/14	1/5	0/1		14/24
* <i>Pirata piscatorius</i> (Clerck)		2/0	10/2	6/1	0/1	0/2		18/6
<i>Pirata uliginosus</i> (Thorell)		6/2	65/6	23/6	0/3			94/17
<i>Trochosa terricola</i> Thorell	0/1	3/3	0/1	0/2	0/3	1/0	1/0	5/10
<b>MIMETIDAE</b>								
* <i>Ero cambridgei</i> Kulczynski							0/1	0/1
<b>PHILODROMIDAE</b>								
<i>Tibellus oblongus</i> (Walckenaer)			1/0	1/0				2/0
<b>SALTICIDAE</b>								
<i>Neon reticulatus</i> (Blackwall)		3/0	2/2	0/4	1/1			6/7
<b>TETRAGNATHIDAE</b>								
<i>Pachygnatha degeeri</i> Sundevall		1/1	1/0					2/1
<i>Tetragnatha extensa</i> (Linnaeus)			1/0	5/2		0/2		6/4
<b>THERIDIIDAE</b>								
<i>Euryopsis flavomaculata</i> (C.L.Koch)			9/1	7/1	0/1			16/3

APPENDIX 1 (Continued)

Species	11 Apr	3 May	25 May	28 June	30 July	8 Sept	13 Oct	Total
<i>Neottiura bimaculatum</i> (Linnaeus)		0/2	2/0	1/4	1/1			4/7
* <i>Robertus arundineti</i> (O.P.- Cambridge)		1/0						1/0
<i>Robertus lividus</i> (Blackwall)				1/0	1/0			2/0
<i>Theridion impressum</i> L. Koch					0/2	0/1		0/3
<b>THOMISIDAE</b>								
<i>Ozyptila trux</i> (Blackwall)	0/1	1/1	1/3	7/0	0/1			9/6
<i>Xysticus cristatus</i> (Clerck)		2/1	2/1	1/0				5/2

**APPENDIX 2.** Carrowbehy Bog, Co. Roscommon, 2007. Each date represents specimens collected by hand and sweep-net on that date and by pitfalls in the period up to that date.

New county records indicated \*.

Species	10 Apr	2 May	26 May	27 June	30 July	8 Sept	13 Oct	total
<b>ARANEIDAE</b>								
<i>Araneus quadratus</i> Clerck						0/1		0/1
* <i>Hypsosinga pygmaea</i> (Sundevall)	0/1	2/8	1/5	0/4				3/18
<i>Larinioides cornutus</i> (Clerck)				0/1				0/1
<b>CLUBIONIDAE</b>								
* <i>Clubiona trivialis</i> C.L.Koch			1/1	1/1		1/0		3/2
<b>CYBAEIDAE</b>								
* <i>Argyroneta aquatica</i> (Clerck)		0/1		2/1	2/0	2/0		6/2
<b>DICTYNIDAE</b>								
<i>Dictyna arundinacea</i> (Linnaeus)		0/4	0/1	0/5	0/2	0/1		0/13
<b>GNAPHOSIDAE</b>								
* <i>Drassodes cupreus</i> (Blackwall)		1/0		0/1	0/1	0/1		1/3
<b>HAHNIIDAE</b>								
* <i>Antistea elegans</i> (Blackwall)		0/5	0/3	0/1	0/1	16/0	1/0	17/10
* <i>Hahnia helveola</i> Simon			0/1					0/1
<b>LINYPHIIDAE</b>								
* <i>Agyneta conigera</i> (O.P.- Cambridge)			0/6	2/0				2/6
* <i>Agyneta olivacea</i> (Emerton)		2/1	10/7	3/5		0/1		15/14
* <i>Agyneta subtilis</i> (O.P.- Cambridge)				4/0	1/0			5/0
* <i>Aphileta misera</i> (O.P.- Cambridge)			2/1	0/1		0/1		2/3
<i>Bathyphantes gracilis</i> (Blackwall)		2/2	0/1	0/2		0/1	2/0	4/6
* <i>Bathyphantes setiger</i> F.O.P.- Cambridge				0/1				0/1
<i>Centromerus dilutus</i> (O.P.- Cambridge)		0/2						0/2

APPENDIX 2 (Continued)

Species	10 Apr	2 May	26 May	27 June	30 July	8 Sept	13 Oct	total
<i>Ceratinella brevipes</i> (Westring)		0/4						0/4
<i>Diplocephalus permixtus</i> (O.P.- Cambridge)		0/1						0/1
<i>Erigone atra</i> Blackwall		1/0		5/1	0/1			6/2
<i>Erigonella ignobilis</i> (O.P.- Cambridge)		1/0						1/0
<i>Gonatum rubens</i> (Blackwall)		0/4	0/3	0/2				0/9
* <i>Gongylidiellum latebricola</i> (O.P.-Cambridge)		1/0	13/3	9/1	5/0			28/4
<i>Gongylidiellum vivum</i> (O.P.- Cambridge)			0/1	1/0				1/1
<i>Hypomma bituberculatum</i> (Wider)		1/1						1/1
* <i>Jacksonella falconeri</i> (Jackson)		4/0	2/0					6/0
<i>Lepthyphantes ericaeus</i> (Blackwall)	0/1	2/24	3/16	8/18	5/15	1/11		19/85
<i>Lepthyphantes mengei</i> Kulczynski		1/3	2/8	3/2	2/9	0/3		8/25
<i>Lepthyphantes obscurus</i> (Blackwall)		2/0	2/0					4/0
<i>Lepthyphantes tenuis</i> (Blackwall)		1/0	1/2	0/1				2/3
<i>Lepthyphantes zimmermanni</i> Bertkau				0/1				0/1
* <i>Lophomma punctatum</i> (Blackwall)		0/1						0/1
* <i>Meioneta mossica</i> Schikora			3/1	1/1	0/3	0/1		4/6
* <i>Metopobactrus prominulus</i> (O.P.-Cambridge)		1/0	1/1	0/2				2/3
<i>Micrargus herbigradus</i> (Blackwall)		3/1	1/2	0/4	4/1			8/8
* <i>Oedothorax fuscus</i>					1/1			1/1
<i>Oedothorax gibbosus</i> (Blackwall)				8/0				8/0

APPENDIX 2 (Continued)

Species	10 Apr	2 May	26 May	27 June	30 July	8 Sept	13 Oct	total
<i>Peponocranium ludicrum</i> (O.P.- Cambridge)		2/5	0/1		0/1			2/7
<i>Pocadicnemis pumila</i> (Blackwall)			1/1					1/1
<i>Poeciloneta variegata</i> (Blackwall)		0/1						0/1
* <i>Porrhomma montanum</i> Jackson			0/1					0/1
<i>Saaristoa abnormis</i> (Blackwall)				4/2	2/1			6/3
* <i>Satilatlas britteni</i> (Jackson)	1/0		0/1					1/1
* <i>Silometopus elegans</i> (O.P.- Cambridge)				0/1				0/1
<i>Taranucnus setosus</i> (O.P.- Cambridge)	0/1	0/2	1/3	0/1	0/2	0/2		1/11
* <i>Trichopterna thorelli</i> (Westring)		1/0	0/3					1/3
<i>Walckenaeria acuminata</i> Blackwall		0/1	0/1		1/0			1/2
<i>Walckenaeria atrotibialis</i> (O.P.- Cambridge)				0/1	2/2			2/3
<i>Walckenaeria cuspidata</i> Blackwall	0/1	4/10	1/12	0/15	0/4	0/2	1/1	6/45
<i>Walckenaeria nudipalpis</i> (Westring)						0/1		0/1
<b>LIOCRANIDAE</b>								
* <i>Agroeca proxima</i> (O.P.- Cambridge)						2/0		2/0
* <i>Scotina gracilipes</i> (Blackwall)				0/1		4/0		4/1
<b>LYCOSIDAE</b>								
* <i>Alopecosa pulverulenta</i> (Clerck)			3/7		0/2			3/9
* <i>Pardosa nigriceps</i> (Thorell)	1/1	3/1	7/3	1/9	0/3	0/2		12/19
<i>Pardosa pullata</i> (Clerck)		6/10	3/12	1/5	1/5	1/2		12/34
<i>Pirata piraticus</i> (Clerck)		1/1	4/3	23/9	2/2	0/1		30/16
* <i>Pirata piscatorius</i> (Clerck)		1/0	4/2	2/0	0/1	0/1		7/4

APPENDIX 2 (Continued)

Species	10 Apr	2 May	26 May	27 June	30 July	8 Sept	13 Oct	total
<i>*Pirata uliginosus</i> (Thorell)		2/2	39/7	18/6	0/1	0/4		59/20
<i>Trochosa terricola</i> Thorell		0/3			0/1	1/5	2/0	3/9
<b>MIMETIDAE</b>								
<i>*Ero cambridgei</i> Kulczynski			0/1					0/1
<b>PHILODROMIDAE</b>								
<i>*Tibellus oblongus</i> (Walckenaer)			0/1					0/1
<b>PISAURIDAE</b>								
<i>Dolomedes fimbriatus</i> (Clerck)		1/0	1/0					2/0
<b>SALTICIDAE</b>								
<i>Neon reticulatus</i> (Blackwall)			0/1					0/1
<b>TETRAGNATHIDAE</b>								
<i>Tetragnatha extensa</i> (Linnaeus)				0/4	1/2			1/6
<b>THERIDIIDAE</b>								
<i>*Euryopsis flavomaculata</i> (C.L.Koch)				1/0	2/0	1/0		4/0
<i>Pholcomma gibbum</i> (Westring)	0/3	1/1	1/1	0/1				2/6
<i>Robertus lividus</i> (Blackwall)				0/1				0/1
<i>*Theridion impressum</i> L.Koch							0/1	0/1
<b>THOMISIDAE</b>								
<i>Ozyptila trux</i> (Blackwall)			2/4	12/1	0/1		0/1	14/7
<i>Xysticus cristatus</i> (Clerck)		2/0			0/1	1/0		3/1
<b>ZORIDAE</b>								
<i>*Zora spinimana</i> (Sundevall)			1/1	1/0	0/1			2/2



**APPENDIX 3.** Clara Bog, Co. Offaly, 2010. Species and numbers of specimens (♂/♀). Each column amalgamates specimens from the two collecting periods and dates. Numbers without a slash (/) indicate immatures. Species/genera in bold were not recorded in 2007. New county records indicated \*.

Species	Pitfall Central	Sweep Central	Pitfall Marginal	Sweep Marginal
<b>Araneidae</b>				
<i>Agalenatea redii</i> (Scopoli)				1/1
<i>Araneus quadratus</i> Clerck				7
<b>Araniella</b>				
<i>Hypsosinga albovittata</i> (Westring)		1		1
<i>Hypsosinga pygmaea</i> (Sundevall)		6/16		1/1
<i>Larinioides cornutus</i> (Clerck)		4		1
<b>Zygiella?</b>				
				1
<b>Clubionidae</b>				
<i>Clubiona</i>		1		3
<i>Clubiona trivialis</i> C.L.Koch			0/1	0/1
<b>Dictynidae</b>				
<i>Dictyna arundinacea</i> (Linnaeus)		30/33		38/48
<b>Gnaphosidae</b>				
* <i>Drassodes cupreus</i> (Blackwall)	1/0		1/0	
<i>Haplodrassus signifer</i> (C.L.Koch)			2/0	
<i>Micaria pulicaria</i> (Sundevall)			1/2	
<b>Hahniidae</b>				
<i>Antistea elegans</i> (Blackwall)	0/92		0/4	
* <i>Hahnna helveola</i> Simon			0/3	
<b>Linyphiidae</b>				
<i>Aphileta misera</i> (O.P.-Cambridge)	1/0			
<i>Bathyphantes gracilis</i> (Blackwall)	1/1		0/1	
<i>Centromerita bicolor</i> (Blackwall)			0/2	
<i>Centromerita concinna</i> (Thorell)			0/12	
* <i>Centromerus arcanus</i> (O.P.- Cambridge)			4/1	
* <i>Centromerus levitarsis</i> (Simon)	0/1			
* <i>Centromerus prudens</i> (O.P.- Cambridge)			0/11	
<i>Ceratinella brevis</i> (Wider)	0/1		13/4	
<i>Ceratinella brevipes</i> (Westring)	1/1			
<i>Diplocephalus permixtus</i> (O.P.- Cambridge)	15/35			
<i>Erigone atra</i> Blackwall	1/0			

APPENDIX 3 (Continued)

Species	Pitfall	Sweep	Pitfall	Sweep
	Central	Central	Marginal	Marginal
<i>Gonatium rubens</i> (Blackwall)			0/2	0/1
<i>Gongylidiellum latebricola</i> (O.P.- Cambridge)			35/3	
<i>Gongylidiellum vivum</i> (O.P.- Cambridge)	1/0		11/0	
<i>Jacksonella falconeri</i> (Jackson)			229/0	
<i>Lepthyphantes ericaeus</i> (Blackwall)			1/0	
<i>Lepthyphantes menzei</i> Kulczynski			12/21	
<i>Lophomma punctatum</i> (Blackwall)	0/1	0/1		
<i>Maso sundevalli</i> (Westring)			2/0	
<i>Meioneta beata</i> (O.P.-Cambridge)			9/0	
* <i>Metopobactrus prominulus</i> (O.P.- Cambridge)			0/3	
<i>Micrargus herbigradus</i> (Blackwall)	1/0		2/1	
<i>Microlinyphia</i>		2		4
<i>Microlinyphia pusilla</i> (Sundevall)				0/1
<i>Minicia marginella</i> (Wider)		0/1		0/2
<i>Monocephalus fuscipes</i> (Blackwall)			2/2	
<i>Oedothorax fuscus</i> (Blackwall)	1/0			
<i>Peponocranium ludicrum</i> (O.P.- Cambridge)	2/0		1/3	0/2
<i>Pocadicnemis pumila</i> (Blackwall)	2/0		4/0	
<i>Saaristoa abnormis</i> (Blackwall)			1/0	
<i>Satilatlas britteni</i> (Jackson)	0/2			
<i>Silometopus elegans</i> (O.P.-Cambridge)			3/17	
<i>Tallusia experta</i> (O.P.-Cambridge)	0/1			
<i>Tiso vagans</i> (Blackwall)			2/0	
<i>Trichopterna thorelli</i> (Westring)	1/0			
<i>Walckenaeria acuminata</i> Blackwall			0/1	
<i>Walckenaeria alticeps</i> (Denis)	4/1			
<i>Walckenaeria antica</i> (Wider)			4/5	
<i>Walckenaeria atrotibialis</i> (O.P.- Cambridge)	0/1		10/9	
<i>Walckenaeria cuspidata</i> Blackwall			0/1	
* <i>Walckenaeria dysderoides</i> (Wider)			8/1	
<i>Walckenaeria nudipalpis</i> (Westring)			0/4	
<i>Walckenaeria vigilax</i> (Blackwall)	4/2		10/1	
<b>Liocranidae</b>				
<i>Agroeca proxima</i> (O.P.-Cambridge)			0/1	
<i>Scotina gracilipes</i> (Blackwall)			0/4	

APPENDIX 3 (Continued)

Species	Pitfall Central	Sweep Central	Pitfall Marginal	Sweep Marginal
<b>Lycosidae</b>				
<i>Alopecosa pulverulenta</i> (Clerck)			7/4	
<i>Pardosa amentata</i> (Clerck)			1/1	
<i>Pardosa nigriceps</i> (Thorell)	5/1		43/26	
<i>Pardosa pullata</i> (Clerck)			16/21	
<i>Pirata latitans</i> (Blackwall)	1/0			
<i>Pirata piraticus</i> (Clerck)	8/7			
<i>Pirata piscatorius</i> (Clerck)	136/25		1/0	
<i>Pirata uliginosus</i> (Thorell)	62/5		23/3	
<i>Trochosa terricola</i> Thorell	0/1		0/2	
<b>Philodromidae</b>				
<i>Philodromus cespitum</i> (Walckenaer)				1/0
<i>Philodromus</i>		2		6
<i>Tibellus</i>		1		
<b>Pisauridae</b>				
<i>Dolomedes fimbriatus</i> (Clerck)	1/0	1		2
<b>Salticidae</b>				
* <i>Heliophanus flavipes</i> (Hahn)				1/0
<i>Neon reticulatus</i> (Blackwall)	1/0		5/20	
* <i>Sitticus caricis</i> (Westring)		0/1		
<b>Tetragnathidae</b>				
<i>Metellina?</i>		1		8
<i>Pachygnatha degeeri</i> Sundevall	0/1		3/4	
<i>Tetragnatha extensa</i> (Linnaeus)		10/15		1/3
<b>Theridiidae</b>				
<i>Enoplognatha</i>				10
* <i>Episinus angulatus</i> (Blackwall)		1/0	8/3	0/1
<i>Euryopis flavomaculata</i> (C.L.Koch)	3/0		3/0	
<i>Neottiura bimaculatum</i> (Linnaeus)		13	1/3	2/2
<i>Robertus arundineti</i> (O.P.-Cambridge)			2/7	
<i>Robertus lividus</i> (Blackwall)	1/1		6/5	
* <i>Simitidion simile</i> (C.L.Koch)		1		1
<i>Theridion</i>		6		32
<i>Theridion sisyphium</i> (Clerck)				0/1
<b>Thomisidae</b>				
<i>Ozyptila trux</i> (Blackwall)	3/0		10/5	
<i>Xysticus cristatus</i> (Clerck)	0/1			0/1
<i>Xysticus</i>				2
<b>Total species</b>	34	18	52	28
<b>Total specimens</b>	438	156	718	188

**SUPPLEMENTARY RECORDS OF *METRIOCNEMUS (INERMIPUPA) CARMENCITABERTARUM* LANGTON AND COBO, 1997 (DIPTERA: CHIRONOMIDAE) IN IRELAND WITH SOME OBSERVATIONS ON LARVAL BEHAVIOUR**

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**Abstract**

New distribution records of *Metriocnemus (Inermipupa) carmencitabertarum* from Ireland are given along with brief comments on larval habitat and behaviour.

**Key words:** Chironomidae, *Metriocnemus (Inermipupa) carmencitabertarum*, Ireland, distribution, larvae, habitat, behaviour

**Introduction**

Langton and Cobo (1997) erected the subgenus *Inermipupa* within *Metriocnemus* (Orthoclaadiinae) and described all life history stages of *Metriocnemus (Inermipupa) carmencitabertarum* from specimens obtained in Spain and Portugal. Pupal exuviae from Portugal had been known since 1989 and the taxon was included in the key to pupal exuviae of the west Palaearctic region by Langton (1991). Murray *et al.* (2004) provided the first record outside the Iberian Peninsula from the Atlantic island of Terceira in the Azores Archipelago. More recently Ramos *et al.* (2010) reported a second Azorean record from Santa Maria island. Evidence for a more northerly European mainland distribution is provided by the documented records from 2011 in the Netherlands by Kuper and Moller Pillot (2012) while records from England in 2010 (Langton, 2012) and from Ireland in 2012 (Murray, 2012) demonstrate a

broader distribution. The unusual and characteristic pupal exuviae are easily recognisable (to the naked eye) and since it was not recorded in the author's extensive collections in Ireland spanning a period of almost 50 years, the finding in 2012 suggest that the species is a recent arrival in Ireland. Casual observations since the first finding have yielded additional records at other locations in Ireland which are documented below.

### **New Irish distribution records**

Since the first Irish records from Co. Meath in March and April 2012, the species has been found at six additional locations in counties Dublin, Meath and Wicklow. Records are of observations and/or collection of pupal exuviae (Pe) or adult (Im) insects. The abbreviation "HA" refers to the Hydrometric Area (see <[www/epa.ie](http://www/epa.ie)>). The Irish Grid reference of each location is given in parentheses. All Irish records to date have been from anthropogenic microhabitats in which natural rainwater has accumulated such as: rainwater barrel, tank, garden bird-bath, cistern, tin can, jar, discarded cooking pot and old motor tyres.

**DUBLIN: HA 9** – small rain-filled tank on roof of Science Centre West, University College Dublin, Belfield (O182301), 7 August 2013, Pe, Im.

**MEATH: HA 7** – rainwater accumulation in a disused milk churn, Riverstown, Kilmessan (N892595), Pe, Im, 27 March and 9 April 2012, (Murray, 2012) with additional records from 15 August 2013; rainwater in discarded motor tyres and plastic bucket, The Zone Karting Centre, Mullaghboy Industrial Estate, Navan (N853668), Pe, Im, 18 June, 25 August, 8 September, 20 October and 24 October 2012 and 2 May 2013; rainwater in bucket and cistern at Huckleberry's Den, Mullaghboy Industrial Estate, Navan (N857668), Pe, Im, 2 May 2013; rainwater in an abandoned kayak, Ardsallagh, Navan (N896635), Pe, 17 November 2012; rainwater in small basin, Bellinter (N890626), Pe, Im, 18 June and Pe, 18 October 2012: **HA 8** – miscellaneous rainfilled containers (barrell, small bucket, cooking pot, plastic tray etc.) in yard, Meadesbrook, Kilmoon, Ashbourne (O040594), Pe, Im, 28 June, 17 September and 14 November 2012, also 13 April, 27 April, 3 May, 15 July, 23 June, 6 and 15 August, 21 September and 27 October

2013.

**WICKLOW: HA 10** – garden bird-bath, Hillside, Greystones (O291122), Pe, Im, 4, 15, 21 June and 3 July 2013.

### **Some casual observations on larval behaviour**

The fortuitous finding of the species in small rainwater filled containers at the rear of the author's home has provided an opportunity for casual observations on larval behaviour between May and October 2013. Living larvae are generally dark brown / black in colour and are free-living epiphytic feeders. While occasionally they move through the water by a typical undulating movement, larvae more generally remain on the hard substratum and exhibit rapid directed movement crawling in a straight line along horizontal and vertical surfaces apparently feeding on epiphytic algae. Earlier instar larvae remain completely submerged. Fourth instar larvae tend to migrate along the sides of the containing vessel to the surface water and have frequently been observed to temporarily assume a "hygropetric" existence at the water's edge. Where water was gently overflowing from a small barrel following recent rainfall, larvae were observed to migrate upwards on the inner vertical wall of the barrel and congregate in the film of overflowing water on the lip of the barrel, occasionally travelling a short distance downwards in the water film whilst feeding on surface algae growing on the outer surface of the barrel. These larvae were also observed to move vertically upwards on the outer wall of the barrel against the water flow to return to the main body of water. A population of *Chironomus luridus* Strenzke, 1959 co-existed with *M. carmentitabertarum* during the period of observation. In earlier years successive generations of *C. luridus* and *Psectrocladius limbatellus* (Holmgren, 1869) were regularly observed in the same outdoor containers but during 2013 *P. limbatellus* was apparently absent.

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**DISTRIBUTION RECORDS OF IRISH CHIRONOMIDAE (DIPTERA): PART 1 -  
BUCHONOMYIINAE, PODONOMINAE, TANYPODINAE, TELMATOGETONINAE,  
DIAMESINAE AND PRODIAMESINAE**

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**Dedication**

The senior author dedicates this work to the memory of E. J. Fittkau, 1927-2012, mentor, colleague and friend.

**Abstract**

The present work is the first of three papers dealing with records and distribution data for the species-level taxa of Chironomidae currently known to occur in Ireland. Distribution data has been compiled from a variety of sources but the majority of records cited have not been published previously. This paper, Part 1, contains approximately 4,360 records of 84 species in the subfamilies Buchonomyiinae, Podonominae, Tanypodinae, Telmatogetoninae, Diamesinae and Prodiamesinae. It is dedicated to the memory of E. J. Fittkau, 1927-2012.

**Key words:** Chironomidae, Buchonomyiinae, Podonominae, Tanypodinae, Telmatogetoninae, Diamesinae and Prodiamesinae, Ireland, records, distribution



## **Introduction**

The most recent checklist of Irish Diptera includes 472 species of Chironomidae (Chandler *et al.*, 2008). Since then additional records of species new to the Irish fauna have been provided by Langton (2012a, b), Murray (2007, 2010, 2012a, b, c) and Murray and O'Connor (2012) but limited published information is available on the distribution throughout the country of all species known from Ireland. There has been no attempt to compile distribution data on a countrywide basis since the listing 40 years ago by Murray (1972) which is now outdated. The present work is the first of three papers dealing with records and distribution data for the species-level taxa of Chironomidae currently known to occur in Ireland. Distribution data has been compiled from a variety of sources but the majority of records cited have not been published previously. This paper, Part 1, contains approximately 4,360 records of 84 species in the subfamilies Buchonomyiinae, Podonominae, Tanypodinae, Telmatogetoninae, Diamesinae, and Prodiamesinae. Parts 2 and 3 of this work will provide data for species in the subfamilies Orthocladiinae and Chironominae respectively.

The stimulus for the current work stems from extensive information gathered during two Heritage Council of Ireland supported projects awarded to the senior author in the years 2004 and 2005. The first project was undertaken to compile a revised checklist and a slide-mounted reference collection of reliably identified chironomid species known from Ireland (Murray, 2005). The species checklist from that project was incorporated into the annotated checklist of Irish Diptera by Chandler *et al.* (2008) and the voucher reference collection is deposited in the National Museum of Ireland. The aim of the second project was to assemble data on the known occurrence and distribution of Chironomidae in Ireland (Murray, 2006a). Some 12,000 records of 497 species were assembled from published information and records in the personal collections of the senior author since the mid 1960s and from his directed research with undergraduate and postgraduate masters, and doctoral students in a variety of “grey-literature” reports and unpublished theses at University College Dublin. Other records were sourced from theses in University College Cork (Morgan, 1982), University of Ulster (McLarnon, 1997) and

National University of Ireland, Galway (Fahy, 2002). That data was submitted on CD-ROM to the Heritage Council of Ireland, Kilkenny (Murray, 2006). The records from those projects are incorporated into the present work. A wealth of additional countrywide data has been derived from further studies, including results of examination by the senior author of almost 110,000 chironomid pupal exuviae collected from Irish lakes by field research staff of the Environmental Protection Agency between 2006 and 2009 for CPET analyses (**Chironomid Pupal Exuviae Technique** – Wilson and Ruse, 2005) as part of the Agency’s Lakes Monitoring Programme under the EU Water Framework Directive. Combined with personal unpublished and published records by the second author in Northern Ireland over the last decade the entire database (as of September 2013) contains 21,800 records of some 533 species-level taxa (including ten unique pupal exuviae morphotypes) for Ireland – including some off-shore islands.

### **Record citation format**

The taxonomic sequence of subfamilies and genera follows Ashe and O’Connor (2009, with updated phylogeny in 2012) and species are documented alphabetically within genus. The status of some genus-group taxa is based on nomenclatural changes made in Cranston and Epler (2013). Distribution records for each species are presented in a format which facilitates study by political County (Fig. 1) and Hydrometric Area (Fig. 2). County names are given in bold capital font and Hydrometric Areas are identified by the relevant Hydrometric Area number (**HA ##**), also in bold font. Forty hydrometric areas are recognized on the island of Ireland by agreement between agencies in Northern Ireland and the Republic of Ireland. Each Hydrometric Area comprises a single large or a group of smaller river basins, including their neighbouring coastal areas. These Hydrometric areas are numbered from 1 to 40 beginning at the Foyle Catchment and proceeding in a clockwise direction around the island (see <[www.epa.ie](http://www.epa.ie)> for further details of hydrometric areas). International and local political (county) borders rarely coincide with river catchment boundaries and species records in many counties may belong to different hydrometric areas. Complementary distribution information provides the water body name, district and/or collection site, Irish Grid Reference (in parentheses) given as letter and six figure

number where possible, date(s) of record, collector and source of record (in parentheses). If the source is a publication, thesis or report, it is cited by author and year. Where the source is a personal unpublished record by the collector/determinator then his/her initials are given in parentheses and the “collector” entry is omitted to avoid unnecessary duplication. Where the source is attributed to a multi author citation this is preceded by the initials of the collector/determinator.

### **Abbreviations used in the text**

AHH - A. H. Haliday; AF – A. Fitzgerald; AJOS - A. J. O'Sullivan; BC - B. Connolly; BH - B. Healy; BK - B. Kennedy; BPH - B. P. Hayes; CAD - C. A. Duigan; CB - C. Bradley; CCO - C. C. Omoku; CD - C. Dowling; CFH - C. F. Humphries; CNP - Connemara National Park; COK - C. O'Keefe; CP - C. Plant; DAM - D. A. Murray; DEM - D. E. Morgan; d/s – downstream; DJD - D. J. Douglas; EF - E. Fahy; EMcE - E. McEntee; EPA - Environmental Protection Agency; FC - F. Curran; FWE – F. W. Edwards; GF - G. Free; GM - G. Morgan; GNP - Glenveagh National Park; GO - G. Oliver; GPF - G. P. Forde; GW – G. Walton; HA – Hydrometric Area; HD - H. Daoud; IFT - Inland Fisheries Trust; JB - J. Bracken; JC - J. Casey; JNH – J. N. Halbert; JL - J. Lynch; LMcl – L. Mc Larnon; JPOC - J. P. O'Connor; JR - J. Reynolds; JRB - J-R. Baars; KB - K. Bond; KC - K. Clabby; L - Lough; LF - L. Finnegan; LJH - L. J. Heneghan; MB - M. Berrigan; MC - M. Carroll; MG - M. Grey; MH - M. Holmes; MJC - M. J. Costello; MKQ - M. Kelly-Quinn; MK - M. Kennedy; MOG - M. O'Grady; MS - M. Sommerfield; Mt – Mountain / Mount NH - N. Hackett; NMI - National Museum of Ireland; NOM - N. O'Maoilideigh; PG - P. Gargan; PHG - P. H. Grimshaw; PHL - P. H. Langton; PJA - P. J. Ashe; PMcC - P. McCreesh; POD - P. O'Dwyer; PS - P. Sweeney; R - River; RF - R. French; RH - R. Hernan; RL - R. Little; SC - S. Collins; SF - S. Fahy; SMcB - S. McBean; SR - S. Reilly; SW - S. Wistow; TOF - T. O'Flaherty; UCD - University College Dublin; u/s - upstream; UU - University of Ulster; WM - W. Murray; WEF - W. E. Frost; WMNP - Wicklow Mountains National Park; WT - W. Trodd.

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## **SUBFAMILY BUCHONOMYIINAE**

### ***Buchonomyia thienemanni* Fittkau, 1955**

**CARLOW: HA 12** - R. Slaney, Kilcarrig Bridge (S893624), 28 July 1981 (Hayes, 1991).

**CORK: HA 18** - R. Blackwater, Killavullen (W648998), 31 August 1981 (Hayes, 1991).

**KERRY: HA 22** - R. Clydagh, u/s Clydagh Bridge (W114826), 10 August 1978 (Ashe, 1982).

R. Flesk, Garries Bridge (W082835), July to September 1978 (Ashe, 1982); White Bridge

(V987904), 26 July 1974 (Murray, 1976a), 27 July 1976 (Murray and Ashe, 1981), 9 August 1981 (Ashe and Murray, 1983) and 20 July 2001, DAM/P. S. Cranston (DAM); d/s Whitebridge (V987900), 31 July 1978 (Ashe, 1982); d/s New Bridge (V963885), July to September 1978 (Ashe, 1982); u/s L. Leane (V964894), July to September 1978 (Ashe, 1982). **KILDARE: HA 9** - R. Liffey, Sallins (N881245), 15 July 1983 (Hayes, 1991) and Kilcullen (N841097), July 2006, JRB (DAM). **KILKENNY: HA 15** - R. Nore, Norelands Bridge (S547436), 28 August 1981 (Ashe, 1985; Hayes, 1991) and 6 September 1982 (PJA); Brownsbarn Bridge (S618391), 28 August 1981 (Hayes, 1991). **MAYO: HA 33** - R. Owenmore, Bangor Erris (F863228), 18 August 1983 (Hayes, 1991): **HA 34** - R. Moy, Ballylahan (M227992), 29 August 1982 and Cloongullaun (G348016), 30 August 1982 (Hayes, 1991). **WATERFORD: HA 18** - R. Blackwater, Ballyduff (W964992) and Lismore (X047988), 31 August 1981 (Hayes, 1991).

#### **SUBFAMILY PODONOMINAE**

##### ***Lasiodiamesa sphagnicola* (Kieffer, 1925)**

**OFFALY: HA 25** - Clara Bog, Clara (N244301), 20 March 1985, J. Reynolds (Ashe, 1987); 18 April 1985, M. de Courcy Williams (Ashe, 1987).

##### ***Parochlus kiefferi* (Garrett, 1925)**

**DONEGAL: HA 38** - footpath track to Lough Inshagh, Glenveagh (C035210), 13 May 1986 (Heneghan, 1986). **DUBLIN: HA 9** - R. Dodder headwaters (Maureen's Brook), Featherbed (O128175), 15 August 1950, CFH (Murray and Ashe, 1982) and 12 September 1982, PJA (PJA/NMI); R. Dodder, Upper (O126176), 18 July 1950, CFH (Murray, 2005). **WICKLOW: HA 10** - L. Tay, Luggala (O163008), 31 March 2009, EPA (Murray, 2012).

#### **SUBFAMILY TANYPODINAE**

##### ***Ablabesmyia (Ablabesmyia) longistyla* Fittkau, 1962**

**ANTRIM: Rathlin Island** - pool east of lighthouse (D164520), 24 July 2000 (Langton, 2002).

**CAVAN: HA 7** - L. Acurry, Baileborough (N584990), 5 July 2007, EPA (DAM): **HA 26** - R. Inny, Sheelin Bridge (N400815), 16 June 1973, JPOC (DAM): **HA 36** - Glasshouse L., Killashandra (H270060), 7 June 2007, EPA (DAM). L. Garty, Arvagh (N278978), 18 July 2007, EPA (DAM). L. Gowna (north basin), Arnagahan (N285920), 7 June 2006, EPA (DAM).

**CLARE: HA 25** - L. Graney: Caher, south shore (R568907), 24 May 2003 (PHL); Doorus (R556930), 8 June, 6 July 2006 and 11 August 2009; Drumandora (R553938), 15 June 2009, EPA (DAM). L. Derg, d/s Killaloe (M705715), 17 June 2009, EPA (DAM). L. Alewnaghta, Whitegate, west shore (R758908), 16 July 2009, EPA (DAM). L. Atorick, Woodford (R637964), 24 May 2003 (PHL): **HA 27** - L. Bridget, Derrymore, Badyke, east shore (R558797), 29 July 2009, EPA (DAM). L. Bunny, Aughrim, south east shore (R377965), 10 May 2005, 7 June and 5 September 2006, 11 June and 14 September 2009, EPA (DAM). L. Castle (Castle Lake), Kilmurry, Sixmilebridge, west shore (R484690), 17 July 2009, EPA (DAM). L. Cullaun, Corrofin, mid east shore (R317905), 22 July 2009, EPA (DAM). Gortglass L., Killadysert, south shore (R223596), 7 July 2009, EPA (DAM). L. Muckanagh, Tubber, Corrofin, south east shore (R368926), 11 June 2009 and west basin (R370922), 22 July 2009, EPA (DAM). L. Rosroe, Newmarket on Fergus, north east shore (R448697), 16 June 2009, EPA (DAM): **HA 28** - L. Doo, Milltown Malbay, north west shore (R113722), 11 June 2009 and south shore (R123721), 8 July 2009, EPA (DAM). L. Keagh, Milltown Malbay, south west shore (R100811), 8 July 2009, EPA (DAM). L. Lickeen, Kilfenora (R175909), 4 July 2006, EPA (DAM). L. Naminna, Boolteagh, north west shore (R178710), 7 July 2009, EPA (DAM).

**CORK: HA 19** - L. Allua, Ballingearry (W180652), 20 August 2008, EPA (DAM): **HA 20** - L. Abisdealy, Skibbereen (W136314), 17 June, 30 July and 17 September 2008, EPA (DAM). L. Ballin, Leap (W199389), 17 September 2008, EPA (DAM). L. Coolklure, Dunmanway (W177539), 11 August 2008, EPA (DAM). R. Bandon, Long Bridge, Dunmanway (W242631), 27 May and 22 August 1980; Bealabouy Bridge, Dunmanway (W257514), 30 June, 25 August and 25 September 1980; u/s Ballineen (W331537), 27 May, 30 June, 25 August and 25 September 1980; Ballineen Bridge (W434538), 27 May and 25 August; Castle Bernard, u/s

Bandon (W472546), 27 May, 30 June, 25 August and, 25 September 1980; 2.5km d/s Bandon (W516569), 27 May, 30 June and 25 September 1980 (all Morgan, 1982). R. Ilen, Drimoleague (W098454), Madore (W103419) and Hollybrook (W117363), 24 August 1983 (Hayes, 1991). **DERRY: HA 2** - R. Roe, Deerpark Wood, Limavaddy (C682203), 9 June 2000 (Langton, 2002): **HA 3** - R. Agivey, Ford at Ballynameen (C827148), 14 June 2008 (PHL). R. Bann, Coleraine (C854304), 17 May 2002 (PHL). Pond at Magherafelt Golf Course, Traad Point (H950873), 10 May 2000 (Langton, 2002). R. Moyola, New Bridge, Magherafelt (H955905), 4 July 2000 (Langton, 2002). **DONEGAL: HA 1** - L. Finn, Fintown, Glenties (B911018), 23 July 2009, EPA (DAM). L. Mourne, Ballybofey (H069900), 8 September 2009, EPA (DAM). L. Derg, Pettigo (H074743), 8 July 2009, EPA (DAM): **HA 36** - L. Golagh, Ballyshannon (G965655), 7 July 2009, EPA (DAM). L. Tullynasiddagh, Ballyshannon (G983656), 7 July 2009, EPA (DAM). L. Unshin, Ballyshannon (G951637), 8 June 2009, EPA (DAM). L. Vearty, Ballyshannon (G995658), 8 July 2009, EPA (DAM): **HA 37** - L. Eske, Donegal (G973844), 14 July 2009, EPA (DAM). R. Eanymore, Drumagraa Bridge (G863822), 10 August 1982, (Hayes, 1991): **HA 38** - L. Altercan, The Rosses (B755158), 19 July 2000 (Langton, 2002). L. Dunglow, The Rosses, west shore (B782119), 17 June 2009 and 5 August 2009, EPA (DAM); east shore (B787117), 19 July 2000 (Langton, 2002). L. Anure, Loughanure, east shore (B818162), 17 June and 12 August 2009, EPA (DAM). R. Gweedore, Crolly, outflow from L. Anure (B827184), 19 July 2000 (Langton, 2002). L. Keel, Crolly (B848162), 13 August 2009, EPA (DAM). L. Nasnahida, Doocharry, Dunglow (B852076), 6 August 2009, EPA (DAM). L. Dunlewey, Dunlewy (B926193), 19 July 2000 (Langton, 2002). R. Devlin, Dunlewy (B927190), 19 July 2000 (Langton, 2002). L. Veagh, GNP, boathouse near Glenveagh Castle (C022211), 21 August 1985; Derrylahan (C038233), 18 August 1985; north east shore (C039230), 16 August 1985, POD; Glenveagh Castle shore (C038230), 24 July 1985 (all Heneghan, 1986). R. Owencarrow, d/s road bridge, Glenveagh (C043235), 18 July 2000 (Langton, 2002); Newbridge, Barnesgap (C078271), 22 August 1984 (Murray, 2005). L. Nadourcan, Glenveagh (C054228), 18 July 2000 (Langton, 2002). L. Glen, Glen (C105292), 16 June and 29 July 2009,

EPA (DAM). L. Salt, Milford (C121256), 15 July 2009, EPA (DAM). L. Keel, Kilmacrennan (C158243), 16 June 2009, EPA (DAM). L. Fallaneas, Kindrum (C173424), 27 July 2009, EPA (DAM). L. Kindrum, Kindrum, Fanad (C186430), 22 July 2009, EPA (DAM). L. Shannagh, Magheradrumman, Fanad Peninsula (C216450), 16 June 2009, EPA (DAM). L. Kiltoris, Dawros, Ardara (G675976), 17 June 2009, EPA (DAM). L. Voriskey, The Rosses (B762176), 19 July 2000 (Langton, 2002): **HA 39** - L. Gartan, Church Hill (C055159), 10 June and 22 July 2009, EPA (DAM); L. Gartan, Church Hill, north shore, (C065173), 18 July 2000 (Langton, 2002). **DOWN: HA 3** - R. Leitrim, Leitrim Bridge, Hilltown (J217285), 13 August 1998 (PHL). R. Rocky, Hilltown (J233277), 26 September 1997 (PHL). **FERMANAGH: HA 36** - L. Lattone, Kiltyclogher (H003456), 29 June 2000 and L. Macnean, Upper, Belcoo (H042403), 29 June 2000 (Langton, 2002). **GALWAY: HA 25** - L. Derg, Woodford (M794964), 24 May 2003 (PHL): **HA 29** - L. Cutra, Gort (R485986), 24 May 2003 (PHL): **HA 30** - L. Anillaun, Maam Cross (L980470), 8 June, 1 August and 5 September 2007, EPA (DAM). L. Ballyquirke, Moycullen (M232317), 14 June and 8 August 2007, EPA (DAM). L. Beaghcauneen, Ballinaboy (L679470), 6 June and 12 September 2007, EPA (DAM). L. Bofin, Maam Cross (M034441), 7 June and 31 July 2007, EPA (DAM). L. Lettercraffroe, Oughterard (M056376), 14 June 2007, EPA (DAM). L. Maumwee, Maam Cross (L977485), 8 June 2007, EPA (DAM). L. Ross, Moycullen (M200363), 24 May 2003 (PHL). R. Grange, Grange Bridge (M428498), 16 August 1981 (Hayes, 1991): **HA 31** - L. Anaserd, Ballyconneely (L605443), 20 June 2006, 6 June and 17 July 2007, EPA (DAM). L. Aunwillan, Carraroe (L936255), 7 June and 25 July 2007, EPA (DAM). L. Ballynahinch, Ballynahinch (L777478), 6 June and 23 July 2007, EPA (DAM). L. Ballynakill, Gorumna (L867236), 20 June, 10 July and 8 August 2006, EPA (DAM). L. Derryclare, Recess (L825485), 16 July 2007, EPA (DAM). L. Illauntrasna, Glentrasna, Garomna (L888254), 6 June and 25 July 2007, EPA (DAM). L. Loughanaure, Kilkieran (L828320), 7 June and 24 July 2007, EPA (DAM). L. Nahasleam, Maam Cross (L972440), 20 June 2006, 7 June and 1 August 2007, EPA (DAM). L. Shindilla, Derreennacreeva, south shore (L958460), 20 June 2006, EPA (DAM). R. Owentouey, Tullywee Bridge, Recess (L873474), 18



August 1981 (Hayes, 1991): **HA 32** - L. Ballynakill, Cleggan (L639581), 11 September 2007, EPA (DAM). L. Enask, Beaghcauneen (L662468), 17 July 2007, EPA (DAM). L. Fadda, Beaghcauneen (L668455), 17 July 2007, EPA (DAM). L. Pollacappul, Kylemore (L754582), 9 July 2007, EPA (DAM). **KERRY: HA 21** - L. Cloonaghlin, Waterville (V611708), 24 July 2008, EPA (DAM). L. Currane, Waterville (V535664), 18 June and 22 July 2008, EPA (DAM). Eagles L., Knocknagantee (V674728), 9 August 2005, JRB (DAM). L. Inchiquin, Kenmare (V837629), 18 June and 1 September 2008, EPA (DAM). L. Namona, Waterville (V596711), 19 June 2008, EPA (DAM). R. Inny, Scarriff Brrdge (V504696), 24 August 1983 (Hayes, 1991): **HA 22** - L. Acoose, Slievanore, Killorglin (V755854), 9 July 2008, EPA (DAM). L. Cummernamuck, Killorglin (V745897), 20 June and 18 July 2008, EPA (DAM). Doo L., Muckross Penninsula (V949860), 5 July 1973, DJD (Douglas and Murray, 1980). L. Guitane, Crohane, Killarney (W025846), 26 June and 8 July 2008, EPA (DAM). L. Leane, Killarney, Castlough Bay (V966866), 27 June 1973 and Fossa shore (V907913), 27 July 1973 (Douglas and Murray, 1980); Killarney (V931886), 24 June 2008, EPA (DAM); Mahony's Point (V932912), 24 August 1973 and Victoria Bay (V946900), 20 June 1973 (Douglas and Murray, 1980). Muckross Lake, Dundag Bay (V964858), 12 July 1972 (Murray, 1974) and 7 July 1973 (Murray, 2005); Muckross Lake, mid lake (V950853), 16 July 2008, EPA (DAM). R. Caragh, Blackstones Bridge, d/s R. Acoose confluence (V710864), 4 August 1975, CD (Dowling *et al.*, 1981). R. Flesk, d/s Clydagh/Loo confluence (W084814), June to August 1978 (Ashe, 1982); White Bridge (V987904), 29 May 1973 (Douglas and Murray, 1980); d/s Whitebridge (V987900) and d/s New Bridge (V963885), June to August 1978 (Ashe, 1982). R. Loo, Aughnanus Bridge, Crohane (W045790), June to August 1978 (Ashe, 1982). Upper Lake, Killarney (V909821), 24 June and 9 September 2008, EPA (DAM). **KILKENNY: HA 15** - R. Nore, Norelands Bridge (S547436), 28 August 1981 (Hayes, 1991). **LEITRIM: HA 26** - L. Acres, Drumshanbo (G968099), 9 September 2008, EPA (DAM). L. Boderg, Derrycarne, north west shore (N013915), 10 September 2008, EPA (DAM): **HA 35** - L. Annary, Dromahair (G817338), 10 June 2008, EPA (DAM). **LIMERICK: HA 24** - Bleach Lake, Pallaskenry

(R441569), 13 June 2009, EPA (DAM). **LONGFORD: HA 26** - L. Forbes, Cloonard, Newtownforbes (N084821), 10 September 2008, EPA (DAM). **MAYO: : HA 26** - L. Nanoge, Urlaur (M506903), 18 June and 27 August 2008, EPA: **HA 30** - L. Aille, Westport (M071807), 24 June and 8 August 2008, EPA (DAM): **HA 32** - L. Doo, Delphi, west shore (L835681), 12 July 2006, EPA (DAM); north east shore (L834689), 22 August 2002, WM (DAM). L. Glencullin, Delphi, north west shore (L815699), 26 June 2008, EPA (DAM). R. Burleemslough, Clapper Bridge Ford, u/s Roonagh L., Cloonlaur (L754759), 5 August 2004, DAM/WM (DAM). R. Bunowen, Louisburg, u/s bridge (L807807), 5 August 2004 (DAM). L. Fin, Delphi (L841657), 28 June and 12 July 2006, EPA (DAM). R. Owengarve, Mulranny, Rosgalliv Bridge (L886962), 4 August 2004 (DAM). R. Altahoney, Newport (F950050), 8 July 1975 (DAM). L. Feeagh, Newport (L975983), 24 July 2008, EPA (DAM). R. Erriff, Ashleigh Falls (L895645), 18 August 1981 (Hayes, 1991). L. Moher, Liscarney, Westport (L977766), 24 June and 21 July 2008, EPA (DAM): **HA 33** - L. Acorrymore, Achill Island (F578057), 5 August 2004 (DAM). L. Carrowmore, Derreens, Bangor (F833299), 28 July 2008, EPA (DAM): **HA 34** - L. Conn, Brackwansha (G191098), 18 June 2008, EPA (DAM); Illannaglashy (G207070), 20 August 2008, EPA (DAM). L. Cullin, Drummon Wood (G235046), 18 June 2008, EPA (DAM). L. Lannagh, Castlebar, west shore, (M109883), 21 August 2008, EPA (DAM). L. Levally, Massbrook (G146043), 23 July 2008, EPA (DAM). L. Washpool, Ballycarra (M219842), 15 August 2008, EPA (DAM): **Clare Island** - Creggan L., Lecarrow (L689857), June to October 1998 and 1999 (Fahy, 2002). L. Poirin Fuinch (L706857), 10 August 1999 (Fahy, 2002). **MEATH: HA 7** - R. Boyne, Ardsallagh, opposite R. Skane inflow (N895628), 26 August 1984 (DAM); Slane Bridge (N965737), Oldbridge (O045761) and d/s Oldbridge (O062753), 19 July 1989 (DAM). R. Blackwater, Carnaross Bridge (N685779), 4 November 1975 (O'Flaherty, 1976). **MONAGHAN: HA 36** - Kilroosky L., Clones (H494274), 28 June 2000 (Langton, 2002). **ROSCOMMON: HA 26** - R. Suck, Ballyforan (M817464), 16 July 1981 (Hayes, 1991). L. Cavetown, Boyle (M832974), 17 July 2008, EPA (DAM). L. Key, Boyle (G838057), 6 August 2008, EPA (DAM). L. Ree, Yew Point, Barley Harbour (N018485), 13 June 2007, EPA

(DAM). **SLIGO: HA 26** - L. Gara, Cuppanagh, Cloonlough (G714013), 5 September 2008, EPA (DAM): **HA 35** - L. Easky, Ox Mountain (G446230), 17 July 2008, EPA (DAM). L. Templehouse, Ballymote (G619182), 11 June and 9 September 2008, EPA. L. Gill, Sligo (G782350), 11 June and 20 August 2008, EPA (DAM). **WATERFORD: HA 17** - Belle Lake, Dunmore East (S665049), 2 July 2009, EPA (DAM). **WESTMEATH: HA 26** - L. Owel, Mullingar (N421566), 1981 (Forde, 1985). L. Ree, Coosan (N050450), 15 August 2007 and L. Killinure, Wineport (N067458), 15 August 2007, EPA (DAM). **WEXFORD: HA 12** - R. Slaney, Edernline Bridge (S977345), 29 July 1981 (Hayes, 1991); Scarawalsh Bridge, Marshalstown (S985451), 24 July 1985 (DAM). **WICKLOW: HA 10** - L. Tay, Luggala (O163008), 28 July 2009, EPA (DAM). Roundwood Reservoir, east shore (O214002), 12 July 1983 and 14 August 1983, HD (DAM). Glendalough Lake, Laragh, WMNP (T100960), 29 July 2009, EPA (DAM). R. Avoca, Avoca Village (T203802), 7 July 1997 (Curran and Murray, 2001): **HA 12** - R. Slaney, Kilmurray (S889856), 28 July 1981 (Hayes, 1991).

***Ablabesmyia (Ablabesmyia) monilis* (Linnaeus, 1758)**

**ANTRIM: HA 4** - Dungonnell Dam, Newtown Crommelin (D193170), 20 June 2000 (Langton, 2002): **Rathlin Island** - Ally L. (D154497) and east lighthouse pool (D156516), 24 July 2000 (Langton, 2002). Outflow stream from L. Craigmacagan (D153596), 5 July 2004 (PHL): **CAVAN: HA 7** - L. Drumkeery, Baileborough (H663002), 12 June 2007, EPA (DAM). L. Drumkeery, Baileborough (H663002), 16 July 2007, EPA (DAM). L. Nadreegeal, Ballyjamesduff (N537933), 2 May and 12 June 2007, EPA (DAM). L. Acurry, Baileborough (N584990), 12 June and 5 July 2007, EPA (DAM). L. Ramor, Virginia (N612860), 24 July 2007, EPA (DAM). L. Cuilcagh, Virginia (N636895), 30 April 1968 (Murray, 1972): **HA 26** - L. Sheelin, Kilnahard (N435860), 25 July 1985 (DAM): **HA 36** - L. Garty, Arvagh (N278978), 18 July 2007, EPA (DAM). L. Macnean, Lower, Blacklion (H106378), 7 June 2007, EPA (DAM). L. Oughter, Killashandra (H349051), 6 June 2007, EPA (DAM). **CLARE: HA 25** - L. Derg, Mountshannon, west shore (R718861), 18 September 2009, EPA (DAM). L. Alewnaghta,

Whitegate, west shore (R758908), 16 July 2009, EPA (DAM). L. Alewnaghta, Whitegate, north east shore (R764914), 23 September 2009, EPA (DAM). L. Atorick, Woodford (R637964), 24 May 2003 (PHL): **HA 27** - L. Bridget, Derrymore, Badyke, east shore (R558797), 17 September 2009, EPA (DAM). L. Bunny, Aughrim, south east shore (R377965), 7 June, 4 July 2006 and 11 June, 14 July and 14 September 2009, EPA (DAM). Castle Lake, Kilmurry, Sixmilebridge, west shore (R484690), 17 July 2009, EPA (DAM). L. Cullaun, Corrofin, mid east shore (R317905), 4 July 2006, 22 July and 14 September 2009, EPA (DAM). L. Dromore, Ruan, Corrofin (R345858), 8 June 2006, EPA (DAM). Gortglass L., Killadysert, south shore (R223596), 7 July 2009, EPA (DAM); north shore (R223599), 15 September 2009, EPA (DAM). L. Inchicronan, Crusheen (R391860), 9 July 2009, EPA (DAM). L. Inchiquin, Corrofin (R270895), 4 July 2006, also 9 July and 15 July 2009, EPA (DAM). L. Muckanagh, Tubber, Corrofin, mid lake (R368926), 2 August 2006 and 22 July 2009, EPA (DAM); south east shore (R370922), 11 June and 14 September 2009, EPA (DAM). L. Rosroe, Newmarket on Fergus, south east shore (R442681), 12 August 2009, EPA (DAM); north east shore (R448697), 16 June 2009, EPA (DAM). L. Atedaun, Corrofin (R297884), 14 July 2009, EPA (DAM): **HA 28** - L. Acrow, Lisscasey (R193687), 9 May 2005, 8 June and 7 July 2006, EPA (DAM). L. Doo, Milltown Malbay, north west shore (R113722), 11 June and 15 September 2009 and south shore (R123721), 8 July 2009, EPA (DAM). L. Keagh, Milltown Malbay, south west shore (R100811), 8 July 2009 and north shore (R100813), 11 June and 15 September 2009, EPA (DAM). L. Lickeen, Kilfenora, west shore (R168909), 6 June and 4 July 2006 and mid lake (R175909), 21 July and 15 September 2009, EPA (DAM). L. Naminna, Boolteagh, north west shore (R178710), 11 June, 7 July and 15 September 2009, EPA (DAM): **HA 29** - L. Skeardeen, Kilcorkan (R388991), 7 April and 17 June 2009, EPA (DAM). **CORK: HA 18** - R. Blackwater, Duncannon (W180931), Charles Bridge, Millstreet (W248943) and Keale Bridge, Millstreet (W294936), 2 September 1981; Ballymacquirk Bridge, Banteer (W382989); Roskeen Bridge, Banteer (W444988) and Lombardstown (W463968), 1 September 1981; Killavullen (W648998), 31 August 1981 (all Hayes, 1991): **HA 19** - L. Aderry, Castlemartyr (W935730), 4

June 1969 (Bracken and Murray, 1973). L. Allua, Ballingeary (W180652), 20 August 2008, EPA (DAM). L. Gouganebarra, Inchegeelagh (W009060), 1 August 1966 (Murray, 1972): **HA 20** - L. Ballin, Leap (W199389), 17 June and 21 August 2008, EPA (DAM). Cluhir L., Unionhall (W200325), 11 November 1966 (Murray, 1972). L. Curraghally, Drinagh, Dunmanway (W234046), 17 June 2008 and 12 August 2008, EPA (DAM). L. Skeagh (Schull Reservoir), Schull (V937338), 17 June, 27 August and 17 September 2008, EPA (DAM). L. Tooreen, Crookhaven (V790259), 17 September 2008, EPA (DAM). R. Bandon, Long Bridge, Dunmanway (W242631), 27 May 1980; Bealabouy Bridge, Dunmanway (W257514), Castle Bernard (u/s Bandon) (W472546) and 2.5km d/s Bandon (W516569), 30 June 1980 (all Morgan, 1982). R. Ovane, Pierson's Bridge (W023454), 24 August 1983 (Hayes, 1991): **HA 21** - L. Bofinna, Bantry (W041488), 8 April, 18 June and 11 September 2008, EPA (DAM). L. Glenbeg, Ardgroom (V706530), 18 June and 3 September 2008, EPA (DAM). L. Mor, Adrigole (V870500), 27 August 1968 (Murray, 1972). **DERRY: HA 1** - Upper Reservoir, Creggan, Derry (C417173), 10 and 18 May 2001, 17 May 2002 (PHL): **HA 2** - Binevenagh pond, Coleraine (C691305), 18 May 2000 (Langton, 2002) and 25 August 2001 (PHL): **HA 3** - Howell's Tarn, Ballywildrick, Coleraine (C766325), 7 July 2002 (PHL). R. Agivey, Garvagh (C838154), 30 May 2002 (PHL); Glascort Bridge (C907226), 16 July 2000, PHL (Langton, 2002); Ballynameen Ford (C827148), 14 June 2008 (PHL). Glenullin Bog, Garvagh (C795132), 29 June 2008 (PHL). Pond 1, Magherafelt Golf Course, Traad Point (H950873), 10 May 2000 (Langton, 2002). L. Neagh, unspecified (H9080), no date (McLarnon and Carter, 2000). **DONEGAL: HA 1** - L. Finn, Fintown, Glenties (B911018), 9 June and 23 July 2009, EPA (DAM). L. Mourne, Ballybofey (H069900), 8 September 2009, EPA (DAM): **HA 36** - L. Golagh, Ballyshannon (G965655), 8 September 2009, EPA (DAM). L. Unshin, Ballyshannon (G951637), 8 June 2009, EPA (DAM): **HA 37** - Carn L., Blue Stack Mountains (G871886), 27 July 2005, JRB (DAM). L. Eske, Donegal (G973844), 14 July 2009, EPA (DAM). L. Shinvagh, Carricode (H005675), 24 April 2002 (PHL): **HA 38** - L. Altercan, The Rosses (B755158), 19 July 2000 (Langton, 2002). L. Dunglow, west shore (B782119), 5 August 2009, EPA (DAM);

south east shore (B783112), 12 August 1982 (BPH); east shore (B787117), 19 July 2000 (Langton, 2002). L. Anure, Loughanure (B817166), 19 July 2000 (Langton, 2002) and east shore (B818162), 17 June and 12 August 2009, EPA (DAM). L. Keel, Crolly (B848162), 17 June and 13 August 2009, EPA (DAM). L. Nabuckan, Grogan More (B850184), 27 July 2005, JRB (DAM). L. Nasnahida, Doocharry, Dunglow (B852076), 17 June and 6 August 2009, EPA (DAM). L. Nacung (Upper), Dunlewy (B904191), 19 July 2000 (Langton, 2002). L. Dunlewy, Dunlewy (B926193), 19 July 2000 (Langton, 2002). R. Devlin, Dunlewy (B927190), 19 July 2000 (Langton, 2002). L. Barra, Commeen (B935119), 10 June 2009, EPA (DAM). L. Nambraddan, Glenveagh (C022193), 30 July 1995 (Heneghan, 1986). Pond, Glenveagh (C023214), 8 July 1984 (DAM) and 22 August 1985, POD (Heneghan, 1986; Murray, 2005). L. Veagh, GNP, boathouse near Castle (C022211), 2 June, 21 July and 9 September 2009, EPA (DAM); north east shore near Visitor Centre (C033223), 19 July 2000 (Langton, 2002); north east shore (C039230), 16 August 1985, POD and 22 August 1985, LJH (Heneghan, 1986). R. Owencarrow, Glenveagh (C041229), 24 August 1985 (Heneghan, 1986). L. Nadourcan, Glenveagh (C054228), 18 July 2000 (Langton, 2002). L. an tSeisigh, Portnablagh (Sheephaven) (C043361), 16 June, 28 July and 7 September 2009, EPA (DAM). L. Glen, Glen (C105292), 16 June and 29 July 2009, EPA (DAM). L. Greenan, Loughsalt, Kilmacrennan (C117262), 16 June 2009, EPA (DAM). L. Reelan, Reelan (C131272), 15 July 2009, EPA (DAM). L. Keel, Kilmacrennan (C158243), 16 June 2009, EPA (DAM). L. Shannagh, Magheradrumman, Fanad Peninsula (C216450), 16 June, 21 July and 9 September 2009, EPA (DAM). L. Voriskey, The Rosses (B762176), 19 July 2000 (Langton, 2002): **HA 39** - L. Gartan, Church Hill (C055159), 10 June and 9 September 2009, EPA (DAM). R. Leannan, Drumaboden (C165218), 12 August 1982 (Hayes, 1991). L. Fern, Millford (C180233), 16 June 2009, EPA (DAM): **HA 40** - L. Naminn, Cloonmany (C400423), 18 August 2011 (PHL). L. Fad, Rowantree Hill, Moville (C539397), 18 August 2011 (PHL). **DUBLIN: HA 9** - water tank on roof, University College Dublin Science Centre West (O185301), 9 April 1981, PJA (DAM). R. Dodder, Fort Bridge, Bohernabreena (O009242), 21 June 1966 (Murray, 1972). **FERMANAGH: HA 36** - L.

Macnean, Lower, Belcoo (H085384), 29 June 2000 (Langton, 2002). L. Eyes, Lisbellaw (H324434), 16 August 2011 (PHL). **GALWAY: HA 25** - R. Woodford, Woodford (M732000), 24 May 2003 (PHL): **HA 29** - L. Caherglassaun, Gort (M412061), 12 April and 18 September 2007, EPA (DAM). L. Coole, Gort (M432043), 15 June 2009, EPA (DAM). L. Rea, Loughrea, east shore (M624153), 25 May 2003 (PHL); mid lake (M615154), 14 June, 7 August and 18 September 2007, EPA (DAM): **HA 30** - L. Ballyquirke, Moycullen (M232317), 8 August 2007, EPA (DAM). L. Beaghcauneen, Ballinaboy (L679470), 6 June, 18 July and 12 September 2007, EPA (DAM). L. Bofin, Maam Cross (M034441), 7 June and 31 July 2007, EPA (DAM). L. Corrib Upper, Oughterard (M138486), 11 June and 14 August 2007, EPA (DAM). L. Corrib Lower, Moycullen (M271360), 11 June, 28 August and 18 September 2007, EPA (DAM). L. Lettercraffroe, Oughterard (M056376), 14 June and 5 September 2007, EPA (DAM). L. Maumwee, Maam Cross (L977485), 8 June and 12 July 2007, EPA (DAM). L. Ross, Moycullen (M188365), 8 August 2007, EPA (DAM); L. Ross, Moycullen (M200363), 25 May 2003 (PHL). Stream at picnic site on N59 road, Moycullen (M204326), 25 May 2003 (PHL). R. Cregg, Addergssole Bridge (M324350), 16 August 1981 (Hayes, 1991): **HA 31** - L. Ahalia, north east shore, Maam Cross (L971402), 18 June and 23 September 2009, EPA (DAM). L. Anaserd, Ballyconneely (L605443), 20 June, 10 July 2006 and 11 September 2007, EPA (DAM). L. Ardderry, Maam Cross (L982458), 25 May 2003 (PHL), 7 June and 1 August 2007, EPA (DAM). L. Aunwillan, Carraroe (L936255), 7 June and 25 July 2007, EPA (DAM). L. Ballynahinch, Ballynahinch (L777478), 6 June, 23 July and 13 September 2007, EPA (DAM). L. Ballynakill, Gorumna (L867236), 15 May and 10 July 2006, EPA (DAM). L. Derryclare, Recess (L825485), 16 July 2007, EPA (DAM). L. Illauntrasna, Glentrasna, Garomna (L888254), 25 July and 12 September 2007, EPA (DAM). L. Loughanaure, Kilkieran (L828320), 7 June, 24 July and 12 September 2007, EPA (DAM). L. Nahasleam, Maam Cross (L972440), 16 May, 8 August, 12 September 2006, 7 June and 13 September 2007, EPA (DAM). L. Shindilla, Derreennacreeva, south shore (L958460), 7 June, 26 July and 13 September 2007, EPA (DAM): **HA 32** - L. Aughrusbeg, Cleggan (coastal) (L557582), 10 July

2007, EPA (DAM). L. Ballynakill, Cleggan (L639581), 5 June and 11 September 2007, EPA (DAM). L. Enask, Beaghcauneen (L662468), 6 June and 17 September 2007, EPA (DAM). L. Fadda, Beaghcauneen (L668455), 6 June, 17 July and 11 September 2007, EPA (DAM). L. Nambrackmore, Ballinaboy, Toombeola (L716454), 6 June, 27 July and 12 September 2007, EPA (DAM). L. Pollacappul, Kylemore (L754582), 2 April, 5 June and 9 July 2007, EPA (DAM). L. Kylemore, Letterfrack (L771582), 5 June, 30 July and 10 September 2007, EPA (DAM). Stream near Administration Centre, CNP, Letterfrack (L715575), 16 September 1986 (Heneghan, 1987). **KERRY: HA 18** - R. Blackwater, Lacknastooka (R153008), 2 September 1981 (Hayes, 1991): **HA 21** - L. Brin, Derreeny (V780775), 18 June, 13 July and 10 September 2008, EPA (DAM). L. Clonee, Kenmare (V800639), 28 August 1968 (Murray, 1972). L. Cloonaghlin, Waterville (V611708), 19 June and 24 July 2008, EPA (DAM). L. Currane, Waterville (V535664), 18 June, 22 July 2008 and 10 September 2008, EPA (DAM). L. Derriana, north shore (V605735), 6 August 1973, JPOC (DAM). Eagles L., Knocknagantee (V674728), 9 August 2005, JRB (DAM). Erik L., Derrygarrieff (V881777), 9 August 2005, JRB (DAM). L. Inchiquin, Kenmare (V837629), 18 June, 1 and 17 September 2008, EPA (DAM). L. Namona, Waterville (V596711), 19 June 2008, EPA (DAM): **HA 22** - L. Acoose, Slievanore, Killorglin (V755854), 19 June, 9 July and 9 September 2008, EPA (DAM). L. Caragh, Killorglin (V719904), 20 June and 15 July 2008, EPA (DAM). L. Cummernamuck, Killorglin (V745897), 20 June, 18 July and 9 September 2008, EPA (DAM). L. Guitane, Crohane, Killarney (W025846), 16 May 2005, 26 June, 8 July and 9 September 2008, EPA (DAM). L. Leane, Killarney: Brickeen, (V937850), 1973 (Douglas and Murray, 1980); Castlelough Bay (V966866), 27 June 1973, JPOC (Douglas and Murray, 1980) and Ross Bay (V945850), 1973 (Douglas and Murray, 1980). L. Leane, Killarney (V931886), 10 July and 18 September 2008, EPA (DAM). Muckross Lake: Dundag Bay (V964858), 12 July 1972 (Murray, 1974) and 23 July 1973 (Douglas and Murray, 1980); Goleen Bay (V963853) and Kilbeg Bay (V960860), 29 May 1973 (Douglas and Murray, 1980); mid lake (V950853), 16 July and 18 September 2008, EPA (DAM). R. Caragh, d/s confluence with R. Owenroe (V720815), Bealalaw Bridge



(V715832), Blackstones Bridge, d/s confluence with R. Acoose (V710864) and outflow from L. Caragh (V713924), 1975, CD (Dowling *et al.*, 1981). R. Flesk, White Bridge (V987904), 29 May 1973 (Douglas and Murray, 1980); d/s Whitebridge (V987900), d/s New Bridge (V963885) and u/s L. Leane (V964894), June to August 1978 (Ashe, 1982). Upper Lake, Killarney, Gallavalley (V891817), 1973 (Douglas and Murray, 1980); west basin (V909821), 1973 (Douglas and Murray, 1980) and 17 July and 9 September 2008, EPA (DAM): **HA 23** - L. Cam, Castlegregory (Q597079), 18 September 2008, EPA (DAM). **LEITRIM: HA 26** - L. Acres, Drumshanbo (G968099), 11 June 2008, EPA (DAM): **HA 35** - L. Annary, Dromahair (G817338), 23 July 2008, EPA (DAM). L. Lackagh, Boleybrack (G920320), 3 August 2005 JRB (DAM). L. Nabrack, Crocknagapple (G860477), 4 August 2005, JRB/MC (DAM). L. Sandy, Crocknagapple (G891448), 4 August 2005, JRB/MC (DAM). **LIMERICK: HA 24** - Bleach L., Pallaskenry (R441569), 13 June and 28 July 2009, EPA (DAM). L. Gur, Holycross (R646413), 13 June, 28 July and 16 September 2009, EPA (DAM). **LONGFORD: HA 26** - L. Forbes, Cloonard, Newtownforbes (N084821), 10 September 2008, EPA (DAM). **MAYO: HA 26** - L. Nanoge, Urlaur (M506903), 18 June and 27 August 2008, EPA (DAM): **HA 30** - L. Aille, Westport (M071807), 24 June, 8 August and 18 September 2008, EPA (DAM). L. Carra, Keel Bridge, Ballinrobe (M165680), 28 April and 19 June 2008, EPA (DAM). L. Mask, Toormakeady, west shore (M113702), 24 June 2008, EPA (DAM): **HA 32** - L. Doo, Delphi, west shore (L835681), 12 July 2006 and 25 August 2008, EPA (DAM). L. Glencullin, Delphi, south west shore (L819696), 25 August 2008 and north west shore (L815699), 26 June 2008, EPA (DAM). R. Burleemslough, Killeen, Clapper Bridge Ford, u/s Roonagh L. (L754759), 5 August 2004, DAM/WM (DAM). L. Fin, Delphi (L841657), 19 May 2005, 28 June and 12 July 2006, EPA (DAM). R. Owengarve, Mulranny, Rosgalliv Bridge (L886962), 4 August 2004, DAM/WM (DAM). R. Altahoney, Newport (F950050), 8 July 1975 (DAM). L. Feeagh, Newport (L975983), 25 June, 24 July and 17 September 2008, EPA (DAM). L. Moher, Liscarney, Westport (L977766), 24 June, 21 July and 18 September 2008, EPA (DAM). Westport L., Westport Woods Hotel (L985843), 7 May 2004, DAM/WM (DAM). L. Ballin,

north shore, Westport (L996882), 25 June 2008, EPA (DAM): **HA 33** - L. Acorrymore, Achill Island (F578057), 29 September 2004, DAM/WM (DAM), 17 June, 16 July and 17 September 2008, EPA (DAM). L. Keel, Achill Island, south west shore (F641055), 17 September 2008, EPA (DAM); south east shore (F650051), 17 June and 16 July 2008, EPA (DAM). Cross L., Drumreagh, Belmullet (F651299), 17 September 2008, EPA (DAM). Bunacurry L., Achill Island (F695048), 29 September 2004, DAM/WM (DAM). Bog pool, Achill Island (F712008), 5 August 2004, DAM/WM (DAM). R. Owenmore, Bangor Erris (F863228), 18 August 1983 (Hayes, 1991). Bog pool, Glenamoy (F896345), April, June to August and November 1973, CD (Dowling, 1975; Dowling and Murray, 1981): **HA 34** - L. Alone, Ox Mountains (G367157), 5 August 2005, JRB/MC (DAM). L. Conn, south basin, Illannaglashy (G207070), 20 August 2008, EPA (DAM). L. Cullin, Drummon Wood (G235046), 18 June 2008, EPA (DAM). L. Lannagh, Castlebar, west shore (M109883), 21 August 2008, EPA (DAM). L. More, Ballynagoraher (G115044), 12 September 2006, EPA (DAM). Washpool L., Ballycarra (M219842), 19 June 2008, EPA (DAM): **Clare Island:** - roadside, Ballytoughey Weavers (L699870), 20 August 2002, pond, east of Maum road (L710863), 28 April and 5 June 2002 and L. Leinapollbauty, Lecarrow (L691856), 5 June 2002 (Murray and Murray, 2003). Creggan L., Lecarrow (L689857), 10 June and 7 July 1999 (Fahy, 2002) and 21 August 2002 (Murray and Murray, 2003). L. Poirin Fuinch (L706857), 7 July 1999 (Fahy, 2002). **MEATH: HA 7** - R. Boyne: Ardsallagh, adjacent to St Bridget's Well (N897635), 24 August 1984 (DAM); Stackallen Bridge (N917713), 17 August 1988 (Murray, 1988); Slane Bridge (N965737), Knowth Weir (N995720) and Oldbridge (O045761), 19 July 1989 (DAM). R. Blackwater, Carnaross Bridge (N685779), 4 November 1975 (O'Flaherty, 1976); Donaghpatrick (N819723), 9 July 1975 (DAM). **MONAGHAN: HA 36** - L. Annaghmakerrig, Newbliss (H585205), 27 June 2006, EPA (DAM). L. Avagnon, Latton, Cotehill (H688133), 11 July 2007, EPA (DAM). L. Drumlona, Rockcorry (H636176), 11 July 2007, EPA (DAM). Kilroosky L., Clones (H494274), 28 June 2000 (Langton, 2002). L. Summerhill, Clones (H490279), 26 April 2007, EPA (DAM) and Magheraveely (H490280), 28 June 2000 (Langton, 2002). **OFFALY: HA 25** -

R. Shannon, Shannon Bridge (M967254), 15 August 1981 (Hayes, 1991). **ROSCOMMON: HA 26** - L. Annaghmore, Strokestown, Elphin (M902838), 15 July and 2 September 2008, EPA (DAM). L. Cavetown, Boyle (M832974), 17 July 2008, EPA (DAM). L. Funshinagh, north of Brideswell (M933513), 13 June and 11 September 2007, EPA (DAM). L. Glinn, Loughglinn, Castlerea (M629870), 12 June, 25 August and 9 September 2008, EPA (DAM). **SLIGO: HA 26** - L. Gara, Cuppanagh, Cloonlough (G714013), 5 September 2008, EPA (DAM): **HA 34** - L. Talt, Gleneask (G402151), 18 June and 24 September 2008, EPA (DAM). R. Moy, Annagh (G466123), 30 August 1982 (Hayes, 1991): **HA 35** - L. Arrow, Ballinafad (G789123), 11 June 2008, EPA (DAM). L. Easky, Ox Mountain (G446230), 18 June, 17 July and 25 September 2008, EPA (DAM). L. Kilsallagh (Reservoir), Kilsallagh (G734393), 10 June, 23 July and 8 September 2008, EPA (DAM). L. Templehouse, Ballymote (G619182), 4 September 2008, EPA (DAM). L. Gill, Sligo (G782350), 20 August 2008, EPA (DAM). R. Easky, Easky (G377378), 19 August 1983 (Hayes, 1991). **TIPPERARY: HA 16** - R. Drish, Boolabeha Bridge (S190619), 6 July 1992 (Murray and Lynch, 1992): **HA 25** - L. Derg, Dromineer (M809858), 17 June 2009, EPA (DAM). **TYRONE: HA 1** - L. Moor, Altishane, Strabane (H446984), 17 August 2011 (PHL). L. Oak, Gortin, Newtownstewart (H498843), 16 August 2011 (PHL). L. Fingrean, Craggan, Omagh (H576775), 16 July 2011 (PHL). **WATERFORD: HA 16** - L. Ballyscanlan (Ballyscanlan Reservoir), Tramore (S540030), 19 August 2009, EPA (DAM): **HA 17** - L. Carrigavantry, Tramore (S548022), 3 July 2009, EPA (DAM): **HA 18** - R. Blackwater, Ballyduff (W964992), 31 August 1981 (Hayes, 1991). **WESTMEATH: HA 25** - R. Brosna, Cullion, 25m below fish farm (N431556), May 1990 (Murray, 1990). **HA 26** - L. Owel, Mullingar (N421566), 24 July 1973, NH (Hayes, 1980): **HA 36** - L. Bane, Collinstown (N550712), 26 April, 23 May, 26 June, 22 August and 19 September 2006, EPA (EPA). **WICKLOW: HA 10** - L. Ouler, Tonelagee (O091023), 8 August 2005, JRB (DAM). L. Bray Lower, Glenree (O140163), 16 June 2009, EPA (DAM). L. Dan, Roundwood (O157035), 15 June 2009, EPA (DAM). R. Glencullen, Knocksink (O217182), 1970, KC (Clabby and Bracken, 1976). L. Tay, Luggala (O163008), 16 June, 28 July and 2 September 2009, EPA (DAM).

Upper Glendalough Lake, Laragh, WMNP (T100960), 7 July 1973 (Murray, 2005) and 29 July 2009, EPA (DAM). R. Avonmor, Laragh Bridge (T144965), 4 July 1996, MKQ (DAM). R. Avonmore, Lion Arch Bridge (T194833), 11 July 1997, FC (Curran, 2001). R. Avoca, Avoca Village (T203802), 11 July 1997 (Curran and Murray, 2001).

***Ablabesmyia (Ablabesmyia) phatta* (Egger, 1864)**

**ANTRIM: Rathlin Island** - L. Craigmacagan (D154498), July 2004 (PHL). **CAVAN: HA 7** - L. Acurry, Baileborough (N584990), 5 July 2007, EPA (DAM). L. Ramor, Virginia (N603871), May 1971, DJD/DAM (Douglas, 1971). L. Mullagh, Mullagh (N680856), 23 May 1968 (Murray, 1972): **HA 36** - L. Derrybrick, Milltown, Belturbet (H346117), 3 September 2007, EPA (DAM). L. Gowna (north basin), Arnagahan (N285920), 7 June 2006, EPA (DAM). **CLARE: HA 25** - L. Alewnaghta, Whitegate, west shore (R758908), 16 July 2009, EPA (DAM): **HA 27** - L. Bunny, Aughrim, south east shore (R377965), 7 June, 4 July 2006, 11 June and 14 July 2009, EPA (DAM). L. Cullaun, Corrofin, mid east shore (R317905), 22 July 2009, EPA (DAM). L. Dromore, Ruan, Corrofin (R352864), 16 June 2009, EPA (DAM). L. Muckanagh, Tubber, Corrofin (R368926), 7 June, 22 July 2009, EPA (DAM) and south east shore (R370922), 11 June 2009, EPA (DAM). L. Rosroe, Newmarket on Fergus, south east shore (R442681), 12 August 2009, EPA (DAM); north east shore, (R448697), 16 June and 16 September 2009, EPA (DAM): **HA 28** - L. Keagh, Milltown Malbay, south west shore (R100811), 8 July 2009, EPA (DAM); north shore, 11 June and 15 September 2009, EPA (DAM): **HA 29** - L. Skeardeen, Kilcorkan (R388991), 17 June 2009, EPA (DAM). **CORK: HA 19** - L. Aderry, Castlemartyr (W935730), 4 June 1969, NH (Bracken and Murray, 1973): **HA 20** - L. Curragalicky, Drinagh, Dunmanway (W234046), 17 June and 12 August 2008, EPA (DAM): **HA 21** - L. Bofinna, Bantry (W041488), 18 June 2008, EPA (DAM). **DERRY: HA 3** - Glenullin Bog, Garvagh (C795132), 7 June 2008 (PHL). **DONEGAL: HA 1** - L. Finn, Fintown, Glenties (B911018), 23 July 2009, EPA (DAM): **HA 36** - L. Golagh, Ballyshannon (G965655), 7 July 2009, EPA (DAM): **HA 37** - L. Eske, Donegal (G973844), 14 July 2009, EPA (DAM):

**HA 38** - L. Altercan, The Rosses (B755158), 19 July 2000 (Langton, 2002). L. Dunglow, Dunglow, The Rosses (B782119), 17 June 2009, EPA (DAM). L. Anure, Loughanure, east shore (B818162), 12 August 2009, EPA (DAM). L. Nasnahida, Doocharry, Dunglow (B852076), 17 June 2009, EPA (DAM). L. Barra, Commeen (B935119), 20 July 2009, EPA (DAM). L. Naweelogue, Glenveagh (B974185), 4 July 1984 (Twomey, 1984). Pond, Glenveagh (C023214), 19 June and 23 June 1986 (Heneghan, 1986) and 27 June 1988 (DAM). L. an tSeisigh, Portnablagh (Sheephaven) (C043361), 16 June 2009, EPA (DAM). L. Greenan, Kilmacrennan (C117262), 16 June 2009, EPA (DAM). L. Keel, Kilmacrennan (C158243), 16 July 2009, EPA (DAM). L. Shannagh, Magheradrumman, Fanad Peninsula (C216450), 21 July 2009, EPA (DAM). L. Voriskey, The Rosses (B762176), 19 July 2000 (Langton, 2002).

**DUBLIN: HA 9** - pond, University College Dublin, Belfield (O185300), 25 April 1973 (DAM). **GALWAY: HA 29** - L. Rea, Loughrea, east shore (M624153), 25 May 2003 (PHL): **HA 30** - L. Anillaun, Maam Cross (L980470), 8 June and 5 September 2007, EPA (DAM). L. Ballyquirke, Moycullen (M232317), 14 June 2007, EPA (DAM). L. Beaghcauneen, Ballinaboy (L679470), 6 June and 18 July 2007, EPA (DAM). L. Corrib, no data (M1545), 1980, BC (DAM). L. Corrib, lower basin, Moycullen (M271360), 11 April 2007, EPA (DAM). L. Maumwee, Maam Cross (L977485), 12 July 2007, EPA (DAM). Stream at picnic site on N59 road, Moycullen (M204326), 25 May 2003 (PHL): **HA 31** - L. Anaserd, Ballyconneely (L605443), 20 June, 10 July, 17 July and 11 September 2007, EPA (DAM). L. Ballynahinch, Ballynahinch (L777478), 6 June and 13 September 2007, EPA (DAM). L. Ballynakill, Gorumna (L867236), 20 June 2006, EPA (DAM): **HA 32** - L. Aughrusbeg, Cleggan (L557582), 5 June 2007, EPA (DAM). L. Fadda, Beaghcauneen (L668455), 17 July 2007, EPA (DAM). **KERRY: HA 21** - L. Cloonaghlin, Waterville (V611708), 24 July 2008, EPA (DAM). L. Currane, Waterville (V535664), 18 June and 10 September 2008, EPA (DAM). L. Derriana, north shore (V605735), 6 August 1973, JPOC (DAM): **HA 22** - L. Acoose, Slievanore, Killorglan (V755854), 19 June, 9 July and 9 September 2008, EPA (DAM). L. Leane, Killarney, Castlough Bay (V975873), 27 June 1973 (Douglas and Murray, 1980). Muckcross Lake,

Killarney, Dundag Bay (V964858), 12 July 1972 (Murray, 1974) and May 1973 (Douglas and Murray, 1980): **HA 23** - L. Cam, Castlegregory (Q597079), 18 September 2008, EPA (DAM). L. Gill, Castlegregory (Q603139), 25 June and 28 August 2008, EPA (DAM). **LIMERICK: HA 24** - L. Gur, Holycross (R646413), 13 June and 28 July 2009, EPA (DAM). **MAYO: HA 26** - L. Nanoge, Urlaur (M506903), 18 June 2008, EPA (DAM): **HA 30** - L. Carra, Keel Bridge, Ballinrobe (M165680), 19 June 2008, EPA (DAM): **HA 32** - L. Doo, Delphi, north east shore (L834689), 22 August 2002, DAM/WM (DAM). R. Altahoney, Newport (F950050), 1969, EF (DAM). R. Owenwee, Belclare, Westport (L960820), July 1911, PHG (Grimshaw, 1912). Knappagh, Westport (L980805), July 1911, PHG (Grimshaw, 1912). L. Ballin, Westport, north shore (L996882), 25 June 2008, EPA (DAM): **HA 33** - L. Keel, Achill Island, south east shore (F650051), 17 June 2008, EPA (DAM); mid lake, (F651059), 16 July 2008, EPA (DAM). Bog pool, Achill Island (F712008), 5 August 2004, DAM/WM (DAM). Bog pools, Glenamoy (F896345), March, April, June to August and November 1973, CD (Dowling, 1975; Dowling and Murray, 1981): **HA 34** - L. Conn, south basin, Illannaglashy (G207070), 20 August 2008, EPA (DAM). L. Cullin, Drummon Wood (G235046), 18 June and 20 August 2008, EPA (DAM). L. Lannagh, Castlebar, west shore (M109883), 21 August 2008, EPA (DAM). L. Levally, Massbrook (G146043), 23 July 2008, EPA (DAM). L. More, Ballynagoraher (G115044), 12 September 2006, EPA (DAM). L. Washpool, Ballycarra (M219842), 15 August 2008, EPA (DAM): **Clare Island: L. Poirin Fuinch (L706857)**, June and August 1999 (Fahy, 2002). **MEATH: HA 7** - R. Boyne, Bellinter Bridge (N894625), 18 August 1968 (Murray, 1972). **ROSCOMMON: HA 26** - L. Annaghmore, Strokestown/Elphin (M902838), 15 July 2008, EPA (DAM). L. Glinn, Loughglinn, Castlerea (M629870), 25 August and 9 September 2008 (DAM). **SLIGO: HA 26** - L. Gara, Monastredan (M708996), 5 September 2008, EPA (DAM): **HA 34** - L. Talt, Gleneask (G402151), 18 June 2008, EPA (DAM): **HA 35** - L. Arrow, Ballinafad (G789123), 11 June 2008, EPA (DAM). L. Gill, Sligo (G782350), 11 June 2008, EPA (DAM). **WATERFORD: HA 17** - L. Carrigavantry, Tramore (S548022), 3 July 2009, EPA (DAM). **WESTMEATH: HA 25** - L. Ennell, Tudenham (N415466), 31 July 1966

(Murray, 1972). **WICKLOW: HA 9** - bog pool, Sally Gap, Featherbed Mountain (O130113), 8 July 1984, CCO (Gavin, 1989): **HA 10** - outflow from Upper Glendalough Lake, Laragh, WMNP (T109964), 16 July 1996, EMcE/DAM (McEntee, 1997).

*Ablabesmyia* sp. (dark pe)

**MAYO: HA 34** - L. Conn, south basin, Illannaglashy (G207070), 20 August 2008, EPA (DAM). **KERRY: HA 21** - Eagles L., Knocknagantee (V674728), 9 August 2005, JRB (DAM). **LONGFORD: HA 26** - L. Forbes, Cloonard, Newtownforbes (N084821), 27 August 2008, EPA (DAM).

*Anatopynia plumipes* (Fries, 1823)

**ANTRIM: HA 5** - L. Mourne, Carrickfergus (J415924), 7 April 2012 (PHL). **CAVAN: HA 26** - L. Sheelin, Gore Point (N439817), ex trout stomach, March 1983, PG (DAM): **HA 36** - L. Derrybrick, Milltown, Belturbet (H346117), 4 April 2007, EPA (DAM). **CLARE: HA 27** - L. Atedaun, Corrofin (R297884), 21 April 2009, EPA (DAM): **HA 29** - L. Skeardeen, Kilcorkan (R388991), 7 April 2009, EPA (DAM). **DERRY: HA 3** - Downhill Lake, Downhill Forest, Coleraine (C757354), 17 March 1999 (Langton, 2004b). **DONEGAL: HA 37** - L. Shinvagh, Carricode (H005675), 28 March 2004 (PHL). L. Narath, Ballintra (G944670), 27 March 2004, (PHL). **KILDARE: HA 9** - pond, Lyons Estate, Celbridge (N972285), 14 March 1977, DAM (Murray and Ashe, 1983; Murray, 2005).

*Apsectrotanypus trifascipennis* (Zetterstedt, 1838)

**CLARE: HA 25** - L. Alewnaghta, Whitegate, north east shore (R764914), 23 September 2009, EPA (DAM). **DUBLIN: HA 9** - pond at Woodview, University College Dublin (O186203), 21 April 1981, GF/PJA (Murray, 2005), 1 April 1984 (Omoku, 1986) and 20 April 2005 (DAM). **GALWAY: HA 25** - L. Derg, Woodford (M794964), 24 May 2003 (PHL): **HA 29** - L. Cutra, Gort (R485986), 24 May 2003 (PHL). Ballyturin L., Ballardiggan, Gort (M496005), 24 May

2003 (PHL). **LEITRIM: HA 26** - L. Boderg, Derrycarne, north west shore (N013915), 14 May 2008, EPA (DAM): **HA 35** - L. Glenade, Manorhamilton, south east shore (G831457), 10 June, 22 July and 4 September 2008, EPA (DAM). L. Glencar, Glencar (G757435), 2 September 2008, EPA (DAM). **LONGFORD: HA 26** - L. Forbes, Cloonard, Newtownforbes (N084821), 25 June, 27 August and 10 September 2008, EPA (DAM). **MAYO: HA 30** - L. Mask, Toormakeady, west shore (M113702), 24 June 2008, EPA (DAM): **HA 32** - L. Fin, Delphi (L841657), 12 July 2006, EPA (DAM). L. Feeagh, Newport (L975983), 24 July 2008, EPA (DAM). **MONAGHAN: HA 6** - L. Naglack, Carrickmacross (H853026), 3 May 2007, EPA (DAM). **ROSCOMMON: HA 26** - L. Meelagh, Keadew (G901117), 12 July 2008, EPA (DAM). L. Key, pier at Park (G848040), 11 June 2008; west shore (G838057), 6 August 2008; pier at Hogs Island (G825054), 9 September 2008, all EPA (all DAM). **TIPPERARY: HA 16** - R. Breaghagh, Archerstown (S140568), 22 May 1992 (Murray and Lynch, 1992). **WESTMEATH: HA 25** - stream supply to fish farm, Cullion (N430557), Royal Canal, Cullion (N424563), and Royal Canal, east of fish farm, Cullion (N431554), May 1990 (all Murray, 1990): **HA 26** - L. Killinure, Ballaghkeernan Bay (N069445), 24 April 2007, EPA (DAM). L. Ree, Coosan (N050450), 15 August 2007, EPA (DAM): **HA 36** - L. Bane, Collinstown (N550712), 24 July 2006, EPA (DAM).

*Arctopelopia barbitarsis* (Zetterstedt, 1850)

**ANTRIM: HA 3** - L. Neagh, Antrim Bay (J135866), 4 May 1999 and 22 August 2001 (PHL). **ARMAGH: HA 3** - L. Neagh, Oxford Island, Lurgan (J044621), 18 July 2003 (PHL). **CAVAN: HA 7** - Park R., Virginia (N591882), 18 December 1967 (Murray, 1972). L. Cuilcagh, Virginia (N636895), 30 April 1968 (Murray, 1972). L. Mullagh, Mullagh (N680856), 23 May 1968 (Murray, 1972). **CLARE: HA 25** - L. Derg, d/s Killaloe (M705715), 18 September 2009, EPA (DAM): **HA 27** - L. Cullaun, Corrofin, mid east shore (R317905), 8 April 2009, EPA (DAM): **HA 28** - L. Keagh, Milltown Malbay, north shore (R100813), 11 June 2009, EPA (DAM). L. Naminna, Boolteagh (R180710), 15 September 2009, EPA (DAM).



**CORK: HA 19** - L. Gouganebarra, Inchegeelagh (W009060), 8 May 1966 (Murray, 1972): **HA 20** - L. Curraghally, Drinagh, Dunmanway (W234046), 9 April 2008, EPA (DAM): **HA 21** - L. Bofinna, Bantry (W041488), 8 April 2008, EPA (DAM). **DERRY: HA 3** - R. Bann, Coleraine: 13 May to 7 September 1999, 3 May to 3 July 2000, 26 April 2001, 30 June 2001, 4 May 2008 (all PHL). L. Neagh (H9080), no date (McLarnon and Carter, 2000); L. Neagh, Ballyronan (H948862), 10 May and 4 July 2000 (Langton, 2002) and 7 May 2001 (PHL). **DONEGAL: HA 36** - L. Avehy, Belalt (H043664), 27 April 2002 (PHL): **HA 38** - L. Nasnahida, Doocharry, Dunglow (B852076), 7 April 2009, EPA (DAM). L. Naweelogue, Glenveagh (B974185), 5 June 1985, LJH (DAM). L. Greenan, Kilmacrennan (C117262), 16 June 2009, EPA (DAM). L. Reelan, Reelan (C131272), 6 June and 15 July 2009, EPA (DAM): **HA 40** - L. Naminn, Cloonmany (C400423), 18 August 2011 (PHL). **GALWAY: HA 30** - L. Ballyquirke, Moycullen (M232317), 14 June 2007, EPA (DAM). L. Corrib, no location data (M1545), September 1964 (Murray, 1972) and 1980, BC (DAM). L. Maumwee, Maam Cross (L977485), 17 September 2007, EPA (DAM): **HA 31** - L. Loughanaure, Kilkieran (L828320), 16 April 2007, EPA (DAM). L. Nahasleam, Maam Cross (L972440), 6 April 2006, EPA (DAM): **HA 32** - L. Enask, Beaghcauneen (L662468), 4 April 2007, EPA (DAM). L. Nambrackmore, Ballinaboy-Toombeola (L716454), 5 April 2007, EPA (DAM). L. Pollacappul, Kylemore (L754582), 9 July 2007, EPA (DAM). **KERRY: HA 21** - L. Currane, Waterville (V535664), 10 September 2008, EPA (DAM). **MAYO: HA 32** - L. Glencullin, south west shore, Delphi (L819696), 25 August 2008, EPA (DAM). L. Moher, Lisarneey, Westport (L977766), 21 April, 21 July and 18 September 2008, EPA (DAM): **HA 34** - L. Alone, Slieve Gamph, Ox Mountains (G367157), 22 April 2005, JRB (Murray, 2005): **Clare Island** - Creggan L., Lecarrow (L689857), June to November 1998 and 1999 (Fahy, 2002). L. Poirin Fuinch (L706857), July to October 1998 and June to November 1999 (Fahy, 2002). **ROSCOMMON: HA 26** - L. Funshinagh, Brideswell (M933513), 23 April and 11 September 2007, EPA (DAM). **TIPPERARY: HA 18** - Black L., Arra Mountains (R738771), 4 May 2005, JRB (DAM). L. Curra, Galtymore Mountain (R867242), 10 August 2005, JRB (DAM).

**WESTMEATH: HA 26** - L. Coosan, Athlone (N055449), 11 September 2007, EPA (DAM).

**WICKLOW: HA 10** - L. Bray Lower, Glenree (O140164), 4 June 1986 (DAM).

***Arctopelopia griseipennis* (van der Wulp, 1859)**

**ANTRIM: HA 3** - L. Neagh, Antrim Bay (J135866), 4 May 1999 (PHL). Killylane Reservoir, Magherabane, Larne (J292985), 8 May 1999 (PHL): **Rathlin Island** - pool east of lighthouse (D164520), 24 July 2000 (Langton, 2002). Ally L. (D154497), 5 July 2004 (PHL). L. Craigmacagan (D154498), 24 July 2000 (Langton, 2002). *Menyanthes* pool (D123515), 6 July 2004 (PHL). **CLARE: HA 27** - L. Bunny, south east shore, Aughrim (R377965), 2 May 2006 and 14 September 2009, EPA (DAM). L. Cullaun, Corrofin, mid east shore (R317905), 14 September 2009, EPA (DAM). L. Dromore, Ruan, Corrofin (R345858), 8 June 2006, EPA (DAM). L. Gortglass (Gortglass L.), north shore, Killadysert (R223599), 15 September 2009, EPA (DAM). L. Rosroe, Newmarket on Fergus, north east shore (R449697), 16 September 2009, EPA (DAM): **HA 28** - L. Naminna, north west shore, Boolteagh (R178710), 1 April 2009, EPA (DAM). **CORK: HA 19** - L. Allua, Ballingeary (W180652), 4 April 2008, EPA (DAM). L. Gouganebarra, Inchegeelagh (W009060), 22 April 1966 and 27 July 1968 (Murray, 1972): **HA 20** - L. Coolkllure, Dunmanway (W177539), 16 September 2008, EPA (DAM). L. Skeagh (Schull Reservoir), Schull (V937338), 17 September 2008, EPA (DAM). L. Tooreen, Crookhaven (V790259), 10 April and 17 September 2008, EPA (DAM). R. Bandon, Bealabouy Bridge, Dunmanway (W257514), 25 August 1980 (Morgan, 1982). **DERRY: HA 3** - R. Bann, Coleraine (C854304), 12 April 1999 to 5 May 1999, 16 July 2000, 25 April 2010, 2 May 2010, 27 July 2012 (all PHL). L. Neagh, Ballyronan (H948862), 27 April and 4 May 1999 (PHL). **DONEGAL: HA 1** - L. Finn, Fintown, Glenties (B911018), 23 July 2009, EPA (DAM): **HA 38** - L. an tSeisigh, Portnablugh (Sheephaven) (C043361), 7 September 2009, EPA (DAM). **GALWAY: HA 29** - L. Rea, east shore, Loughrea (M624153), 25 May 2003 (PHL): **HA 30** - L. Corrib Lower, Hurney (M258310), 18 April 1980, BC (DAM) and Moycullen (M271360), 11 April 2007, EPA (DAM): **HA 31** - L. Ahalia, north east shore (L971402), 22 April and 23

September 2009, EPA (DAM). L. Anaserd, Ballyconneely (L605443), 20 April, 2006, 4 April and 11 September 2007, EPA (DAM). L. Ardderry, Maam Cross (L982458), 17 September 2007, EPA (DAM). L. Loughanaure, Kilkieran (L828320), 12 September 2007, EPA (DAM). L. Nahasleam, Maam Cross (L972440), 12 September 2006, EPA (DAM): **HA 32** - L. Aughrusbeg, Cleggan (coastal) (L557582), 11 September 2007, EPA (DAM). L. Ballynakill, Cleggan (L639581), 3 April 2007, EPA (DAM). L. Fadda, Beaghcauneen (L668455), 4 April and 11 September 2007, EPA (DAM). **KERRY: HA 21** - L. Currane, Waterville (V535664), 18 June 2008, EPA (DAM). L. Eagle (Eagles L.), Knocknagantee (V674728), 9 August 2005, JRB (DAM): **HA 22** - L. Kilbrean, Killarney (W003933), 7 July 1973 (Douglas and Murray, 1980). L. Leane, Killarney, Castlough Bay (V966866), 27 June 1973; Fossa (V907913), 27 July 1973; Mahony's Point (V932912), 1973; Victoria Bay (V946900), 1973 (all Douglas and Murray, 1980); O'Sullivan's Cascade (V916886), 17 April 1973 (DAM); Muckcross Boathouse (V965866), 29 August 1987, NOM (LJH); Killarney (V931886), 22 April 2008, EPA (DAM). L. Muckcross (Muckcross Lake), Dundag Bay (V964858), 12 July 1972, DAM (Murray, 1974); July 1973 (Douglas and Murray, 1980); Kilbeg Bay (V960860), 1973 (Douglas and Murray, 1980). R. Flesk, White Bridge (V987904), 29 May 1973 (Douglas and Murray, 1980); u/s New Bridge (Bridgeview), Killarney (V973895), 1972, DJD and DAM (Ashe, 1982): **HA 23** - L. Gill, Castlegregory (Q603139), 29 April 2008, 25 June and 28 August 2008, EPA (DAM). **MAYO: HA 26** - L. Nanoge, Urlaur (M506903), 24 April 2008, EPA (DAM): **HA 30** - L. Aille, Westport (M071807), 18 September 2008, EPA (DAM). L. Carra, Keel Bridge, Ballinrobe (M165680), 26 April 1996 (Murray, 2005) and 28 April 2008, EPA (DAM): **HA 32** - L. Nahaltora, Cregganbaun (L794745), 30 September 2004, DAM/WM (DAM): **HA 33** - L. Acorrymore, Achill Island (F578057), 29 September 2004, DAM/WM (DAM): **HA 34** - L. Conn, south basin, Illannaglashy (G207070), 20 August 2008, EPA (DAM). L. Washpool, Ballycarra (M219842), 25 September 2008, EPA (DAM): **Clare Island** - bog pool, Maum (L709863), 28 April 2000. L. Leinapollbauty, Lecarrow (L691856), 5 June 2002. L. Creggan, Lecarrow (L689857), 21 August 2002 (all Murray and Murray, 2003): **MEATH: HA 7** -

tailings pond, Randalstown, Navan (N845714), 19 July and 12 September 1994 (DAM), 29 March 1996 (Finnegan, 1998), 26 April 1996 and 18 May 1996 (DAM). **OFFALY: HA 25** - bog lake, Turraun (N172185), 19 January 1998 and 11 February 1998 (emerged in laboratory from larvae collected in November 1997), WT (DAM). **ROSCOMMON: HA 26** - L. Annaghmore, Strokestown, Elphin (M902838), 2 September 2008, EPA (DAM). L. Key, Boyle (G838057), 6 August 2008, EPA (DAM). **WESTMEATH: HA 25** - L. Ennell, Tudenham (N415466), 27 July 1979, (DAM): **HA 26** - L. Killinure, Wineport (N067458), 15 August 2007, EPA (DAM). **WICKLOW: HA 10** - outflow from Upper Glendalough Lake, Laragh, WMNP (T109964), 16 July 1996, EMcE and DAM (McEntee, 1997).

*Arctopelopia melanosoma* (Goetghebuer, 1933)

**KERRY: HA 22** - L. Leane, Killarney, O'Sullivan's Cascade (V916886), 17 April 1973, DJD/DAM (Murray, 2010).

*Clinotanypus (Clinotanypus) nervosus* (Meigen, 1818)

**ANTRIM: Rathlin Island** - Ally L. (D154497), 5 July 2004 (PHL). L. Craigmacagan (D154498), 24 July 2000 (Langton, 2002). *Menyanthes* pool (D123515), 6 July 2004 (PHL). **CAVAN: HA 36** - L. Ardan, Milltown, Belturbet (H354124), 6 June 2007, EPA (DAM). L. Oughter, Killashandra (H349051), 6 June 2007, EPA (DAM). **CLARE: HA 27** - L. Bridget, north basin, Derrymore, Badyke (R563803), 12 June 2009, EPA (DAM). Castle Lake, Kilmurry, Sixmilebridge, south west shore (R481688), 12 June 2009, west shore, 17 July 2009, EPA (DAM). L. Cullaun, Corrofin, east shore (R317905), 16 June 2009 EPA (DAM). L. Dromore, mid basin, Ruan, Corrofin (R352864), 16 June 2009, EPA (DAM). L. Inchicronan, Crusheen, east basin (R398866), 15 June 2009 and west basin (R391860), 9 July 2009, EPA (DAM). L. Rosroe, Newmarket on Fergus (R448697), 16 June 2009, EPA (DAM): **HA 29** - L. Skeardeen, Kilcorkan (R388991), 17 June 2009, EPA (DAM). **CORK: HA 20** - L. Tooreen, Crookhaven (V790259), 17 June 2008, EPA (DAM). **DERRY: HA 3** - L. Neagh, location unspecified

(H9080), no date (McLarnon and Carter, 2000). **FERMANAGH: HA 36** - L. Erne, Upper, Crom Castle shore, Newtownbutler (H357244), 27 June 2000 (Langton, 2002). L. Inver (Inver L.), Rosslea (H518314), 28 June 2000 (Langton, 2002). Stream, Lisnaskea (H384306), 27 June 2000 (Langton, 2002). **GALWAY: HA 30** - L. Ballyquirke, Moycullen (M232317), 14 June 2007, EPA (DAM): **HA 31** - L. Aunwillan, Carraroe (L936255), 7 June 2007, EPA (DAM). L. Ballynahinch, Ballynahinch (L777478), 6 June 2007, EPA (DAM): **HA 32** - L. Tully, Tully Cross (L695618), 19 July 2007, EPA (DAM). **KERRY: HA 22** - Muckcross Lake, Dundag Bay (V964858), 5 July 1973 (Douglas and Murray, 1980). **LIMERICK: HA 24** - L. Bleach (Bleach Lake), Pallaskenry (R441569), 13 June 2009, EPA (DAM). **MAYO: HA 30** - L. Aille, Aille, Westport (M071807), 24 June 2008, EPA (DAM). R. Owenwee, Belclare, Westport (L968826), 1910, JNH (Grimshaw, 1912). L. Moher, Liscarney, Westport (L977766), 24 June 2008, EPA (DAM): **HA 34** - L. Lannagh, Castlebar L., Castlebar (M105880), 30 June 2008, EPA (DAM). **MEATH: HA 7** - R. Blackwater, Carnaross Bridge (N685779), 4 November and 12 December 1975 and Donaghpatrick Bridge (N819723), 4 November 1975, as larvae (O'Flaherty, 1976). **MONAGHAN: HA 6** - L. Naglack, Carrickmacross (H853026), 12 July 2007, EPA (DAM): **HA 36** - L. Drumlona, Rockcorry (H636176), 11 July 2007, EPA (DAM). **OFFALY: HA 25** - bog lake, Turraun (N172185), June 1998 (DAM). **ROSCOMMON: HA 26** - L. Cavetown, Boyle (M832974), 11 June 2008, EPA (DAM). L. Glinn, Loughglinn, Castlerea (M629870), 12 June 2008, EPA (DAM). L. Grange (Grange L.), Greywood, Strokestown (M938857), 25 June 2008, EPA (DAM). **WATERFORD: HA 17** - Belle Lake, Dunmore East (S665049), 7 July 1974, DJD (DAM). **WESTMEATH: HA 26** - L. Killinure, Ballaghkeernan Bay (N069445), 26 June 2007, EPA (DAM).

***Conchapelopia (Conchapelopia) hittmairorum* Michiels and Spies, 2002**

[Pupal exuviae records for this species prior to 2002 had been determined as *Conchapelopia* sp., *Conchapelopia* Pe1 (sensu Langton, 1991) or misdetermined as *C. pallidula*. See Murray (2006b) for details.]

**CARLOW: HA 12** - R. Slaney, Motabower Bridge (S832778), 28 July 1981 (Hayes, 1991). **CLARE: HA 25** - L. Derg, d/s Killaloe (M705715), 17 June 2009, EPA (DAM). **DONEGAL: HA 40** - R. Keenagh, Hugh Roe's Bridge, Umgall (C454543), 16 August 1982 (Hayes, 1991). **GALWAY: HA 30** - L. Corrib Upper, Oughterard (M138486), 11 June 2007, EPA (DAM). **KERRY: HA 22** - R. Flesk, d/s Whitebridge (V987900), July 1976 (Ashe, 1982) and 23 July 1979, PJA (Murray, 2006b); u/s New Bridge (Bridgeview), Killarney (V973895), 27 July 1973 (Murray, 2005). **MAYO: HA 30** - L. Corrib Upper, Kitteen's Bay, Oughterard (M110463), 25 June 2010, JRB (DAM). **MEATH: HA 7** - R. Boyne, Kilcarn Bridge, Navan (N884657), 18 August 1995 (DAM). **ROSCOMMON: HA 26** - R. Suck, Castlecoote (M809627) and Ballyforan (M817464), 16 July 1981 (Hayes, 1991). **WATERFORD: HA 18** - R. Blackwater, Ballyduff (W964992), 31 August 1981 (Hayes, 1991). **WEXFORD: HA 12** - R. Slaney, Edernline Bridge (S977345), 29 July 1981 (Hayes, 1991; Murray, 2005). **WICKLOW: HA 10** - R. Glencullen (Glencullen R.), Knocksink (O218180), 18 May 1987, DEM/DAM (Morgan, 1989).

***Conchapelopia (Conchapelopia) melanops* (Meigen, 1818)**

**ANTRIM: HA 3** - R. Clogh (Clogh R.), Clough Mills (D105109), 2 July 2000 (Langton, 2002). Glenravel Water, Gartnageeragh, Newtown Crommelin (D147154), 2 July 2000 (Langton, 2002). Templewell Pond, Templepatrick (J232856), 26 July 2008 (PHL): **HA 4** - R. Bush, Conogher Bridge (C963305), 10 September 2000 and Ballyhoe Bridge (D077294), 2 July 2000 (Langton, 2002): **HA 5** - L. Mourne, Carrickfergus (J415924), 8 May 1999 (PHL). **ARMAGH: HA 3** - L. Neagh, Oxford Island, Lurgan (J044621), 18 July 2003 (PHL). **CAVAN: HA 7** - L. Drumkeery, Baileborough (H663002), 12 June 2007, EPA (DAM). L. Acurry, Baileborough (N584990), 5 July 2007, EPA (DAM). **CLARE: HA 25** - L. Graney, Drumandora, west shore (R553938), 15 June 2009, EPA (DAM): **HA 27** - L. Rosroe, Newmarket on Fergus, south east shore (R442681), 12 August 2009, EPA (DAM). L. Cullaunyheeda, Kilkishen (R488746), 13 August and 17 September 2009, EPA (DAM). **CORK: HA 20** - L. Curraghally, Drinagh,

Dunmanway (W234046), 17 June 2008, EPA (DAM). R. Bandon, Long Bridge, Dunmanway (W242631), 25 August 1980; Bealabouty Bridge, Dunmanway (W257514), 25 August 1980; u/s Ballineen (W331537), 25 August 1980 and 25 September 1980; 2.5km d/s Bandon (W516569), 25 August 1980 and 25 September 1980 (all Morgan, 1982). **DERRY: HA 1** - Upper Reservoir, Creggan, Derry (C417173), 10 May 2001 (PHL); inflow to Upper Reservoir, Creggan, Derry (C413171), 10 May 2001, 18 May 2001 and 18 May 2002 (PHL): **HA 2** - R. Bessbrook, Limavady (C655212), 9 June 2000 (Langton, 2002). R. Roe, Largy Bridge, Limavaddy (C681202), 14 July 2000 (Langton, 2002): **HA 3** - Downhill Forest Stream, Coleraine (C759348), 21 August 2001 (PHL). R. Bann, Coleraine (C854304), 30 May, 10 June, 18 June, 24 July, 7 September 1999, 25 May, 31 May, 13 June, 16 July 2000, 16 June 2001, 27 July, 3 August, 10 August, 17 August, 24 August 2012 (PHL). L. Neagh, Ballyronan (H948862), 22 August 2001, 31 May 2011 (PHL). R. Moyola, New Bridge, Magherafelt (H955905), 7 May 2001 (PHL). **DONEGAL: HA 1** - L. Mourne, Ballybofey (H069900), 9 June 2009, EPA (DAM): **HA 38** - R. Gweedore (outflow from L. Anure), Crolly (B827184), 19 July 2000 (Langton, 2002). L. Veagh, GNP, Glenveagh, north east shore (C039230), 22 August 1985, LJH (Heneghan, 1986; Murray, 2005). Owennacally stream, Glenveagh (C043226), 19 July 2000 (Langton, 2002). L. Nadourcan, Glenveagh (C054228), 18 July 2000 (Langton, 2002). L. Greenan, Loughsalt, Kilmacrennan (C117262), 16 June 2009, EPA (DAM). L. Reelan (C131272), 6 June 2009, EPA (DAM). L. Fallaneas, Kindrum (C173424), 30 April 2009, EPA (DAM). L. Shannagh, Magheradrumman, Fanad Peninsula (C216450), 9 September 2009, EPA (DAM). **DUBLIN: HA 9** - R. Dodder, Fort Bridge, Bohernabreena (O009242), 31 May 1967 (Murray, 1972); Landsdown Road Bridge (O180327), 18 June and 7 July 1967 (Murray, 1972). Upper Bohernabreena Reservoir (O095219), 3 May 1946, 30 April 1947 and 8 July 1948, CFH (DAM). **FERMANAGH: HA 35** - L. Melvin, Garrison (G938518), 29 June 2000 (Langton, 2002): **HA 36** - L. Macnean, Lower, Belcoo (H085384), 29 June 2000 (Langton, 2002). **GALWAY: HA 25** - L. Derg, Woodford (M794964), 25 April 2003 (PHL): **HA 26** - R. Tirur, Newbridge (M492699), 16 August 1981 (Hayes, 1991): **HA 30** - L. Beaghcauneen,

Ballinaboy (L679470), 6 June 2007, EPA (DAM). L. Bofin, Maam Cross (M034441), 31 July 2007, EPA (DAM). L. Maumwee, Maam Cross (L977485), 12 July 2007, EPA (DAM). L. Ross, Moycullen (M200363), 25 May 2003 (PHL): **HA 32** - L. Nambrackmore, Ballinaboy-Toombeola (L716454), 6 June 2007, EPA (DAM). **KERRY: HA 21** - L. Derriana, Waterville (V621740), 18 June 1967, JPOC (DAM). L. Brin, Derreeny (V780775), 13 July 2008, EPA (DAM). L. Eagle (Eagles L.), Knocknagantee (V674728), 9 August 2005, JRB (DAM). L. Eirk (Erik L.), Derrygarriff (V881777), 9 August 2005, JRB (DAM): **HA 22** - L. Acoose, Slievanore, Killorglin (V755854), 9 July 2008, EPA (DAM). L. Caragh, Killorglin (V719904), 15 July 2008, EPA (DAM). L. Cummernamuck, Killorglin (V745897), 18 July 2008, EPA (DAM). L. Leane, Killarney, Peninsula Bay (V940860), 1973 and Victoria Bay (V946900), 1973 (Douglas and Murray, 1980). L. Muckcross (Muckcross Lake), Dundag Bay (V964858), 12 July 1972 (Murray, 1974) and 13 August 1973, DAM (Douglas and Murray, 1980; Murray, 2005). R. Flesk, Killarney, d/s Whitebridge (V987900), July and August 1978 (Ashe, 1982); u/s Newbridge (V978900), 25 July 1974 (Douglas and Murray, 1980). R. Loo, Aughnanus Bridge, Crohane (W045790), July and August 1978 (Ashe, 1982): **HA 23** - L. Cam, Castlegregory (Q597079), 29 August and 18 September 2008, EPA (DAM). **KILDARE: HA 9** - Royal Canal, adjacent Gleneaston Wood, Leixlip (N987365), 3 May 2006 (DAM). **KILKENNY: HA 15** - R. Nore, Norelands Bridge (S547436) and Brownsbarn Bridge (S618391), 28 August 1981 (Hayes, 1991). **LAOIS: HA 15** - R. Nore, Kilbricken (S362898), 27 August 1981 (Hayes, 1991). **LEITRIM: HA 26** - L. Boderg, Derrycarne, north west shore (N013915), 10 September 2008, EPA (DAM). **MAYO: HA 32** - L. Doo, Delphi, west shore (L835681), 12 July 2006, 25 August 2008, EPA (DAM). L. Glencullin, Delphi, south west shore (L819696), 25 August 2008, EPA (DAM). R. Burleemslough, Clapper Bridge Ford, Killeen (L754759), 5 August 2004, DAM/WM (DAM). L. Moher, Liscarney, Westport (L977766), 21 July 2008, EPA (DAM). L. Knappabeg, Westport (M010803), 23 July 2008, EPA (DAM): **HA 33** - bog pools, Glenamoy (F896345), August 1973, CD (Dowling, 1975; Dowling and Murray, 1981). **MEATH: HA 6** - R. Dee, Drumconrath (N910894), 27 July 1983 (Hayes, 1991): **HA 7** - R.



Boyne, Bellinter Bridge (N894625), 11 August and 31 August 1999, DAM/WM (DAM); Ardsallagh, adjacent St Bridget's Well (N897635), 16 June 1974 and 6 September 1981 (DAM), 7 July 1988, (Murray, 1988); Stackallen Bridge (N917713), Slane Bridge (N965737), Oldbridge (O045761) and d/s Oldbridge (O062753), all 19 July 1989 (all DAM): **HA 8** - Meadesbrook, Kilmoon, lawn (O040594), 5 October 1999 and stream/pond (O038594), 31 May 1974, 30 April 1992, 9 June 2006 (all DAM). R. Nanny, road bridge u/s Duleek (O035655), 6 June 2006, DAM/WM (DAM). **MONAGHAN: HA 6** - L. Naglack, Carrickmacross (H853026), 3 May 2007, EPA (DAM). **OFFALY: HA 25** - R. Little Brosna, Ryan's Cross (S053882), 2 September 1982 (Hayes, 1991). **ROSCOMMON: HA 26** - L. Cavetown, Boyle (M832974), 11 June 2008, EPA (DAM). L. Key, Boyle (pier in Forest Park) (G848040), 11 June 2008, EPA (DAM). **SLIGO: HA 26** - L. Gara, Monastredan (M708996), 5 September 2008, EPA (DAM): **HA 34** - R. Moy, Cloonacool (G493168), 30 August 1982 (Hayes, 1991): **HA 35** - L. Gill (G782350), 11 June 2008, EPA (DAM). R. Easky, Easky (G377378), 19 August 1983 (Hayes, 1991). **TIPPERARY: HA 15** - R. Nore, Clonakenny (S116805), 27 August 1981 (Hayes, 1991): **HA 16** - R. Suir, Loughmore (S120670), 6 July 1992 (Murray and Lynch, 1992); Rossestown Bridge (S134624), 6 July 1992 (Murray and Lynch, 1992). **WESTMEATH: HA 25** - stream supply to fish farm, Cullion (N430557), May 1990 (Murray, 1990). R. Brosna, 25m d/s fish farm, Cullion (N431556), May 1990; 200m d/s fish farm, Cullion (N432556), May 1990 (all Murray, 1990). Royal Canal, Cullion (N424563), May 1990 (Murray, 1990): **HA 26** - L. Ree, Coosan (N050450), 15 August 2007, EPA (DAM). **WEXFORD: HA 11** - R. Ounvarra, Ballycanew (T153519), 6 May 2006, DAM/WM (DAM). **WICKLOW: HA 10** - R. Glencullen (Glencullen R.), Knocksink (O218180), 18 May 1987, DEM/DAM (Morgan, 1989).

***Conchapelopia (Conchapelopia) pallidula* (Meigen, 1818)**

**ANTRIM: HA 4** - R. Bush, Stranocum (D009307) and Ballyhoe Bridge (D077294), 2 July 2000 (Langton, 2002). R. Glendun, Drumfresky, Cushendun (D193308), 2 July 2000 (Langton,

2002). R. Glenariff, Cushendall (D215205), 2 July 2000 (Langton, 2002). **CORK: HA 18** - R. Blackwater, Duncannon (W180931), 2 September 1981 and Killavullen (W648998), 31 August 1981 (Hayes, 1991): **HA 20** - R. Bandon, u/s Ballineen (W331537), 30 June and 25 August 1980; Ballineen Bridge (W434538), 27 May and 25 August 1980; Castle Bernard (u/s Bandon) (W472546), 30 June 1980; 2.5km d/s Bandon (W516569), 27 May and 30 June 1980 (all Morgan, 1982). **DERRY: HA 2** - R. Owenbeg, Feeny (C645058), 26 June 2000 (Langton, 2002). R. Bessbrook, Limavady (C655212), 9 June 2000 (Langton, 2002). R. Roe, Deerpark Wood, Limavaddy (C682203), 9 June 2000 and Largy Bridge, Limavaddy (C681202), 14 July 2000 (Langton, 2002). Castle R., Ardmore Bridge, Limavady (C706207), 9 June 2000 (Langton, 2002). Burn at Largantea picnic area, Formoyle, Coleraine (C738287), 9 June 2000 (Langton, 2002): **HA 3** - Downhill beach stream, Coleraine (C754326), 9 June 2000 (Langton, 2002); Downhill Forest Stream, Coleraine (C759348), 25 July 1999 (PHL). R. Agivey, ford at Ballynameen (C827148), 14 June 2008 (PHL). R. Macosquin, Black Bridge, Ballylintagh (C854256), 26 May 2000 (Langton, 2002). R. Bann, Coleraine (C854304), 5 May 1999, 25 May 2000, 7 June 2000, 16 June 2001 (PHL). **DONEGAL: HA 36** - R. Erne, Ballyshannon (G878614), July 1993 (DAM): **HA 37** - R. Stragar, Duninkeely (G727792), 10 August 1982 (Hayes, 1991): **HA 38** - R. Tullaghobeg, Millmount (B933304), 12 August 1982 (Hayes, 1991): **HA 39** - R. Swilly (Swilly R.), Newmills, Letterkenny (C125092), 18 July 2000 (Langton, 2002). R. Crana, Buncrana (C347328), 15 August 1982 (Hayes, 1991). **DOWN: HA 3** - Upper R. Bann, New Bridge, Hilltown (J238288), 29 May 1998 (PHL). R. Carcullion, Hilltown (J213275), 18 June 1997 (PHL). R. Kinnahalla, Hilltown (J239292), 29 May 1998 (PHL). **DUBLIN: HA 9** - R. Dodder, Fort Bridge, Bohernabreena (O009242), 24 June 1968 and 23 August 1968 (Murray, 1972). **FERMANAGH: HA 36** - R. Colebrook, Killarbran Bridge, Killarbran (H416441), 4 June 1997 (PHL). R. Colebrook tributary, Raw (H424426), 3 October 1997 (PHL). **GALWAY: HA 30** - R. Cregg, Addergsole Bridge (M324350), 16 August 1981 (Hayes, 1991): **HA 31** - L. Nahasleam, Maam Cross, south (L972440), 7 June 2007, EPA (DAM): **HA 32** - R. Dawros, Tullywee Bridge, Letterfrack (L730586), 18 August 1981 (Hayes,

1991). **KERRY: HA 22** - Muckcross Lake, Dundag Bay (V964858), July 1973 (Douglas and Murray, 1980). R. Annascaul, Annascaul (Q593017), 2 July 1981 (Hayes, 1991). R. Clydagh, u/s Clydagh Bridge (W114826), June to August 1978 (Ashe, 1982). R. Flesk, d/s Clydagh/Loo confluence (W084814), Garries Bridge (W082835) and Flesk Bridge (W034876), June to August 1978 (Ashe, 1982); White Bridge (V987904), 29 May 1973 (Douglas and Murray, 1980); d/s Whitebridge (V987900), 21 July 1978, PA (Ashe, 1982; Murray, 2005), 10 August 1978, PJA (PJA/NMI); New Bridge, Killarney (V968896), 30 May 1973 (Douglas and Murray, 1980); d/s New Bridge (V963885), June to August 1978 (Ashe, 1982); u/s L. Leane (V964894), 27 July 1976, PJA (Murray, 2005), June to August 1978 (Ashe, 1982). R. Laune, Beaufort Bridge (V880920) and Ferry Bridge (V891912), July 1973 (Douglas and Murray, 1980). R. Loo, Aughnanus Bridge, Crohane (W045790), June to August 1978 (Ashe, 1982). R. Torc, above waterfall, Killarney (V964835), 1973 (Douglas and Murray, 1980). **LAOIS: HA 15** - R. Nore, Kilbricken (S362898), 27 August 1981 (Hayes, 1991). **LEITRIM: HA 35** - R. Owenmore, Manorhamilton (G881392), June 1991, JL/DAM (DAM). **MAYO: HA 32** - Westport L., Westport Woods Hotel, Westport (L985843), 7 May 2004, DAM/WM (DAM): **HA 33** - bog pool, Sraheen, Achill Island (F716005), 6 May 2004, DAM/WM (DAM). **MEATH: HA 7** - R. Boyne, Ardsallagh, adjacent St Bridget's Well (N897635), 7 July 1988 (Murray, 1988); Kilcarn Bridge, Navan (N884657), 21 August 1988 (Murray, 1988); Knowth Weir (N995720), 19 July 1989 (DAM): **HA 8** - R. Nanny, road bridge u/s Duleek (O035655), 6 June 2006, DAM/WM (DAM). **OFFALY: HA 25** - R. Little Brosna, Milltown Park (S068907), 2 September 1982 (Hayes, 1991). **SLIGO: HA 34** - R. Moy, Cloonacool (G493168), 30 August 1982 (Hayes, 1991): **HA 35** - R. Drumcliff, Glencar (G734430), 19 August 1983 (Hayes, 1991). **TYRONE: HA 1** - Dennet Stream, Essbeg Bridge, Lisnaskee (H384306), 27 June 2000 (Langton, 2002). **WESTMEATH: HA 26** - R. Shannon, Athlone (N005405), no date (Edwards, 1929). **WEXFORD: HA 12** - R. Slaney, Ballycarney (S967488), 29 July 1981 (Hayes, 1991). **WICKLOW: HA 10** - R. Glencullen, Knocksink (O218180), 18 May 1987, DEM/DAM (Morgan, 1989). R. Avonbeg, Meetings Bridge (T188831), 11 July 1997, FC/DAM and 27 Oct

1997, FC (Curran, 2001). R. Avonmore, Lion Arch Bridge (T194833), 11 July 1997, FC/DAM (Curran, 2001). R. Avoca, Whitebridge, Tigroney (T198821), 11 July 1997 (Curran, 2001); Avoca Village (T203802), 11 July 1997 (Curran and Murray, 2001) and October 1997 (Curran, 2001): **HA 12** - R. Derry, Bridgeland (T021744), 29 July 1981 (Hayes, 1991). R. Slaney, Stratford Bridge (S895930), 28 July 1981 (Hayes, 1991).

***Conchapelopia (Conchapelopia) viator* (Kieffer, 1911)**

**ANTRIM: HA 3** - R. Kells (Kells R.), Shank Bridge, Kells (J126982), 20 June 2000 (Langton, 2002). **CARLOW: HA 12** - R. Slaney, Motabower Bridge (S832778), Kilcarry Bridge (S893624) and Kildavin (S899597), 28 July 1981 (Hayes, 1991). R. Derreen, Acann Bridge (S900781), 29 July 1981 (Hayes, 1991). **CAVAN: HA 36** - R. Erne, Dingin's Bridge (N331948), 27 August 1982 (Hayes, 1991); R. Erne, Drumbarry (N462951), 17 August 1982 (Hayes, 1991). **CLARE: HA 28** - R. Annageeragh, Knocknaghila Bridge, d/s L. Doo (R057710), 9 July 1973, JPOC (DAM) and Moyglass Bridge (R078725), 30 July 1982 (Hayes, 1991). **CORK: HA 18** - R. Blackwater, Ballymacquirk Bridge, Banteer (W382989), 1 September 1981; Lombardstown (W463968), 1 September 1981; Killavullen (W648998), 31 August 1981 (all Hayes, 1991): **HA 20** - R. Bandon, Long Bridge, Dunmanway (W242631), 25 August 1980; Bealabouy Bridge, Dunmanway (W257514), 30 June, 25 August and 25 September 1980; u/s Ballineen (W331537), Ballineen Bridge (W434538),; Castle Bernard (u/s Bandon) (W472546) and 2.5km d/s Bandon (W516569), 27 May, 30 June, 25 August and 25 September 1980 (all Morgan, 1982). R. Ilen, Drimoleague (W098454), Madore (W103419) and Hollybrook (W117363), 24 August 1983 (Hayes, 1991). R. Ovane, Pierson's Bridge (W023454), 24 August 1983 (Hayes, 1991). **DERRY: HA 3** - R. Bann, Coleraine (C854304), 23 June 1999, 17 May 2000 to 7 June 2000 (PHL). **DONEGAL: HA 37** - R. Corabber, Grenna Bridge, above L. Eske (G976863), 22 August 1984 (DAM). R. Eany, d/s Eanybeg confluence (G842815), 10 August 1982 (Hayes, 1991): **HA 38** - R. Devlin, Dunlewy (B927190), 19 July 2000 (Langton, 2002). R. Owenveagh, Glenbeagh Cottage, Glenveagh (B990178), 30 June

1985 (Heneghan, 1986). Owenacally stream, Glenveagh (C043226), 19 July 2000 (Langton, 2002). R. Owencarrow, d/s road bridge, Glenveagh (C043235), 18 July 2000 (Langton, 2002). **GALWAY: HA 31** - L. Ballynahinch, Ballynahinch (L777478), 6 June 2007, EPA (DAM). R. Owentouey, Tullywee Bridge, Recess (L873474), 18 August 1981 (Hayes, 1991). **KERRY: HA 18** - R. Blackwater, Lacknastooka (R153008), 2 September 1981 (Hayes, 1991): **HA 22** - R. Caragh, Blackstones Bridge, d/s R. Acoose confluence (V710864) and at L. Caragh outflow (V713924), 4 August 1975, CD (Dowling *et al.*, 1981). R. Clydagh, u/s Clydagh Bridge (W114826), June to August 1978 and 1979 (Ashe, 1982). R. Flesk, d/s Clydagh/Loo confluence (W084814), Garries Bridge (W082835) and Flesk Bridge (W034876), June to August 1978 and 1979 (Ashe, 1982); White Bridge (V987904), 29 May 1973 (Douglas and Murray, 1980); d/s Whitebridge (V987900), 1 August 1974 (Murray, 2005), 26 July 1976, PJA (DAM), June to August 1978 (Ashe, 1982); u/s L. Leane (V964894), June to August 1978 (Ashe, 1982); R. Flesk, d/s New Bridge (V963885), June to August 1978 (Ashe, 1982). R. Laune, Beaufort Bridge (V880920), July 1973 (Douglas and Murray, 1980). R. Loo, Aughnanus Bridge, Crohane (W045790), June to August 1978 (Ashe, 1982). **KILDARE: HA 9** - R. Liffey, Sallins (N881245), 17 July 1983 (Hayes, 1991). **LEITRIM: HA 35** - R. Owenmore, Manorhamilton (G881392), June 1991, JL/DAM (DAM). **MAYO: HA 32** - L. Doo, Delphi, west shore (L835681), 12 July 2006, EPA (DAM). R. Carrowinsky, Killeen, Carrowinsky (L770773), 5 August 2004, DAM/WM (DAM). R. Bunowen, Louisburg (L807807), 5 August 2004, DAM/WM (DAM). **MEATH: HA 7** - R. Boyne, Bellinter Bridge (N894625), 23 July 1968 (Murray, 1972); Slane Bridge (N965737), Knowth Weir (N995720) and d/s Oldbridge (O062753), 19 July 1989 (DAM). **ROSCOMMON: HA 26** - R. Suck, Castlecoote (M809627), 16 July 1981; Athleague (M825758) and Mount Talbot (M813531), 14 August 1981; Ballyforan (M817464), 16 July 1981 and 28 July 1982; Newtown (M844346), 15 August 1981 (all Hayes, 1991). **SLIGO: HA 34** - R. Moy, Cloonacool (G493168), 30 August 1982 (Hayes, 1991). **WEXFORD: HA 12** - R. Boro, Dunamore Bridge, Enniscorthy (S963366), 29 July 1981 (Hayes, 1991). R. Slaney, Clomahon (S933534) and Ederline Bridge (S977345), 29 July 1981

(Hayes, 1991). **WICKLOW: HA 10** - R. Glencullen, Knocksink (O218180), 13 July 1987 (Gavin, 1986) and 18 May 1987, DEM/DAM (Morgan, 1989). Outflow from Upper Glendalough Lake, Laragh, WMNP (T109964), 16 July 1996, EMcE/DAM (McEntee, 1997). R. Avonmor, Laragh Bridge (T144965), 24 June 1996, MKQ (DAM): **HA 12** - R. Slaney, Knickeen, Glen of Imaal (S987948); Knockgarrigan, Glen of Imaal (S936937) and Kilmurray (S889856), 28 July 1981 (Hayes, 1991).

***Guttipelopia guttipennis* (van der Wulp, 1861)**

**KERRY: HA 22** - L. Doo (Doolough), Muckross Peninsula (V949860), 5 July 1973, DAM (Douglas and Murray, 1980; Murray, 2005). **WATERFORD: HA 16** - L. Ballyscanlan (Ballyscanlan Reservoir), Tramore (S540030), 19 August 2009, EPA (DAM).

***Krenopelopia binotata* (Wiedemann, 1817)**

**DONEGAL: HA 38** - R. Ray, Muckish Gap (B993268), 12 August 1982 (Hayes, 1991). **DUBLIN: HA 9** - railway foot bridge, Blackrock (O220294), 5 June 1968, DAM (Murray, 1972).

***Krenopelopia nigropunctata* (Staeger, 1839)**

**GALWAY: HA 31** - L. Shindilla, Derreennacreeva, Maam Cross (L958460), 16 May and 20 June 2006, EPA (DAM). **LOUTH: HA 6** - Tinure Marsh, Collon (O020835), 14 May 1985, BH (Murray, 2005). **MAYO: HA 32** - R. Altahoney, Newport (F950050), 1968-1971, EF (Fahy and Murray, 1972): **HA 33** - stream, Keem, Achill Island (F561045), 5 August 2004, DAM/WM (DAM): **Clare Island** - coastal roadside, Bayview Hotel (L717857), 20 August 2002 (Murray and Murray, 2003). **MEATH: HA 8** - pond, Meadesbrook, Kilmoon (O038594), 14 June 1968 (Murray, 1972).

***Labrundinia longipalpis* (Goetghebuer, 1921)**

**GALWAY: HA 31** - L. Anaserd, Ballyconneely, 20 June and 10 July 2006, 6 June and 17 July 2007, EPA (Murray, 2010).

***Larsia atrocincta* (Goetghebuer, 1942)**

**CLARE: HA 27** - L. Cullaun, Corrofin (mid east shore) (R317905), 4 July 2006, EPA (EPA). **DONEGAL: HA 38** - L. Glen, Glen (C105292), 29 July 2009, EPA (DAM): **HA 39** - L. Gartan, Church Hill (C055159), 22 July 2009, EPA (DAM). L. Gartan, Church Hill, north shore (C065173), 18 July 2000 (Langton, 2002). **GALWAY: HA 31** - L. Ballynahinch, Ballynahinch (L777478), 6 June 2007, EPA (DAM). **KERRY: HA 22** - L. Guitane, Crohane, Killarney (W025846), 8 July 2008, EPA (DAM). Muckcross Lake, Killarney, Dundag Bay (V964858), 12 July 1972 (Murray, 1974) and July 1973 (Douglas and Murray, 1980). R. Caragh, d/s Owenroe confluence (V720815), Bealalaw Bridge (V715832) and Blackstones Bridge, d/s R. Acoose confluence (V710864), 1975, CD (Dowling *et al.*, 1981). R. Loo, Aughnanus Bridge, Crohane (W045790), July to August 1978 and 1979 (Ashe, 1982). **LEITRIM: HA 35** - L. Annary, Dromahair (G817338), 10 June 2008, EPA (DAM). **LIMERICK: HA 24** - Bleach L., Pallaskenry (R441569), 13 June 2009, EPA (DAM). **MAYO: Clare Island** - Creggan L., Lecarrow (L689857), July to October 1998 and June to October 1999 (Fahy, 2002). L. Poirtin Fuinch (L706857), 10 June 1999 (Fahy, 2002). **MEATH: HA 7** - R. Boyne, Ardsallagh, adjacent to St Bridget's Well (N897635), 16 June 1974, 8 June and 15 June 1980 and 16 August 1984, (DAM). **SLIGO: HA 35** - L. Gill, Sligo (G782350), 11 June 2008, EPA (DAM).

***Larsia curticalcar* (Kieffer, 1918)**

**GALWAY: HA 30** - L. Anillaun, Maam Cross (L980470), 8 June 2007, EPA (DAM): **HA 31** - L. Shindilla, Derreennacreeva, Maam Cross (L958460), 7 June 2007, EPA (DAM). **KERRY: HA 22** - L. Cummernamuck, Killorglin (V745897), 9 September 2008, EPA (DAM). **MAYO: HA 32** - L. Nahaltora, Cregganbaun (L794745), 30 September 2004, DAM/WM (DAM): **HA**

33 - bog pool, R. Glenamoy basin, Glenamoy (F896345), 18 August 1972, CD (Murray, 2005).

***Macropelopia (Macropelopia) adauca* Kieffer, 1916**

**ANTRIM: HA 3** - L. Neagh, Lennymore Bay (J115745), March 1969 (Marks and Henderson, 1970). **CLARE: HA 27** - Gortglass L., Killydysart (R223599), 30 September 1964 (Murray, 1972). L. Muckanagh, Tubber, Corrofin (R370922), 14 September 2009, EPA (DAM): **HA 28** - L. Acrow, Lisscasey (R193687), 4 September 2006, EPA (DAM). L. Keagh, Milltown Malbay, north shore (R100813), 15 September 2009, EPA (DAM) and 19 September 2012 (DAM). Quarry pond near L. Keagh (R097809), 19 September 2012 (DAM). L. Naminna, Boolteagh (R180710), 15 September 2009, EPA (DAM). **CORK: HA 19** - L. Gouganebarra, Inchegeelagh (W009060), 3 May 1966 (Murray, 1972): **HA 20** - L. Skeagh (Schull Reservoir), Schull (V937338), 27 August and 17 September 2008, EPA (DAM). L. Tooreen, Crookhaven (V790259), 17 September 2008, EPA (DAM). R. Bandon, Ballineen Bridge (W434538), 25 August 1980, GM (Morgan, 1982): **HA 21** - L. Glenbeg, Ardgroom (V706530), 3 September 2008, EPA (DAM). **DERRY: HA 2** - pond, Binevenagh, Coleraine (C691305), 25 August 2001 (PHL): **HA 3** - Howell's Tarn, Ballywildrick, Coleraine (C766325), 7 April and 21 April 2002 (PHL). Glenullin Bog, R. Agivey catchment, Garvagh (C795132), 7 June and 29 June 2008 (PHL). **DONEGAL: HA 1** - L. Finn, Fintown, Glenties (B911018), 23 July 2009, EPA (DAM): **HA 37** - Carn L., Blue Stack Mountains (G871886), 27 July 2005, JRB (DAM). R. Stragar, Killybegs (G730787), 23 August 1984 (DAM). L. Shinvagh, Carricode (H005675), 27 April 2002 (PHL): **HA 38** - L. Dunglow, west shore, Dunglow (B782119), 17 June and 5 August 2009, EPA (DAM). L. Anure, east shore, Loughanure (B818162), 17 June and 7 September 2009, EPA (DAM). L. Nabuckan, Grogan More (B850184), 27 July 2005, JRB (DAM). L. Nasnahida, Doocharry, Dunglow (B852076), 6 August 2009, EPA (DAM). L. Dunlewey, Dunlewey (B926193), 19 July 2000 (Langton, 2002). L. Barra, Commeen (B935119), 10 June 2009, EPA (DAM). L. Veagh, Glenveagh, south shore (C002187), 16 August 1985; Derrylahane, north west shore (C037233), 24 July 1985, POD (Heneghan, 1986); north east



shore, 22 August 1985 (Heneghan, 1986) and 27 June 1988, DAM (DAM). Bog pool, Glenveagh (C040203), 24 May 1986 (Heneghan, 1986). L. Nadourcan, Glenveagh (C054228), 18 July 2000 (Langton, 2002). L. Voriskey, The Rosses (B762176), 19 July 2000 (Langton, 2002): **HA 40** - L. Naminn, Cloonmany (C400423), 18 August 2011 (PHL). Bog pool, Rowantree Hill, Moville (C551401), 18 August 2011 (PHL). **DOWN: HA 3** - R. Shanky, Batts Bridge, Hilltown (J226257), 26 September 1997 (PHL). R. Rocky, Hilltown (J242268), 28 September 1998 (PHL). Glenaveagh stream, Glenaveagh Bridge (J255284), 28 August 1998 (PHL). **DUBLIN: HA 9** - Upper Reservoir, Bohernabreena (O095219), 2 April and 26 June 1947 (Fitzgerald, 1947). Bog pool, Featherbed (O115217), 26 July 1949 (Reilly, 1951); bog pool, Featherbed (O120190), March 1974, CD (Dowling, 1975; Dowling and Murray, 1981). **FERMANAGH: HA 36** - L. Atona, Cuilcagh Mountain (H110294), 29 June 2000 (Langton, 2002). **GALWAY: HA 30** - L. Anillaun, Maam Cross (L980470), 19 April, 8 June and 5 September 2007, EPA (DAM). L. Beaghcauneen, Ballinaboy (L679470), 18 July 2007, EPA (DAM). L. Lettercraffroe, Oughterard (M056376), 18 April 2007, EPA (DAM). Stream, Moycullen on N59 road (M204326), 25 May 2003 (PHL): **HA 31** - L. Anaserd, Ballyconneely (L605443), 11 September 2007, EPA (DAM). L. Ardderry, Maam Cross (L998458), 25 May 2003 (PHL). L. Ballynahinch, Ballynahinch (L777478), 17 April, 6 June and 13 September 2007, EPA (DAM). L. Derryclare, Recess (L825485), 17 April and 16 July 2007, EPA (DAM). L. Illauntrasna, Glentrasna, Garomna (L888254), 25 July and 12 September 2007, EPA (DAM). L. Loughanaure, Kilkieran (L828320), 7 June, 24 July and 12 September 2007, EPA (DAM). L. Nahasleam, Maam Cross (L972440), 16 May 2006, 19 April, 7 June and 13 September 2007, EPA (DAM). L. Shindilla, Derreenacreeva, Maam Cross (L958460), 7 June 2007, EPA (DAM): **HA 32** - L. Ballynakill, Cleggan (L639581), 11 September 2007, EPA (DAM). L. Enask, Beaghcauneen (L662468), 4 April 2007, 6 June and 17 September 2007, EPA (DAM). L. Fadda, Beaghcauneen (L668455), 17 July and 11 September 2007, EPA (DAM). L. Pollacappul, Kylemore (L754582), 9 July 2007, EPA (DAM). **KERRY: HA 21** - L. Cloonaghlin, Waterville (V611708), 10 September 2008, EPA (DAM). Eagles L.,

Knocknagantee (V674728), 9 August 2005, JRB (DAM). Erik L., Derrygarriff (V881777), 9 August 2005, JRB (DAM). L. Inchiquin, Kenmare (V837629), 1 September and 17 September 2008, EPA (DAM): **HA 22** - bog pool, Cummeenduff Glen (V825813), 27 August 1987(DAM). L. Cummernamuck, Killorglin (V745897), 9 September 2008, EPA (DAM). L. Guitane, Crohane, Killarney (W025846), 3 July 1973 (Douglas and Murray, 1980) and 8 July 2008, EPA (DAM). Killarney, no location (V9386), 1929, FWE (Edwards, 1929). L. Leane, Killarney (V931886), 22 April and 18 September 2008, EPA (DAM); Mahony's Point (V932912), July 1973 (Douglas and Murray, 1980). Muckcross Lake, Killarney (V950853), 24 April and 18 September 2008, EPA (DAM); Muckcross Lake, Dundag Bay (V964858), 12 July 1972 (Murray, 1974), July 1973 (Douglas and Murray, 1980). R. Annascaul, Annascaul (Q593017), 9 April 1981, BPH (DAM). R. Clydagh, u/s Clydagh Bridge (W114826), 15 September 1976 (Ashe, 1982). R. Torc, above waterfall, Killarney (V964835), 24 August 1973 (DAM): **HA 23** - L. Cam, Castlegregory (Q597079), 29 April, 25 June and 18 September 2008, EPA (DAM). **LEITRIM: HA 26** - L. Natire (G966340), 3 August 2005, JRB/MC (DAM): **HA 35** - L. Lackagh, Boleybrack (G920320), 3 August 2005, JRB (DAM). L. Nabrack, Crocknagapple (G860477), 29 April 2005, JRB (DAM) and 4 August 2005, JRB/MC (DAM). L. Sandy, Crocknagapple (G891448), 4 August 2005, JRB/MC (DAM). **MAYO: HA 30** - L. Carra, Keel Bridge, Ballinrobe (M165680), 28 April 2008, EPA (DAM): **HA 32** - L. Glencullin, north west shore, Delphi (L815699), 26 June 2008, EPA (DAM). L. Nahaltora, Cregganbaun (L794745), 30 September 2004, DAM/WM (DAM). Pond, Laghta (L845759), 7 May 2004, DAM/WM (DAM). L. Fin, Delphi (L841657), 28 June 2006, EPA (DAM). L. Moher, Liscarney, Westport (L977766), 21 April 2008, EPA (DAM); Carrickvegraly Point, Roonagh (L743806), 27 April 2000, DAM/WM (Murray and Murray, 2003); south of Roonagh Pier (L744808), 27 July 2000, DAM/WM (DAM): **HA 33** - L. Acorrymore, Achill Island (F578057), 7 April and 17 June 2008, EPA (DAM). L. Bunacurry (Bunacurry Lake), Achill Island (F695048), 29 September 2004, DAM/WM (DAM). Bog pool, Achill Island (F712008), 5 August 2004, DAM/WM (DAM). Bog pool, Sraheen, Achill Island (F716005), 6 May 2004, DAM/WM (DAM). Pool,

Campport Bay, Achill Island (L677982), 29 September 2004, DAM/WM (DAM). L. Carrowmore, Derreens, Bangor Erris (F833299), 28 July 2008, EPA (DAM). Bog pool, Glenamoy basin, Glenamoy (F896345), April to July 1973, CD (Dowling, 1975; Dowling and Murray, 1981): **Clare Island** - seepage, south of lighthouse (L695879), 20 August 2002. Pond east of Maum road, (L710863), 28 April 2000. First order stream, west of Maum road (L711861), 5 June 2002. Between Maum and Capnagower (L712857), 20 August 2002. Roadside, Bayview Hotel (L716856), 28 April 2000. Bog pool, Knockmore (L683857), 21 August 2002. Pond east of Signal Tower (L658859), 21 August 2002, DAM/WM (all Murray and Murray, 2003). **TIPPERARY: HA 18** - Black L., Arra Mountains (R738771), 10 August 2005, JRB (DAM). **TYRONE: HA 1** - L. Oak, Gortin, Newtownstewart (H498843), 16 August 2011 (PHL). **WICKLOW: HA 9** - bog pool, Featherbed Mountain, Sally Gap (O130113), 20 May 1947, CFH (DAM); 8 July 1984, CCO (Gavin, 1989) and 10 September 1996, DAM (Murray, 2005): **HA 10** - L. Ouler, Tonelagee (O091023), 8 August 2005, JRB (DAM).

***Macropelopia (Macropelopia) nebulosa* (Meigen, 1804)**

**ANTRIM: HA 3** - Glenravel Water, Gartnageeragh, Newtown Crommelin (D147154), 2 July 2000 (Langton, 2002). L. Neagh, Lennymore Bay, north (J115745), 1966, R. J. Marks (Marks and Henderson, 1970). Reservoir, Killylane, Magherabane, Larne (J292985), 8 May 1999 (PHL): **HA 4** - R. Bush, Seneirl Bridge (C943362), 16 July 2000 (Langton, 2002); Conogher Bridge (C963305), 10 September 2000 (Langton, 2002); Stranocum (D009307), 2 July 2000 (Langton, 2002); Ballyhoe Bridge (D077294), 2 July 2000 (Langton, 2002). Pool at Ballyhoe Bridge (D077294), 2 July 2000 (Langton, 2002). Benvarden Pond, Benvarden Garden, Derrykeegan (C946334), 15 May 2005 (PHL). Pool at Fair Head (D185433), 21 March 1999 (PHL): **HA 5** - L. Mourne, Carrickfergus (J415924), 4 May and 8 May 1999 (PHL). **CAVAN: HA 36** - R. Erne, Drumbarry (N462951), 17 August 1982 (Hayes, 1991). **CLARE: HA 25** - Bleach R., Corlea Bridge (R605965), 3 September 1973, JPOC (DAM). L. Derg (Shannon), d/s Killaloe (M705715), 17 June and 18 September 2009, EPA (DAM). L. Graney, Drumandora,

west shore (R553938), 15 June 2009, EPA (DAM): **HA 27** - L. Bunny, south east shore, Aughrim (R377965), 6 April 2006 and 5 September 2006, EPA (EPA): **HA 28** - L. Keagh, Milltown Malbay, north shore (R100813), 15 September 2009, EPA (DAM). **CORK: HA 19** - Carrigdroihid Reservoir, Ashton (W360703), 3 April 2008, EPA (DAM): **HA 20** - R. Bandon, Long Bridge, Dunmanway (W242631), 20 March, 25 August and 25 September 1980; Bealabouy Bridge, Dunmanway (W257514), 20 February and 20 March 1980; u/s Ballineen (W331537), 20 February, 20 March, 25 August and 25 September 1980; Ballineen Bridge (W434538), 25 August and 25 September 1980; Castle Bernard (u/s Bandon) (W472546), 20 March, 18 April, 25 August, 25 September and 31 October 1980; 2.5km d/s Bandon (W516569), 18 April, 25 August, 28 November 1980 (all Morgan, 1982): **HA 21** - L. Glenbeg, Ardgroom (V706530), 3 September 2008, EPA (DAM). **DERRY: HA 1** - pool, Creggan, Derry (C414171), 17 May 2002 (PHL). Lower Reservoir, Creggan, Derry (C422174), 26 April and 10 May 2001 (PHL): **HA 2** - R. Bessbrook, Limavady (C655212), 9 June 2000 (Langton, 2002). Pool, Roe Valley Park, Limavady (C679201), 9 June and 14 July 2000 (Langton, 2002). R. Roe, Largy Bridge, Limavaddy (C681202), 14 July 2000 (Langton, 2002). Binevenagh pond, Coleraine (C691305), 16 September 2000 and 25 August 2001 (PHL). Fire dam 1 Binevenagh Forest, Coleraine (C699304), 18 May 2000 (Langton, 2002). Castle R., Ardmore Bridge, Limavady (C706207), 9 June 2000 (Langton, 2002): **HA 3** - Downhill beach stream, Coleraine (C754326), 9 June 2000 (Langton, 2002); Downhill pond, Lions Gate, Coleraine (C762357), 22 June 2000 (Langton, 2002); Downhill Forest lake, Coleraine (C757354), 17 March and 28 July 1999, 24 March 2002 (PHL); Downhill Forest stream, Coleraine (C759348), 25 July 1999, 24 March 2002 (PHL). Howell's Tarn, Ballywildrick, Coleraine (C766325), 22 April 2001, 17 April, 21 April, and 7 July 2002 (PHL). Balinrees Reservoir, Coleraine (C794300), 9 June 2000 (Langton, 2002). Inflow to Balinrees Reservoir, Coleraine (C793307), 20 March 1999 (PHL). R. Bann, Newferry, d/s L. Beg (H990983), 13 October 2000 (Langton, 2002). Coleraine (C854304), 12 April 1999 to 1 October 1999, 6 April 2000 to 3 December 2000, 26 April and 30 June 2001, 18 April 2005, 8 April 2010 and 27 July 2012 (PHL). L. Neagh, unspecified

(H9080), no date (McLarnon and Carter, 2000). R. Moyola, New Bridge, Magherafelt (H955905), 4 July 2000 (Langton, 2002) and 7 May 2001 (PHL). **DONEGAL: HA 1** - L. Finn, Fintown, Glenties (B911018), 23 July 2009, EPA (DAM): **HA 36** - L. Tullynasiddagh, Ballyshannon (G983656), 7 September 2009, EPA (DAM). L. Vearty, Ballyshannon (G995658), 7 September 2009, EPA (DAM): **HA 37** - R. Stragar, Killybegs (G730787), 23 August 1984 (DAM): **HA 38** - L. Nasnahida, Doocharry, Dunglow (B852076), 10 September 2009, EPA (DAM). L. Dunlewy, Dunlewy (B926193), 19 July 2000 (Langton, 2002). Pool, Sliev Snacht, GNP (B933153), 4 June 1986 (Heneghan, 1986). L. Greenan, Loughsalt, Kilmacrennan (C117262), 14 July 2009, EPA (DAM). L. Shannagh, Magheradrumman, Fanad Peninsula (C216450), 9 September 2009, EPA (DAM): **HA 40** - bog pool, Rowantree Hill, Merville (C551401), 18 August 2011 (PHL). R. Keenagh, Keenagh Bridge (C435555), 18 August 2011 (PHL). **DOWN: HA 3** - Upper R. Bann tributary, Tullyconnaught (J166451), 19 September 1997 (PHL); Upper R. Bann tributary, Hilltown Church (J210294), 27 March 1998 (PHL); Upper R. Bann, Katesbridge (J210407), 27 August 1998 (PHL); Upper R. Bann tributary, Tirkelly (J223364), 19 September 1997, (PHL); Upper R. Bann tributary, Shanrod House, Shanrod (J207439), 19 September 1997 and 14 August 1998 (PHL). R. Muddock, Muddock Bridge, Rathfriland (J235342), 19 September 1997 (PHL). R. Shanky, Hilltown (J221243), 26 September 1997 (PHL). **DUBLIN: HA 9** - pond, University College Dublin, Belfield (O185300), 20 March and 25 April 1973 (DAM). R. Dodder, Clonskeagh Bridge (O174306), 1946 (Grey, 1946). **FERMANAGH: HA 35** - L. Melvin, Garrison (G938518), 29 June 2000 (Langton, 2002). Glen R., Garrison (G943522), 29 June 2000 (Langton, 2002): **HA 36** - L. Erne, Lower, Boa Island (H108626), 29 June 2000 (Langton, 2002); Lower, Black Bay (H072639), 27 April 2002 (PHL). R. Finn, Lisnanesnagh Bridge, Rosslea (H544337), 26 June 2000 (Langton, 2002). R. Hollybrook, Lisnaskea (H373310), 27 June 2000 (Langton, 2002). Stream, Lisnaskea (H384306), 27 June 2000 (Langton, 2002). R. Colebrook tributary, Raw (H424426), 3 October 1997 and 24 September 1998 (PHL): **HA 36** - Many Burns R., Coolrakelly (H387459), 24 June 1997 (PHL). **GALWAY: HA 26** - R. Tirur, Newbridge

(M492699), 16 August 1981 (Hayes, 1991): **HA 30** - L. Corrib, no location (M1545), 1980, BC (DAM); L. Corrib Lower, Moycullen (M271360), 18 September 2007, EPA (DAM). L. Ross, Moycullen (M188365), 13 April 2007, EPA (DAM): **HA 31** - L. Ballynahinch, Ballynahinch (L777478), 13 September 2007, EPA (DAM). R. Owentouey, Tullywee Bridge, Recess (L873474), 18 August 1981 (Hayes, 1991): **HA 32** - L. Kylemore, Letterfrack (L771582), 10 September 2007, EPA (DAM). CNP, Letterfrack (L715575), 17 September 1986 (Heneghan, 1987). **KERRY: HA 22** - Muckcross Lake, Muckcross, Killarney (V950853), 18 September 2008, EPA (DAM). R. Annascaul, Annascaul (Q593017), 2 July 1981 (Hayes, 1991). R. Clydagh, Caherbarnagh (W202842), April to October 1978 (Ashe, 1982); u/s Clydagh Bridge (W114826), April to October 1978 (Ashe, 1982); Knocknagowan (W187837), April to October 1978 and 1979 (Ashe, 1982). R. Flesk, d/s of R. Clydagh and R. Loo confluence (W084814), April to October 1978; Garries Bridge (W082835), April to October 1978 (Ashe, 1982); Flesk Bridge (W034876), April to October 1978 (Ashe, 1982); White Bridge (V987904), 25 July 1974, DJD/DAM (DAM); d/s Whitebridge (V987900), 8 August 1978 (Ashe, 1982); u/s L. Leane (V964894), April to October 1978 (Ashe, 1982); d/s New Bridge (V963885), April to October 1978 (Ashe, 1982); R. Loo, Aughnanus Bridge, Crohane (W045790), April to October 1978 (Ashe, 1982). **KILDARE: HA 9** - R. Liffey, Straffan Bridge (N924293), 15 July 1983 (Hayes, 1991). R. Rye, Kildare Bridge, Carton (N948387), 13 July 1983 (Hayes, 1991). **LEITRIM: HA 26** - L. Allen, Mountallen, Drumshanbo (G950145), 9 September 2008, EPA (DAM): **HA 26** - L. Boderg, Dromod (N020910), 25 June 2008, EPA (DAM): **HA 35** - R. Owenmore, Manorhamilton (G881392), June 1991, JL/DAM (DAM). **LIMERICK: HA 25** - R. Mulkear, Cappamore (R775514), 8 September 1981 (Hayes, 1991). **MAYO: HA 30** - L. Aille, Aille, Westport (M071807), 18 September 2008, EPA (DAM). L. Mask, west shore, Toormakeady (M097647), 14 April and 22 September 2008, EPA (DAM): **HA 32** - L. Doo, Delphi, north east shore (L834689), 22 August 2002, DAM/WM (DAM). L. Glencullin, Delphi, north shore (L818711), 22 September 2008, EPA (DAM). L. Nahaltora, Cregganbaun (L794745), 30 September 2004, DAM/WM (DAM). Mulranny (L840965), July 1911

(Grimshaw, 1912): **HA 33** - L. Keel, south west shore, Achill Island (F641055), 17 September 2008, EPA (DAM). Bog pool, Achill Island (F712008), 5 August 2004, DAM/WM (DAM). Achill Island, north east (F7207), 1910 (Grimshaw, 1912); Glendarary, Achill Island (L723997), July 1911 (Grimshaw, 1912). L. Carrowmore, Cloontakilla Bay, Bangor Erris (F851253), 17 June 2008, EPA (DAM). Bog pools, Glenamoy (F896345), April 1973, CD (Dowling, 1975; Dowling and Murray, 1981): **HA 34** - L. Cullin, Drummon Wood (G235046), 18 June 2008, EPA (DAM): **Clare Island** - no location data (L6885), 1910, PHG (Grimshaw, 1912). **MEATH: HA 6** - R. Dee, Drumconrath (N910894), 27 July 1983 (Hayes, 1991): **HA 7** - R. Boyne, Ballyboggan (N638402), June 1989, JL/DAM (Murray and Lynch, 1991); adjacent to St Bridget's well, Ardsallagh (N897635), 7 July 1988 (Murray, 1988); Stackallen Bridge (N917713), 19 July 1989 (DAM); Oldbridge (O045761), 19 July 1989 (DAM); d/s Oldbridge (O062753), 19 July 1989, (DAM). Artificial tank, Ardsallagh, Navan (N896635), 2 April 2000 (Murray, 2005); marsh, Ardsallagh (N893639), 18 May 1986 (DAM). R. Blackwater, Sedenrath Bridge (N762759), 30 March 1976 (O'Flaherty, 1976). Interceptor ditch at tailings ponds, Randalstown, Navan (N857717), 22 June 1995 (Finnegan, 1998); tailings pond, Randalstown, Navan (N845714), 12 September 1994, 10 May 1995 and 29 August 1995 (Finnegan, 1998): **HA 8** - Meadesbrook, garden, Kilmoon (O040594), 11 April 1995, 28 September 2001 (DAM); Meadesbrook stream-pond, Kilmoon (O038594), 24 May 2006 (DAM). **MONAGHAN: HA 6** - L. Naglack, Carrickmacross (H853026), 3 May 2007, EPA (DAM). **OFFALY: HA 25** - R. Little Brosna, Myrtlegrove (S051852), 2 September 1982 (Hayes, 1991). **ROSCOMMON: HA 26** - R. Suck, Ballyforan (M817464), 16 July 1981 (Hayes, 1991). L. Funshinagh, Brideswell (M933513), 13 June and 11 September 2007, EPA (DAM). **SLIGO: HA 34** - R. Moy, Cloonacool (G493168), Metal Bridge, Tobercurry (G464138) and Annagh (G466123), 30 August 1982 (Hayes, 1991). **TIPPERARY: HA 16** - R. Drish, Boolabeha Bridge (S190619) and Athlummon Bridge (S177593), 6 July 1992 (Murray and Lynch, 1992). R. Suir, Loughmore (S120670), 22 May 1992 (Murray and Lynch, 1992): **HA 18** - L. Curra, Galtymore Mountain (R867242), 10 August 2005, JRB (DAM): **HA 25** - R. Kilmastulla, Kilmastulla Bridge

(R728698), 3 September 1981 (Hayes, 1991). **WATERFORD: HA 17** - Belle Lake, Dunmore East (S665049), 2 July 2009, EPA (DAM). **WICKLOW: HA 10** - outflow from Upper Glendalough Lake, Laragh, WMNP (T109964), 16 July 1996, EMcE/DAM (McEntee, 1997).

***Macropelopia (Macropelopia) notata (Meigen, 1818)***

**DONEGAL: HA 1** - L. Mourne, Ballybofey (H069900), 8 September 2009, EPA (DAM): **HA 38** - L. Dungloe, south east shore (B783112), 12 August 1982, BPH (Murray, 2005). L. Keel, Crolly (B848162), 17 June and 13 August 2009, EPA (DAM). R. Owenveagh, Ballaghgeeha, Glenveagh (B970160), 29 July 1985 (Heneghan, 1986). **DUBLIN: HA 9** - R. Dodder, headwater (O125187), 10 June 1968 (DAM). **GALWAY: HA 25** - R. Woodford, Woodford (M732000), 24 May 2003 (PHL): **HA 30** - L. Corrib (M150450), September 1964 (Murray, 1972): **HA 31** - L. Loughanaure, Kilkieran (L828320), 16 April 2007, EPA (DAM): **HA 32** - L. Enask, Beaghcauneen (L662468), 17 September 2007, EPA (DAM). L. Fadda, Beaghcauneen (L668455), 11 September 2007, EPA (DAM). CNP, Letterfrack (L715575), 17 September 1986 (Heneghan, 1987). **KERRY: HA 22** - L. Cummernamuck, Killorglin (V745897), 9 September 2008, EPA (DAM). L. Leane, Killarney, Victoria Bay (V946900), July 1973 (Douglas and Murray, 1980). Muckcross Lake, Killarney, Kilbeg Bay (V960860), July 1973 (Douglas and Murray, 1980). R. Laune, Beaufort Bridge (V880920), June 1973 (Douglas and Murray, 1980). Upper Lake, Killarney (V909821), 9 September 2008, EPA (DAM). **MAYO: HA 30** - L. Mask, Cushlough Pier, Ballinrobe (M153650), 11 August 1964 (Murray, 1972): **HA 32** - R. Bunowen, Louisburg, u/s of bridge (L807807), 5 August 2004 (Murray, 2005). R. Altahoney, Newport (F950050), 1968-1971, EF (Fahy and Murray, 1972): **HA 33** - bog pools, Glenamoy (F896345), April 1973, CD (Dowling, 1975; Dowling and Murray, 1981): **HA 34** - L. Conn, Cloghans (G205133), 18 April 1966 and Gillaroo Bay, Massbrook (G175051), 17 October 1964 (Murray, 1972): **Clare Island** - pond east of Maum road (L710863), 20 August 2002 (Murray and Murray, 2003). Creggan L., Lecarrow (L689857), 11 June and 5 October 1998, 10 June, 7 July and 13 August 1999 (Fahy, 2002). Small tank, Knockaveen (L705856), 21 August 2002



(Murray and Murray, 2003). **MEATH: HA 7** - R. Boyne, Ardsallagh, adjacent to St Bridget's Well (N897635), 16 June 1974 (DAM): **HA 8** - Meadesbrook stream-pond area, Kilmoon (O038594), 9 June 2006 (DAM). **WESTMEATH: HA 25** - L. Ennell, Tudenham (N415466), 29 June 1966 (Murray, 1972). **WICKLOW: HA 10** - Glencree Stream, Stonecross (O141185), May 1967 (Murray, 1972). Reservoir, east shore, Roundwood (O214002), 12 July 1983, HD (DAM).

***Macropelopia (Macropelopia) Pe1 sensu Langton and Viser, 2003***

**KERRY: HA 23** - L. Cam, Castlegregory (Q597079), 29 April 2008, EPA (Murray, 2010).

***Macropelopia (Macropelopia) spec. Norwegen (?rossaroi Lencioni and Marziali, 2005)***

**CLARE: HA 28** - L. Keagh, Milltown Malbay (R100813), 15 September 2009, EPA and 19 September 2012, DAM (Murray, 2012).

***Monopelopia (Monopelopia) tenuicalcar (Kieffer, 1918)***

**CORK: HA 21** - L. Mor, Adrigole (V870500), 28 August 1968 (Murray, 1972). **DONEGAL: HA 38** - duck pond, GNP, Glenveagh (C023214), 29 June 1988 (Murray, 2005). L. Veagh, north east shore, Glenveagh (C039230), 29 June 1988 (DAM). **MAYO: HA 32** - pond, Laghta (L845759), 7 May 2004, DAM/WM (DAM): **HA 33** - bog pools, Glenamoy (F896345), April 1973, CD (Dowling, 1975; Dowling and Murray, 1981): **Clare Island** - pond east of Maum road (L710863), 5 June 2002, DAM/WM (Murray and Murray, 2003). **MEATH: HA 7** - marsh, Ardsallagh, Navan (N893639), 23 June 1974 (DAM). **MAYO: HA 34** - Castlebar L., Castlebar (M1087), July 1911, PHG (Grimshaw, 1912).

***Natarsia nugax (Walker, 1856)***

**GALWAY: HA 30** - L. Corrib, Lower, Hurney (M258310), 18 April 1980, BC (DAM). **KERRY: HA 22** - L. Kilbrean, Killarney (W005935), 8 September 1969, NH (Bracken and

Murray, 1973). R. Loo, Aughnanus Bridge, Crohane (W048790), 24 July 1978, PJA (Ashe, 1982; Murray, 2005).

***Natarsia punctata* (Fabricius, 1805)**

**CAVAN: HA 36** - L. Oughter, Killashandra (H349051), 6 June 2007, EPA (DAM). **KERRY: HA 22** - R. Flesk, Garries Bridge (W082835), 24 July 1978; Flesk Bridge (W034876), 13 August 1978 (Ashe, 1982). R. Loo, Aughnanus Bridge, Crohane (W045790), 24 July and 10 August 1978 (Ashe, 1982 (NMI)). **MAYO: HA 33** - bog pools, Glenamoy (F896345), August 1973, CD (Dowling, 1975; Dowling and Murray, 1981): **Clare Island** - Creggan L., Lecarrow (L689857), 11 June 1998 (Fahy, 2002).

***Nilotanypus dubius* (Meigen, 1804)**

**ANTRIM: HA 4** - R. Brymore, Brymore Bridge (D162275), 2 July 2000 (Langton, 2002). **CARLOW: HA 12** - R. Slaney, Kilcarry Bridge (S893624), 28 July 1981 (Hayes, 1991). **CLARE: HA 28** - R. Annageeragh, Moyglass Bridge d/s L. Doo (R078725), 30 July 1982 (Hayes, 1991). R. Creegh, Mountrivers Bridge, Doonbeg (Q991659), 30 July 1982 (Hayes, 1991). R. Doonbeg, Derryard (Q979644), 30 July 1982 (Hayes, 1991). **CORK: HA 18** - R. Blackwater, Shamrock Bridge, Millstreet (W221935), 2 September 1981 and Ballymacquirk Bridge, Banteer (W382989), 1 September 1981 (Hayes, 1991): **HA 20** - R. Bandon, Long Bridge, Dunmanway (W242631), 27 May, 30 June, 25 August, September 1980; u/s Ballineen (W331537), 27 May, 30 June; 2.5km d/s Bandon (W516569), 18 April and 30 June 1980 (all Morgan, 1982). R. Ilen, Drimoleague (W098454), 24 August 1983 and Madore (W103419), 24 August 1983 (Hayes, 1991). **DONEGAL: HA 1** - R. Deelee, Legland, Raphoe (C136028), 19 July 2000 (Langton, 2002): **HA 37** - R. Eany, d/s Eanybeg confluence (G842815), 10 August 1982 (Hayes, 1991). R. Eanymore, Letterbara Bridge (G883825) and Drumagraa Bridge (G863822), 10 August 1982 (Hayes, 1991). R. Oily, Claggen (G751803), 8 August 1982 (Hayes, 1991). R. Stragar, Duninkeely (G727792), 10 August 1982 (Hayes, 1991) and Killybegs

(G730787), 29 July 1984 (Murray, 2005): **HA 38** - R. Owenwee, Derrynacarrow, Doocharry (B880078), 22 August 1984 (DAM). R. Devlin, Dunlewy (B927190), 19 July 2000 (Langton, 2002). R. Tullaghobeg, Millmount (B933304), 12 August 1982 (Hayes, 1991). R. Owenveagh, Glenbeagh Cottage, Glenveagh (B990178), 30 July 1985 (Heneghan, 1986). R. Owencarrow, d/s road bridge, Glenveagh (C043235), 18 July 2000 (Langton, 2002). R. Ray, Carrowcanon (B995325) and Crocnalaragh (B989272), 12 August 1982 (Hayes, 1991): **HA 39** - R. Glashagh, Drumbologe, Letterkenny (C096153), 18 July 2000 (Langton, 2002). R. Swilly, Newmills, Letterkenny (C125092), 18 July 2000 (Langton, 2002). R. Leannan, Kilnacrenan (C145200), 12 August 1982 (Hayes, 1991); R. Leannan, Drumaboden (C165218), 12 August 1982; Claragh (C197210), 13 August 1982 (Hayes, 1991). R. Crana, Buncrana (C347328), 15 August 1982 (Hayes, 1991); R. Crana, Ballymagan (C379344), 15 August 1982 (Hayes, 1991). **GALWAY: HA 30** - R. Loughkip, Ballyquirk, Moycullen (M224313), 17 August 1981 (Hayes, 1991): **HA 31** - L. Ahalia, Maam (L971402), 23 September 2009, EPA (DAM). R. Owentouey, Tullywee Bridge, Recess (L873474), 18 August 1981 (Hayes, 1991): **HA 32** - R. Owenglin, Clifden (L677506), 18 August 1981 (Hayes, 1991). R. Dawros, Tullywee Bridge, Letterfrack (L730586), 18 August 1981 (Hayes, 1991). **KERRY: HA 21** - R. Inny, Scarriff Bridge (V504696), 24 August 1983 (Hayes, 1991): **HA 22** - Muckross Lake, Muckross, Killarney (V950853), 24 June 2008, EPA (DAM). R. Annascaul, Annascaul (Q593017), 2 July 1981 (Hayes, 1991). R. Caragh, Upper Brida Valley (V785810), Bealalaw Bridge (V715832) and Blackstones Bridge, d/s R. Acoose confluence (V710864), 1975, CD (Dowling *et al.*, 1981). R. Clydagh, Caherbarnagh (W202842), u/s Clydagh Bridge (W114826) and Knocknagowan (W187837), May to October 1978 (Ashe, 1982). R. Flesk, d/s Clydagh/Loo confluence (W084814), Garries Bridge (W082835) and Flesk Bridge (W034876), May to October 1978 (Ashe, 1982); White Bridge (V987904), July 1973 (Douglas and Murray, 1980); d/s Whitebridge (V987900), 21 July and 17 September 1978 (Ashe, 1982 (NMI)); d/s New Bridge (V963885) and u/s L. Leane (V964894), May to October 1978 (Ashe, 1982). R. Loo, Aughnanus Bridge, Crohane (W045790), May to October 1978 (Ashe, 1982). Upper Lake,

Gortroe, Killarney (V918818), June 1973 (Douglas and Murray, 1980). **KILKENNY: HA 15** - R. Nore, Brownsbarn Bridge (S618391), 28 August 1981 (Hayes, 1991). **MAYO: HA 32** - stream at first road bridge d/s L. Nahaltora, Derrygarve, Cregganbaun (L784744), 6 June 2004, DAM/WM (DAM). R. Carrowinsky, Killeen, Carrowinsky (L770773), 5 August 2004, DAM/WM (DAM). R. Bunowen, Louisburg (L807807), 7 May and 5 August 2004 and R. Bunowen, Laghta Eighter (L852751), 30 September 2004, DAM/WM (DAM). L. Fin, Delphi (L841657), 12 July 2006, EPA (DAM). R. Owengarve, Rosgalliv Bridge, Mulranny (L886962), 4 August 2004, DAM/WM (DAM). R. Altahoney, Newport (F950050), 1968-1971, EF (Fahy and Murray, 1972). R. Owenwee, u/s Aghamore Bridge, Westport (L972817), 5 August 2004, DAM/WM (DAM). R. Erriff, Ashleigh Falls (L895645), 18 August 1981 (Hayes, 1991): **HA 33** - R. Glenlassra, Belderg (G023407), 19 August 1983 (Hayes, 1991): **Clare Island** - Loughnapucar stream (L658848), 21 August 2002, DAM/WM (Murray and Murray, 2003; Murray, 2005). **MEATH: HA 7** - R. Boyne, Stackallen Bridge (N917713), Slane Bridge (N965737) and Knowth Weir (N995720), 19 July 1989 (DAM). **ROSCOMMON: HA 26** - R. Suck, Castlecoote (M809627), 16 July 1981; Athleague (M825758), 14 August 1981; Mount Talbot (M813531), 14 August 1981, Ballyforan (M817464), 16 July 1981 (all Hayes, 1991). **SLIGO: HA 35** - R. Drumcliff, Glencar (G734430), 19 August 1983 (Hayes, 1991). **TIPPERARY: HA 16** - R. Drish, Boolabea Bridge (S190619), 22 May and 6 July 1992 (Murray and Lynch, 1992). R. Suir, Rossestown Bridge (S134624) and Cabragh (S124562), 6 July 1992 (Murray and Lynch, 1992). **WEXFORD: HA 12** - R. Slaney, Clomahon (S933534) and Ballycarney (S967488), 29 July 1981 (Hayes, 1991). **WICKLOW: HA 10** - outflow from Upper Glendalough Lake, Laragh, WMNP (T109964), 16 July 1996, EMcE/DAM (McEntee, 1997). R. Glendasan, Laragh, WMNP (T100982), 24 June 1996 (DAM). R. Avonbeg, Glenmalure, Drumgoft Bridge (T105905), 4 August 1983 (Hayes, 1991); R. Avonbeg, Meetings Bridge (T188831), 11 July and 27 October 1997 (Curran, 2001). R. Avonmore, Castlehoward (T190833), 4 August 1983 (Hayes, 1991); R. Avonmore, Lion Arch Bridge (T194833), 11 July 1997 (Curran 2001). R. Avoca, Whitebridge, Tigroney (T198821), 4 August 1983 (Hayes,

1991) and 11 July 1997 (Curran, 2001). Avoca Village (T203802), 11 July 1997, FC (Curran and Murray, 2001) and October 1997 (Curran, 2001): **HA 12** - R. Slaney, Knockgarrigan, Glen of Imaal (S936937), 28 July 1981 (Hayes, 1991).

***Paramerina cingulata* (Walker, 1856)**

**ANTRIM: Rathlin Island** - long pool, (D148521), 24 July 2000 (Langton, 2002). *Menyanthes* pool (D123515), 6 July 2004 (PHL). L. Nachiule (D160521), 24 July 2000 (Langton, 2002): **HA 3** - L. Neagh, Antrim Bay (J135866), 28 March 2001 (PHL): **HA 4** - R. Glenariff, Cushendall (D215205), 2 July 2000 (Langton, 2002). **CAVAN: HA 7** - L. Mullagh, Mullagh (N680856), 30 April 1968 (DAM). **CLARE: HA 27** - L. Cullaun, Corrofin (mid east shore) (R317905), 22 July 2009, EPA (DAM). L. Rosroe, north east shore, Newmarket on Fergus (R449697), 16 September 2009, EPA (DAM): **HA 28** - L. Keagh, north shore, Milltown Malbay (R100813), 19 September 2012 (DAM). L. Lickeen, west shore, Kilfenora (R164908), 15 September 2009, EPA (DAM). L. Naminna, north west shore, Boolteagh (R178710), 7 July 2009, EPA (DAM). L. Naminna, mid lake, Boolteagh (R179708), 11 June and 15 September 2009, EPA (DAM): **HA 29** - L. Skeardeen, Kilcorkan (R388991), 17 June 2009, EPA (DAM). **CORK: HA 20** - L. Ballin, Leap (W199389), 17 June and 17 September 2008, EPA (DAM). L. Coolklure, Dunmanway (W177539), 7 April and 16 September 2008, EPA (DAM). L. Curragallicky, Drinagh, Dunmanway (W234046), 12 August 2008, EPA (DAM). L. Tooreen, Crookhaven (V790259), 17 June and 17 September 2008, EPA (DAM). **DONEGAL: HA 1** - R. Deelee, Legland, Raphoe (C136028), 19 July 2000 (Langton, 2002). L. Derg, Pettigo (H074743), 8 June 2009, EPA (DAM): **HA 36** - L. Tullynasiddagh, Ballyshannon (G983656), 8 June 2009, EPA (DAM). L. Unshin, Ballyshannon (G951637), 8 June and 8 September 2009, EPA (DAM): **HA 37** - Carn L., Blue Stack Mountains (G871886), 27 July 2005, JRB (DAM). R. Stragar, Killybegs (G730787), 29 July and 23 August 1984 (DAM): **HA 38** - L. Altercan, The Rosses (B755158), 19 July 2000 (Langton, 2002). L. Dunglow, west shore, Dunglow (B782119), 5 August 2009, EPA (DAM). L. Anure, east shore, Loughanure (B818162), 17 June and 12

August 2009, EPA (DAM). L. Nasnahida, Doocharry, Dunglow (B852076), 10 September 2009, EPA (DAM). R. Devlin, Dunlewy (B927190), 19 July 2000 (Langton, 2002). L. Veagh, GNP, boathouse near Castle (C022211), 23 August 1985, LJH (Heneghan, 1986), 21 July 2009, EPA (DAM); shore near Visitor Centre, Glenveagh (C033223), 19 July 2000 (Langton, 2002); north east shore (C039230), 24 July 1985, POD, and 26 July 1985, LJH (Heneghan, 1986) also 29 June 1988 (DAM). Owennacally stream (C043226), 19 July 2000 (Langton, 2002). R. Ray, Muckish Gap (B993268), 12 August 1982 (Hayes, 1991). L. an tSeisigh, Portnablagh (Sheephaven) (C043361), 16 June, 28 July and 7 September 2009, EPA (DAM). L. Glen, Glen (C105292), 16 June and 29 July 2009, EPA (DAM). L. Greenan, Loughsalt, Kilmacrennan (C117262), 16 June 2009, EPA (DAM). L. Shannagh, Magheradrumman, Fanad Peninsula (C216450), 9 September 2009, EPA (DAM). L. Kiltoris, Dawros, Ardara (G675976), 17 June 2009, EPA (DAM): **HA 39** - R. Glashagh, Drumbologe, Letterkenny (C096153), 18 July 2000 (Langton, 2002): **HA 40** - L. Naminn, Cloonmany (C400423), 18 August 2011 (PHL). **DOWN:** **HA 3** - R. Shanky, Batts Bridge, Hilltown (J226257), 25 May 1998 (PHL). **DUBLIN:** **HA 9** - Royal Canal, Ashtown (O108378), May 1968 (Murray, 1972). Bog pool, Featherbed Mountain (O120190), 27 August 1981 (Murray, 2005). **FERMANAGH:** **HA 35** - Glen R., Garrison (G943522), 29 June 2000 (Langton, 2002): **HA 36** - L. Atona, Cuilcagh Mountain (H110294), 29 June 2000 (Langton, 2002). **GALWAY:** **HA 30** - L. Beaghcauneen, Ballinaboy (L679470), 6 June and 18 July 2007, EPA (DAM). L. Bofin, Maam Cross (M034441), 7 June 2007, EPA (DAM). L. Corrib, Knockferry (M236415), 8 May 1980, BC (DAM). L. Lettercraffroe, Oughterard (M056376), 14 June 2007, EPA (DAM): **HA 31** - L. Ahalia, north east shore, Maam (L971402), 23 September 2009, EPA (DAM). L. Anaserd, Ballyconneely (L605443), 16 May, 20 June, 11 September 2006, also 6 June, 17 July and 11 September 2007, EPA (DAM). L. Aunwillan, Carraroe (L936255), 7 June and 13 September 2007, EPA (DAM). L. Ballynahinch, Ballynahinch (L777478), 6 June and 13 September 2007, EPA (DAM). L. Ballynakill, Gorumna (L867236), 19 September 2006, EPA (DAM). L. Derryclare, Recess (L825485), 16 July 2007, EPA (DAM). L. Illauntrasna, Glentrasna, Garomna (L888254), 16

April, 25 July and 12 September 2007, EPA (DAM). L. Loughanaure, Kilkieran (L828320), 12 September 2007, EPA (DAM). L. Nahasleam, Maam Cross (L972440), 16 May, 8 August and 12 September 2006, also 7 June and 13 September 2007, EPA (DAM): **HA 32** - L. Aughrusbeg, Cleggan (L557582), 10 July 2007, EPA (DAM). L. Ballynakill, Cleggan (L639581), 5 June and 11 September 2007, EPA (DAM). L. Enask, Beaghcauneen (L662468), 17 September 2007, EPA (DAM). L. Fadda, Beaghcauneen (L668455), 17 July and 11 September 2007, EPA (DAM). L. Pollacappul, Kylemore (L754582), 5 June 2007, EPA (DAM). **KERRY: HA 21** - L. Brin, Derreeny (V780775), 18 June, 13 July and 10 September 2008, EPA (DAM). Eagles L., Knocknagantee (V674728), 9 August 2005, JRB (DAM): **HA 22** - L. Cummernamuck, Killorglin (V745897), 20 June and 18 July 2008, EPA (DAM). L. Leane, Killarney, Bog Bay (V963866), 1973 (Douglas and Murray, 1980). Upper Lake, Killarney (V909821), 31 July 1973 (DAM), 9 September 2008, EPA (DAM). R. Caragh, d/s Owenroe R. confluence (V720815) and Bealalaw Bridge (V715832), 1975, CD (Dowling *et al.*, 1981): **HA 23** - L. Cam, Castlegregory (Q597079), 18 September 2008, EPA (DAM). **LEITRIM: HA 35** - L. Sandy, Crocknagapple (G891448), 4 August 2005, JRB/MC (DAM). **MAYO: HA 30** - L. Aille, Aille, Westport (M071807), 24 June, 8 August and 18 September 2008, EPA (DAM): **HA 32** - L. Doo, Delphi, north east shore (L834689), 16 June 2002, DAM/WM (Murray, 2005). L. Glencullin, Delphi, south west shore (L819696), 25 August 2008, EPA (DAM) and north shore (L818711), 22 September 2008, EPA (DAM). L. Nahaltora, Cregganbaun (L794745), 30 September 2004, DAM/WM (DAM). R. Bunowen, Louisburg (L807807), 5 August 2004, DAM/WM (DAM). R. Altahoney, Newport (F950050), 1968-1971, EF (Fahy and Murray, 1972). L. Moher, Liscarney, Westport (L977766), 21 July 2008, EPA (DAM). Westport, Knappagh (L9880), July 1911, PHG (Grimshaw, 1912): **HA 33** - L. Acorrymore, Achill Island (F578057), 29 September 2004, DAM/WM (DAM) also 17 June, 16 July and 17 September 2008, EPA (DAM). Pool/stream, Campport Bay, Achill Island (L677982), 29 September 2004, DAM/WM (DAM). Bog pools, Glenamoy (F896345), 7 May 1970, E. Okley (DAM) and April 1973, CD (Dowling, 1975; Dowling and Murray, 1981): **HA 34** - L. Alone, Ox Mountains

(G367157), 5 August 2005, JRB/MC (DAM). L. Washpool, Ballycarra (M219842), 25 September 2008, EPA (DAM): **Clare Island** - L. Leinapollbauty, Lecarrow (L691856), 5 June 2002 and pond east of Maum road (L710863), 20 August 2002 (Murray and Murray, 2003). Creggan L., Lecarrow (L689857), June to October 1998 and 1999 (Fahy, 2002) also 21 August 2002 (Murray and Murray, 2003). L. Poirin Fuinch (L706857), 14 September and 5 October 1998, also 2 June, 7 July, 13 July and 20 August 1999 (Fahy, 2002). **MEATH: HA 7** - R. Boyne, Ardsallagh, adjacent to St Bridget's Well (N897635), 7 July 1988 (Murray, 1988); Stackallen Bridge (N917713), Slane Bridge (N965737), Knowth Weir (N995720) and Oldbridge (O045761), 19 July 1989 (DAM). **ROSCOMMON: HA 26** - L. Glinn, Loughglinn, Castlerea (M629870), 12 June 2008, EPA (DAM). **TIPPERARY: HA 16** - R. Drish, Athlummon Bridge (S177593), 22 May 1992 (Murray and Lynch, 1992): **HA 18** - Black L., Ox Mountains (R738771), 4 May and 10 August 2005, JRB (DAM). L. Curra, Galtymore Mountain (R867242), 10 August 2005, JRB (DAM). **WATERFORD: HA 16** - Ballyscanlan Reservoir, Tramore (S540030), 19 August and 1 September 2009, EPA (DAM): **HA 17** - Belle Lake, Dunmore East (S665049), 2 July 2009, EPA (DAM). **WICKLOW: HA 10** - L. Bray Lower, Glencree (O140163), 16 June 2009, EPA (DAM). L. Dan, Roundwood (O157035), 2 September 2009, EPA (DAM). Glencullen R., Knocksink (O218180), 29 June 1987, DEM/DAM (Morgan, 1989). R. Glenealo, Glendalough (T090962), 16 July 1996, EMcE/DAM (McEntee, 1997). Outflow from Upper Glendalough Lake, Laragh, WMNP (T109964), 16 July 1996, EMcE/DAM (McEntee, 1997). R. Glendasan, Laragh, WMNP (T100982), 24 June 1996 (DAM).

***Paramerina divisa* (Walker, 1856)**

**ANTRIM: HA 3** - L. Neagh, Antrim Bay (J135866), 23 March 2001 (PHL). **CORK: HA 18** - R. Blackwater, Charles Bridge, Millstreet (W248943), 2 September 1981, Ballymacquirk Bridge, Banteer (W382989) and Roskeen Bridge, Banteer (W444988), 1 September 1981 (Hayes, 1991): **HA 20** - R. Bandon, Long Bridge, Dunmanway (W242631), 27 May, 30 June



1982; Bealabouty Bridge, Dunmanway (W257514), 27 May, 30 June, 25 August 1980; u/s Ballineen (W331537), 27 May, 30 June, 25 September 1980; Ballineen Bridge (W434538), 30 June 1980; Castle Bernard (u/s Bandon) (W472546), 30 June 1980; 2.5km d/s Bandon (W516569), 30 June 1980 (all Morgan, 1982). R. Ilen, Madore (W103419) and Hollybrook (W117363), 24 August 1983 (Hayes, 1991). **DONEGAL: HA 37** - L. Eske, Donegal (G973844), 14 July 2009, EPA (DAM). R. Eany, d/s Eanybeg confluence (G842815), 10 August 1982 (Hayes, 1991). R. Eanymore, Drumagraa Bridge (G863822), 10 August 1982 (Hayes, 1991). R. Oily, Claggen (G751803), 8 August 1982 (Hayes, 1991). R. Stragar, Duninkeely (G727792), 10 August 1982 (Hayes, 1991): **HA 39** - L. Gartan, Church Hill (C055159), 22 July 2009, EPA (DAM). R. Leannan, Kilnacrenan (C145200) and Drumaboden (C165218), 12 August 1982; Claragh (C197210), 13 August 1982 (Hayes, 1991). R. Crana, Buncrana (C347328), 15 August 1982 (Hayes, 1991): **HA 40** - R. Keenagh, Hugh Roe's Bridge, Umgall (C454543), 16 August 1982 (Hayes, 1991). **DUBLIN: HA 9** - R. Dodder, Fort Bridge, Bohernabreena (O009242), 16 July 1968 (Murray, 1972). **GALWAY: HA 26** - R. Shiven, d/s Ballinaglass (M788494), 29 July 1981 (Hayes, 1991): **HA 30** - L. Ross, Moycullen (M200363), 25 May 2003 (PHL). Stream at picnic site on road N59, Moycullen (M204326), 25 May 2003 (PHL). R. Cregg, Addergssole Bridge (M324350), 16 August 1981 (Hayes, 1991): **HA 31** - L. Ardderry, Maam Cross (L982458), 1 August 2007, EPA (DAM): **HA 32** - L. Nambrackmore, Ballinaboy, Toombeola (L716454), 6 June 2007, EPA (DAM). **KERRY: HA 22** - R. Caragh, Bealalaw Bridge (V715832) and at L. Caragh outflow (V713924), 1975, CD (Dowling *et al.*, 1981). R. Flesk, d/s Clydagh/Loo confluence (W084814), May to October 1978 (Ashe, 1982); Garries Bridge (W082835), May to October 1978 (Ashe, 1982); Flesk Bridge (W034876), May to October 1978 (Ashe, 1982); d/s Whitebridge (V987900), May to October 1978 (Ashe, 1982), 18 August 1983, LJH (DAM); u/s Newbridge (V978900), 12 July 1974 (Murray, 2005); d/s New Bridge (V963885), May to October 1978 and 1979 (all Ashe, 1982); u/s L. Leane (V964894), May to October 1978 (Ashe, 1982). R. Loo, Aughnanus Bridge, Crohane (W045790), May to October 1978 (Ashe, 1982). **LEITRIM: HA 35** - L. Glencar, Glencar

(G757435), 21 July and 2 September 2008, EPA (DAM). **MAYO: HA 32** - R. Owenwee, u/s Aghamore Bridge, Westport (L972817), 8 May 2003, DAM/WM (Murray, 2005): **HA 33** - R. Owenmore, Bangor Erris (F863228), 18 August 1983 (Hayes, 1991). R. Glenlassra, Belderg (G023407), 19 August 1983 (Hayes, 1991). **MEATH: HA 7** - R. Boyne, Bellinter Bridge (N894625), 18 August 1968 (Murray, 1972) and Ardsallagh, adjacent to St Bridget's Well (N897635), 7 July 1988 (Murray, 1988). **OFFALY: HA 25** - R. Little Brosna, Milltown Park (S068907), 2 September 1982 (Hayes, 1991). **ROSCOMMON: HA 26** - R. Suck, Castlecoote (M809627), 16 July 1981 (Hayes, 1991); R. Suck, Ballyforan (M817464), 16 July 1981 (Hayes, 1991). L. Funshinagh, Brideswell (M933513), 13 June 2007, EPA (DAM). **TIPPERARY: HA 16** - R. Drish, Castletown (S217635), 6 July 1992 (Murray and Lynch, 1992).

***Paramerina* sp., pe1 sensu Langton and Visser (2003)**

**DONEGAL: HA 37** - R. Stragar, Killybegs (G730787), 23 August 1984 (DAM). **DUBLIN: HA 9** - R. Dodder tributary (Slade Brook), Glenasmole (O103205), 8 June 1978, PA (DAM). **KERRY: HA 22** - R. Flesk, u/s Newbridge (V978900), 12 July 1974 (DAM). **MAYO: HA 32** - R. Altahoney, Newport (F950050), August 1974 (DAM). **WICKLOW: HA 10** - R. Glendasan, Laragh, WMNP (T100982), 24 June 1996 (DAM). R. Avonbeg, Glenmalure, Drumgoft Bridge (T105905), 4 August 1983 (Hayes, 1991).

***Procladius (Holotanypus) choreus* (Meigen, 1804)**

**ANTRIM: Rathlin Island** - long pool (D148521), 24 July 2000 (Langton, 2002); *Menyanthes* pool (D123515), 6 July 2004 (PHL); east lighthouse pool (D156516), 24 July 2000 (Langton, 2002): **HA 3** - L. Neagh, Lennymore Bay - east (J120735), 1970 and Lennymore Bay - north (J115745), 1966 (Marks and Henderson, 1970). Reservoir, Killylane, Magherabane, Larne (J292985), 8 May 1999 (PHL): **HA 5** - L. Mourne, Carrickfergus (J415924), 7 April 2012, (PHL). **CAVAN: HA 7** - L. Nadreegeal, Ballyjamesduff (N537933), 2 May 2007, EPA (DAM). L. Acurry, Baileborough (N584990), 5 July 2007, EPA (DAM). Park R., Virginia (N591882),

14 March 1968 (Murray, 1972). L. Ramor, Virginia (N595870), 7 June 1967 (Murray, 1972): **HA 36** - Glasshouse L., Killashandra (H270060), 18 July 2007, EPA (DAM). L. Annagh, Butler's Bridge (H394125), 3 July 2007, EPA (DAM). L. Cuillaghan, Ballyconnell (H303183), 13 April and 6 June 2007, EPA (DAM). L. Garty, Arvagh (N278978), 18 July 2007, EPA (DAM). L. Gowna, north basin, Arnagahan (N285920), 7 June 2006 and 24 July 2007, EPA (DAM). **CLARE: HA 25** - L. Graney, Doorus (R557924), 11 August 2009, EPA (DAM). L. Derg, Mountshannon (R718861), 18 September 2009 also d/s Killaloe (M705715), 21 April and 18 September 2009, EPA (DAM); L. Graney, east shore, Flagmount (R563932), 16 September 2009, EPA (DAM). L. Alewnaghta, west shore, Whitegate (R758908), 17 June and 16 July 2009, EPA (DAM): **HA 27** - L. Bridget, east shore, Derrymore, Badyke (R558797), 21 April and 29 July 2009, EPA (DAM). L. Cullaun, Corrofin (mid east shore) (R317905), 22 July 2009, EPA (DAM). L. Dromore, Ruan, Corrofin (R345858), 8 June 2006, EPA (DAM) and 21 July 2009, EPA (DAM). L. Gortglass, south shore, Killadysert (R223596), 2 April 2009, EPA (DAM). L. Inchiquin, south east shore, Corrofin (R272894), 16 June and 17 September 2009, EPA (DAM). L. Muckanagh, south east shore, Tubber, Corrofin (R370922), 11 June and 14 September 2009, EPA (DAM): **HA 28** - L. Keagh, Milltown Malbay, north shore (R100813), 15 September 2009, EPA (DAM) and 19 September 2012 (DAM): **HA 29** - L. Skeardeen, Kilcorkan (R388991), 7 April and 17 June 2009, EPA (DAM). **CORK: HA 19** - Carrigdroihid Reservoir, Ashton (W360703), 3 April 2008 and 16 September 2008, EPA (DAM). L. Aderry, Castlemartyr (W935730), 27 August 1969, NH (Bracken and Murray, 1973). L. Allua, Ballingearry (W180652), 4 April, 17 June and 20 August 2008, EPA (DAM). L. Gouganebarra, Inchegeelagh (W009060), 7 April 1966, DAM (Murray, 1972): **HA 20** - L. Abisdealy, Skibbereen (W136314), 9 April, 30 July and, 17 September 2008, EPA (DAM). L. Ballin, Leap (W199389), 9 April and 17 June 2008, EPA (DAM). L. Coolklure, Dunmanway (W177539), 17 June and 11 August 2008, EPA (DAM). L. Curraghally, Drinagh, Dunmanway (W234046), 9 April, 17 June and 12 August 2008, EPA (DAM). L. Skeagh (Schull Reservoir), Schull (V937338), 17 September 2008, EPA (DAM). L. Tooreen, Crookhaven (V790259), 10

April and 17 September 2008, EPA (DAM): **HA 21** - L. Avaul, Glengarriff (V910553), 19 May 1969, NH (Bracken and Murray, 1973). L. Reenydonegan, Bantry (W000515), 19 May 1969, NH (Bracken and Murray, 1973). **DERRY: HA 1** - Upper Reservoir, Creggan (C417173), 10 May and 18 May 2001, 17 May 2002 (PHL); Lower Reservoir, Creggan (C422174), 10 May 2001 (PHL): **HA 2** - pool, Roe Valley Park, Limavady (C679201), 14 July 2000 (Langton, 2002). Pond, Binevenagh, Coleraine (C691305), 25 August 2001 (PHL); fire dam, Binevenagh Forest, Coleraine (C699304), 18 May 2000 (Langton, 2002): **HA 3** - Howell's Tarn, Ballywildrick, Coleraine (C766325), 7 April and 7 July 2002 (PHL). Pond, Downhill Forest, Lions Gate, Coleraine (C762357), 22 June 2000 (Langton, 2002). Lake, Downhill Forest Park (C757354), 25 July and 28 July 1999, 21 August 2001 (PHL). Reservoir, Balinrees, Coleraine (C794300), 9 June 2000 (Langton, 2002). R. Agivey, Garvagh (C838154), 30 May 2002 (PHL). Glenullin Bog, Garvagh (C795132), 29 June 2008 (PHL). R. Bann, Coleraine (C854304), 30 June 2001 (PHL). L. Neagh (H9080), no collection data (McLarnon and Carter, 2000). **DONEGAL: HA 36** - L. Golagh, Ballyshannon (G965655), 8 September 2009, EPA (DAM): **HA 37** - Carn L., Blue Stack Mountains (G871886), 27 July 2005, JRB (DAM). L. Eske, Donegal (G973844), 17 April 2009, EPA (DAM). R. Eany, d/s Eanybeg confluence (G842815), 10 August 1982 (Hayes, 1991). R. Stragar, Killybegs (G730787), 23 August 1984, DAM (LJH). L. Shinvagh, Carricode (H005675), 27 April 2002 (PHL): **HA 38** - L. Keel, Crolly (B848162), 17 June 2009, EPA (DAM). L. Nabuckan, Grogan More (B850184), 10 May 2005, JRB (DAM). L. Dunlewey, Dunlewy (B926193), 19 July 2000 (Langton, 2002). Misty L., Glenveagh, GNP (C014228), 3 June 1986, LJH (Heneghan, 1986). L. Veagh, north east shore, Derrylahan (C038233), 24 July 1985, LJH (Heneghan, 1986). L. Nadourcan, Glenveagh (C054228), 18 July 2000 (Langton, 2002). L. Fallaneas, Kindrum (C173424), 30 April, 16 June 2009, EPA (DAM). L. Shannagh, Magheradrumman, Fanad Peninsula (C216450), 16 June, 21 July 2009, EPA (DAM). L. Voriskey, The Rosses (B762176), 19 July 2000 (Langton, 2002): **HA 39** - L. Gartan, Church Hill (C055159), 10 June 2009, EPA (DAM); L. Gartan, north shore (C065173), 18 July 2000 (Langton, 2002). R. Leannan, Drumaboden (C165218), 12 August

1982 (Hayes, 1991). L. Fern, Millford (C180233), 23 July 2009, EPA (DAM). R. Crana, Buncrana (C347328), 15 August 1982 (Hayes, 1991). L. Swilly, stagnant drain, Newtown Cunningham (C311197), 21 June 2000 (Langton, 2002); L. Swilly, Inch Island impoundment, Inch (C346240), 18 August 2011 (PHL): **HA 40** - bog pool, Rowantree Hill, Merville (C551401), 18 August 2011 (PHL). **DUBLIN: HA 9** - Upper Reservoir, Bohernabreena (O095219), 29 April 1947, CFH (DAM) and 9 May 1947 (Fitzgerald, 1947). **FERMANAGH: HA 36** - L. Erne (Lower), Black Bay (H072639), 27 April 2002 (PHL). L. Kilturk, south shore, Newtownbutler (H374255), 27 June 2000 (Langton, 2002). Summerhill L., Magheraveely (H490280), 28 June 2000 (Langton, 2002). Stream, Lisnaskea (H384306), 27 June 2000 (Langton, 2002). L. Eyes, Lisbellaw (H324434), 16 August 2011 (PHL). **GALWAY: HA 29** - L. Caherglassaun, Gort (M412061), 13 June, 7 August and 18 September 2007, EPA (DAM). L. Coole, Gort (M432043), 15 June 2009, EPA (DAM). L. Cutra, Gort (R485986), 24 May 2003 (PHL): **HA 30** - L. Ballyquirke, Moycullen (M232317), 8 August 2007, EPA (DAM). L. Bofin, Maam Cross (M034441), 18 April and 7 June 2007, EPA (DAM). L. Corrib (M1545), no site or collection data, 1980, BC (DAM): **HA 31** - L. Ahalia, north east shore, Maam Cross (L971402), 22 April, 18 June and 23 September 2009, EPA (DAM). L. Anaserd, Ballyconneely (L605443), 4 April, 6 June and 17 July 2007, EPA (DAM). L. Ballynahinch, Ballynahinch (L777478), 17 April and 23 July 2007, EPA (DAM). L. Ballynakill, Gorumna (L867236), 15 May and 10 July 2006, EPA (DAM). L. Derryclare, Recess (L825485), 17 April and 16 July 2007, EPA (DAM). L. Illauntrasna, Glentrasna, Gorumna (L888254), 25 July 2007, EPA (DAM). L. Loughanaure, Kilkieran (L828320), 16 April, 24 July and 12 September 2007, EPA (DAM). L. Nahasleam, Maam Cross (L972440), 16 May 2006, 19 April 2007 and 7 June 2007, EPA (DAM): **HA 32** - pond, Diamond Hill, Letterfrack, CNP (L727568), 18 September 1986 (Heneghan, 1987). L. Ballynakill, Cleggan (L639581), 11 July 2007, EPA (DAM). L. Pollacappul, Kylemore (L754582), 2 April 2007, EPA (DAM). L. Kylemore, Letterfrack (L771582), 2 April and 30 July 2007, EPA (DAM). **KERRY: HA 21** - L. Cloonaghlin, Waterville (V611708), 19 June 2008, EPA (DAM). L. Currane, Waterville (V535664), 18 June 2008, EPA (DAM). Eagles L.,

Knocknagantee (V674728), 9 August 2005, JRB (DAM). L. Namona, Waterville (V596711), 19 June 2008, EPA (DAM): **HA 22** - L. Acoose, Slievanore, Killorglan (V755854), 9 July 2008, EPA (DAM). L. Caragh, Killorglin (V719904), 15 July 2008, EPA (DAM). L. Leane, Killarney (V931886), 22 April 2008, EPA (DAM); L. Leane, Ross Bay (V945850), June 1973 (Douglas and Murray, 1980): **HA 23** - L. Gill, Castlegregory (Q603139), 28 August 2008, EPA (DAM). **KILDARE: HA 9** - ditch, Lyons Estate, Celbridge (N970287), 29 March and 3 April 1982, PA (DAM). Rye Vale pond, Leixlip (N997366), 3 March 1968 (DAM). **KILKENNY: HA 15** - R. Clogh, Clogh (S565790), 10 March 1976, CD (DAM). **LEITRIM: HA 26** - L. Acres, Drumshanbo (G968099), 11 June 2008, EPA (DAM). L. Boderg, Derrycarne, north west shore (N013915), 29 July 2008, EPA (DAM). L. Bofin, Rinnafarna, Dromod (N036891), 29 July 2008, EPA (DAM); L. Bofin, Dromod (N049894), 24 June 2008, EPA (DAM). L. Rinn, Mohill (N095943), 10 April 2008, EPA (DAM): **HA 35** - L. Glenade, south east shore, Glenade, Manorhamilton (G831457), 22 July 2008, EPA (DAM): **HA 35** - L. Sandy, Crocknagapple (G891448), 28 April 2005, JRB/MC (DAM). **LIMERICK: HA 24** - Bleach L., Pallaskenry (R441569), 13 June and 28 July 2009, EPA (DAM). **LONGFORD: HA 26** - L. Forbes, Cloonard, Newtownforbes (N084821), 25 June 2008, EPA (DAM). **LOUTH: HA 6** - L. Mentrim, Ardee (N913879), 27 June 2005, DAM/WM (DAM). **MAYO: HA 30** - L. Aille, Aille, Westport (M071807), 8 August and 18 September 2008, EPA (DAM). L. Carra, Keel Bridge, Ballinrobe (M165680), 14 March 1974 (DAM) and 28 April 2008, EPA (DAM). L. Mask, Cushlough pier, Ballinrobe (M153650), 22 April 1964 (Murray, 1972); L. Mask, west shore, Toormakeady (M113702), 24 June 2008, EPA (DAM): **HA 32** - R. Burleemslough, Clapper Bridge Ford, Killeen (L754759), 5 August 2004, DAM/WM (DAM). L. Roonagh, Roonagh (L749759), 30 September 2004, DAM/WM (DAM). R. Bunowen, Louisburg, u/s of bridge (L807807), 5 August 2004, DAM/WM (DAM). L. Fin, Delphi (L841657), 5 April 2006, EPA (DAM). L. Feeagh, Newport (L975983), 25 June 2008, EPA (DAM). L. Carrokeel, Murrisk (L924830), 5 August 2004, DAM/WM (DAM). L. Moher, Liscarney, Westport (L977766), 21 April and 24 June 2008, EPA (DAM). Westport L., Westport Woods, Westport

(L985843), 7 May 2004, DAM/WM (DAM). L. Ballin, south shore, Westport (L994878), 22 April 2008, EPA (DAM). L. Knappabeg, Westport (M010803), 18 September 2008, EPA (DAM): **HA 33** – Achill Island: L. Acorrymore (F578057), 5 August 2004, DAM/WM (DAM) and 7 April 2008, EPA (DAM); L. Bunacurry, (F695048) and Pool/stream, Campport, Achill Island (L677982), 29 September 2004, DAM/WM (DAM). Stream at Pollranny Sweeney, Achill mainland (L755997), 6 May 2004, DAM/WM (DAM): **HA 34** - Castlebar L., north shore, Castlebar (M106879), 7 May 2004, DAM/WM (DAM). L. Conn, Cloghans (G205133), 18 April 1966 (Murray, 1972). L. Lannagh, Castlebar (M105880), 30 June and west shore (M109883), 21 August 2008, EPA (DAM). L. Levally, Massbrook (G146043), 22 April 2008, EPA (DAM). L. More, Ballynagoraher (G115044), 29 June 2006, EPA (DAM). L. Washpool, Ballycarra (M219842), 19 June, 15 August and 25 September 2008, EPA (DAM): **Clare Island** - Wetland at Ballytouhy (L696882) roadside between Maum and Capnagower (L712857) and pond east of Maum road (L710863), 20 August 2002; stream by Maum road (L711861), 5 June 2002);, (all Murray and Murray, 2003). Creggan L., Lecarrow (L689857), June to September 1998, June to November 1999 (Fahy, 2002) and 21 August 2002 (Murray and Murray, 2003). L. Poirtin Fuinch (L706857), 12 June, 4 August 1998 also 13 August and 7 September 1999 (Fahy, 2002). Pond, east of signal tower (L658859) and Pond at Bunnamohaun (L659846), 21 August 2002 (Murray and Murray, 2003). **MEATH: HA 7** - artificial tank, Ardsallagh, Navan (N896635), 3 June 2000 (DAM). R. Boyne, Slane Bridge (N965737) and Oldbridge (O045761), 19 July 1989 (DAM). Tailings pond, Randalstown, Navan (N845714), 19 July 1994 (DAM) and 12 September 1994 (Finnegan, 1998). **MONAGHAN: HA 36** - L. Annaghmakerrig, Newbliss (H585205), 25 April, 22 May and 27 June 2006, EPA (DAM). L. Drumlona, Rockcorry (H636176), 11 July 2007, EPA (DAM). L. Summerhill, Clones (H490279), 26 April 2007, EPA (DAM). **OFFALY: HA 25** - bog lake, Turraun (N172185), June 1998 (DAM). **ROSCOMMON: HA 26** - R. Suck, Newtown (M844346), 15 August 1981 (Hayes, 1991). L. Meelagh, Keadew (G901117), 15 April, 11 June 2008, EPA (DAM). L. Annaghmore, Strokestown, Elphin (M902838), 15 July 2008, EPA (DAM). L. Cavetown, Boyle (M832974),

11 June and 17 July 2008, EPA (DAM). L. Funshinagh, north of Brideswell (M933513), 23 April 2007, EPA (DAM). L. Glinn, Loughglinn, Castlerea (M629870), 12 June 2008, EPA (DAM). L. Grange (Grange L.), Greywood, Strokestown (M938857), 8 April 2008, EPA (DAM). L. O'Flynn, south east shore, Ballinlough (M585786), 12 June 2008, EPA (DAM). **SLIGO:** - L. Gara, Cuppanagh, Cloonlough (G714013), 26 June 2008, EPA (DAM); L. Gara, Monastredan (M708996), 28 April 2008, EPA (DAM): **HA 35** - L. Kilsallagh (Reservoir), Kilsallagh (G734393), 23 July 2008, EPA (DAM). L. Templehouse, Ballymote (G619182), 30 April, 11 June, 4 September and 9 September 2008, EPA (DAM). L. Gill (G782350), 20 August 2008, EPA (DAM). **TIPPERARY:** **HA 16** - R. Suir, Cabragh (S124562), 6 July 1992 (Murray and Lynch, 1992): **HA 18** - Black L., Arra Mountains (R738771), 10 August 2005, JRB (DAM). L. Curra, Galtymore Mountain (R867242), 10 August 2005, JRB (DAM): **HA 25** - R. Kilmastulla, Kilmastulla Bridge (R728698), 3 September 1981 (Hayes, 1991). **TYRONE:** **HA 1** - L. Oak, Gortin, Newtown Stewart (H498843), 16 August 2011 (PHL). L. Macrory (H575765), 16 August 2011 (PHL). **WATERFORD:** **HA 16** - Ballyscanlan Reservoir, Tramore (S540030), 3 July 2009, EPA (DAM): **HA 17** - Belle Lake, Dunmore East (S665049), 22 April and 2 July 2009, EPA (DAM). L. Carrigavantry, Tramore (S548022), 21 April and 3 July 2009, EPA (DAM). **WESTMEATH:** **HA 25** - L. Ennell, Tudenham (N415466), 3 March 1966 (Murray, 1972), 1981 (Forde, 1985). **HA 26** - L. Owel, Mullingar (N421566), 24 July 1980, NH (BPH). L. Owel, Mullingar (N421566), 1981, GPF (Forde, 1985). L. Killinure, Ballaghkeernan Bay (N069445), 24 April 2007, EPA (DAM). **WICKLOW:** **HA 10** - L. Bray Lower, Glencree (O140164), 4 June 1986 and 16 June 2009, EPA (DAM). L. Dan, Roundwood (O157035), 15 June 2009, EPA (DAM). L. Tay, Luggala (O163008), 28 July 2009, EPA (DAM). R. Glenealo, Glendalough (T090962), 16 July 1996, EMcE/DAM (McEntee, 1997). Upper Glendalough Lake, east shore (T110963), 10 July 1996 (Murray, 2005).

***Procladius (Holotanypus) crassinervis* (Zetterstedt, 1838)**

**ANTRIM:** **HA 5** - L. Mourne, Carrickfergus (J415924), 4 May 1999 and 7 April 2012 (PHL).



**CAVAN: HA 7** - L. Acurry, Baileborough (N584990), 5 April 2007, EPA (DAM). L. Ramor, Virginia (N595870), 6 March 1989 (DAM): **HA 26** - L. Sheelin, Kilnahard (N435860), April 1988 (DAM) and Gore Point (N439817), March 1983, PG (DAM): **HA 36** - L. Derrybrick, Milltown, Belturbet (H346117), 4 April 2007, EPA (DAM). L. Gowna, south basin, Dring (N300856), 18 April 2007, EPA (DAM). L. Sillan, Shercock (H708071), 14 March 1978 (DAM) and mid lake (H705067), 19 April 2007, EPA (DAM). **CLARE: HA 27** - L. Bunny, south east shore, Aughrim (R377965), 11 June 2009, EPA (DAM). L. Cullaun, Corrofin (mid east shore) (R317905), 5 April, 7 June 2006 and 8 April 2009, EPA (DAM). L. Dromore, Ruan, Corrofin (R345858), 11 April 2006 and 8 April 2009, EPA (DAM). L. Inchicronan, west basin, Crusheen (R391860), 8 April 2009, EPA (DAM): **HA 28** - L. Lickeen, west shore, Kilfenora (R168909), 6 April 2009, EPA (DAM). L. Naminna, Boolteagh (R179708), 11 June 2009, EPA (DAM). **CORK: HA 19** - L. Allua, Ballingeary (W180652), 4 April 2008, EPA (DAM). **DERRY: HA 1** - Upper Reservoir, Creggan, Derry (C417173), 26 April 2001, 17 May 2002 (PHL); Lower Reservoir, Creggan, Derry (C422174), 23 March 2001 (PHL): **HA 3** - L. Neagh (H9080), no collection data, May to August, 1971-1974 (Carter, 1975; McLarnon and Carter, 2000). **DONEGAL: HA 37** - L. Eske, Donegal (G973844), 17 April 2009, EPA (DAM). L. Shinvagh, Carricode (H005675), 27 March 2004 (PHL): **HA 38** - L. Veagh, north east shore, Glenveagh (C039230), 22 August 1984 (DAM). R. Owencarrow, vegetation sweep near bridge, Glenveagh (C041229), 22 August 1985 (Heneghan, 1986). L. Nadourcan, Glenveagh (C054228), 23 July 1985 (Heneghan, 1986). L. an tSeisigh, Portnablagh (Sheephaven) (C043361), 1 April 2009, EPA (DAM). L. Keel, Kilmacrennan (C158243), 2 April 2009, EPA (DAM). **GALWAY: HA 30** - L. Beaghcauneen, Ballinaboy (L679470), 5 April 2007, EPA (DAM). L. Corrib Upper, Oughterard (M138486), 11 April 2007, EPA (DAM): **HA 32** - L. Augrusbeg, Cleggan (L557582), 4 April 2007, EPA (DAM). **KERRY: HA 22** - Doolough, Muckross Peninsula (V949860), 3 July 1973 (Douglas and Murray, 1980). L. Guitane, Crohane, Killarney (W025846), 21 April 2008, EPA (DAM). L. Kilbrean, Killarney (W005935), 26 August 1969, NH (Bracken and Murray, 1973). L. Leane, Killarney, Brickeen

(V937850), 4 April 1974 (Murray, 2005); Castlough Bay, north (V975873), 27 June 1973, JPOC (Douglas and Murray, 1980); Castlough Bay, south (V966866), 3 April 1974 (Douglas and Murray, 1980); Glena Bay (V930858), 27 July 1973 (Douglas and Murray, 1980); O'Sullivan's Cascade (V916886), 17 April 1973 (Douglas and Murray, 1980); Muckross Boathouse (V965866), 6 September 1997, NOM (DAM). Muckross Lake, Killarney, Dundag Bay (V964858), 1973 (Douglas and Murray, 1980). **LEITRIM: HA 26** - L. Allen, Mountallen, Drumshanbo (G950145), 28 April 2008, EPA (DAM). L. Bofin, Dromod (N049894), 10 April 2008, EPA (DAM): **HA 35** - L. Glenade, south east shore, Glenade, Manorhamilton (G831457), 31 March 2008, EPA (DAM). L. Glencar, Glencar (G748434), 1 April 2008, EPA (DAM): **HA 36** - L. Drumlaheen, Feenagh, Ballinamore (H091071), 11 April 2007, EPA (DAM). **MAYO: HA 26** - L. Nanoge, Urlaur (M506903), 24 April 2008, EPA (DAM): **HA 30** - L. Mask, west shore, Toormakeady (M097647), 14 April 2008, EPA (DAM): **HA 32** - L. Feeagh, Newport (L975983), 11 April 2008, BK/RL (DAM): **HA 34** - L. Conn, west shore (G165144), 15 April 2008, EPA (DAM). L. More, Ballynagoraher (G115044), 4 April 2006, EPA (DAM). **MONAGHAN: HA 36** - L. Drumlona, Rockcorry (H636176), 4 April 2007, EPA (DAM). **ROSCOMMON: HA 26** - L. Meelagh, Keadew (G901117), 15 April 2008, EPA (DAM). Cavetown L., Boyle (M832974), 9 April 2008, EPA (DAM). Grange L., Greywood, Strokestown (M938857), 8 April 2008, EPA (DAM). **SLIGO: HA 34** - L. Talt, Gleneask (G402151), 10 April 2008, EPA (DAM). **WESTMEATH: HA 7** - L. Lene, (N510685), 26 April 2006, EPA (DAM). **HA 26** - L. Killinure, Wineport (N067458) and Ballaghkeernan Bay (N069445), 24 April 2007, EPA (DAM). **WICKLOW: HA 9** - Pollaphuca Reservoir, Ballymore Eustace (N995080), 30 April 2009, EPA (DAM): **HA 10** - Vartry Reservoir, Roundwood (O205050), 6 April 2009, EPA (DAM).

***Procladius (Holotanypus) culiciformis* (Linnaeus, 1767)**

**MAYO: HA 32** - R. Owenwee, Belclare, Westport (L960820), July 1911, PHG (Grimshaw, 1912). Knappagh, Westport (L980805), July 1911, PHG (Grimshaw, 1912). Lough near

Westport (L9984), July 1911, PHG (Grimshaw, 1912). Demesne, Westport (L990845), July 1911, PHG (Grimshaw, 1912). L. Clogher (Clogher L.), Clogher, Westport (M035884), July 1911, PHG (Grimshaw, 1912).

***Procladius (Holotanypus) sagittalis* (Kieffer, 1909)**

**ANTRIM: Rathlin Island** - L. Ally (D154497), 24 July 2000 (Langton, 2002) and 5 July 2004 (PHL). L. Craigmacagan (D154498), 24 July 2000 (Langton, 2002) and 5 July 2004 (PHL). No name Lough (D095505), 24 July 2000 (Langton, 2002). *Menyanthes* pool (D123515), 6 July 2004 (PHL). L. Nachiule (D160521), 24 July 2000 (Langton, 2002): **HA 3** - Leslie Hill pool, Ballymoney (C935263), 26 September 1999 (PHL). L. Neagh, Churchtown Point (J056852), 22 August 2001 and 22 May 2011 (PHL). Templewell Pond, Templepatrick (J232856), 26 July 2008 (PHL). Killylane Reservoir, Magherabane, Larne (J292985), 8 May 1999 (PHL): **HA 5** - L. Mourne, Carrickfergus (J415924), 4 May and 8 May 1999 (PHL). **CAVAN: HA 7** - L. Acurry, Baileborough (N584990), 12 June 2007, EPA (DAM): **HA 36** - Glasshouse L., Killashandra (H270060), 18 July 2007, EPA (DAM): **HA 36** - L. Gowna, south basin, Dring (N300856), 18 April 2007, EPA (DAM). **CLARE: HA 25** - L. Graney (R568907), 24 May 2003 (PHL). L. Alewnaghta, west shore, Whitegate (R758908), 16 July 2009, EPA (DAM): **HA 27** - L. Bunny, south east shore, Aughrim (R377965), 2 May 2006, EPA (EPA). L. Cullaun, Corrofin (mid east shore) (R317905), 5 April 2006, EPA (EPA). L. Muckanagh, Tubber, Corrofin (R368926), 7 June and 3 July 2006, EPA (EPA). L. Rosroe, south east shore, Newmarket on Fergus (R442681), 12 August 2009, EPA (DAM): **HA 28** - L. Acrow, Lisscasey (R193687), 8 June and 7 July 2006, EPA (DAM). **CORK: HA 19** - Iniscarra Reservoir, Coachford (W477717), 28 July 2008, EPA (DAM): **HA 21** - L. Reenydonegan, Bantry (W000515), 19 May 1969, NH (Bracken and Murray, 1973). **DERRY: HA 1** - inflow to Upper Reservoir, Creggan, Derry (C413171), 10 May 2001 (PHL): **HA 2** - Binevenagh pond, Coleraine (C691305), 18 May and 16 September 2000 (Langton, 2002), also 25 August 2001 (PHL); fire dam, Binevenagh Forest, Coleraine (C699304), 18 May 2000 (Langton, 2002): **HA**

3 - Howell's Tarn, Ballywildrick, Coleraine (C766325), 21 April and 7 July 2002 (PHL). Downhill Lake, Downhill Forest, Coleraine (C757354), 21 August 2001 and 24 March 2002 (PHL). Bishops Gate Garden, Coleraine (C762355), 21 August 2001 (PHL). Glenullin Bog, Garvagh (C795132), 7 June 2008 (PHL). R. Bann, Coleraine (C854304), 13 May, 31 May, 23 June, 4 July and 7 September 1999 (PHL), 3 July, 24 July 2000 and 26 April 2001 (PHL). Pond 1, Magherafelt Golf Course, Traad Point (H950873), 10 May 2000 (Langton, 2002). L. Neagh, Ballyronan (H948862), 4 May 1999 and 22 August 2001 (PHL). **DONEGAL: HA 36** - L. Golagh, Ballyshannon (G965655), 8 June and 7 July 2009, EPA (DAM): **HA 37** - L. Shinvagh, Carricode (H005675), 27 April 2002 (PHL): **HA 38** - L. Scalpachore, Cruit Island (B730216) and L. Mulladerg, The Rosses (B775199), 19 July 2000 (Langton, 2002). L. Naweelogue, Glenveagh (B974185), 5 June 1986 (Heneghan, 1986). L. an tSeisigh, Portnablagh (Sheephaven) (C043361), 16 June 2009, EPA (DAM). L. Voriskey, The Rosses (B762176), 19 July 2000 (Langton, 2002): **HA 39** - L. Gartan, north shore, Church Hill (C065173), 18 July 2000 (Langton, 2002). R. Leannan, Drumaboden (C165218), 12 August 1982 (Hayes, 1991). L. Fern, Milford (C182247), 18 August 2011 (PHL). L. Swilly, Inch Island empoundment, Inch (C346240), 18 August 2011 (PHL). **DOWN: HA 5** - Bow L., Ballynahinch (J354577), 22 June 2000 (Langton, 2002). **DUBLIN: HA 9** - Upper Reservoir, Bohernabreena (O095219), 9 May 1947 (Fitzgerald, 1947). **FERMANAGH: HA 35** - L. Melvin, Garrison (G938518), 29 June 2000 (Langton, 2002): **HA 36** - L. Erne Upper, slipway (H362242), 27 June 2000 (Langton, 2002). L. Erne Lower, Boa Island (H108626), 29 June 2000 (Langton, 2002). L. Inver (Inver L.), Rosslea (H518314), 28 June 2000 (Langton, 2002). L. Killyfole (Mill L.), Rosslea (H464314), 28 June 2000 (Langton, 2002). L. Lattone, Kiltyclogher (H003456), 29 June 2000 (Langton, 2002). L. Eyes, Lisbellaw (H324434), 16 August 2011 (PHL). **GALWAY: HA 25** - L. Derg, Woodford (M794964), 24 May 2003 (PHL): **HA 30** - L. Ballyquirke, Moycullen (M232317), 8 August 2007, EPA (DAM). L. Corrib, no data (M150450), 1980, BC (DAM); L. Corrib (M150450), 1 August 1964 (Murray, 1972). L. Ross, Moycullen (M200363), 24 May 2003 (PHL). **KILDARE: HA 7** - R. Boyne, Leinster Bridge (N665435), 5 July 1991 (DAM).

**LOUTH: HA 6** - L. Mentrim, Ardee (N913879), 27 June 2005, DAM/WM (DAM). **MAYO: HA 33** - L. Cross, Drumreagh, Belmullet (F651299), 17 June, 14 August and 17 September 2008, EPA (DAM). L. Bunacurry, Achill Island (F695048), 29 September 2004, DAM/WM (DAM). Bog pools, Glenamoy (F896345), 1973, CD (Dowling and Murray, 1981): **Clare Island** - Creggan L., Lecarrow (L689857), June to October 1998 and June to August 1999 (Fahy, 2002). L. Poirtin Fuinch (L706857), 10 June 1999 to 20 August 1999 (Fahy, 2002). **MEATH: HA 7** - tailings pond interceptor ditch, Randalstown, Navan (N857717), 29 August 1995 (Finnegan, 1998); tailings pond, Randalstown, Navan (N845714), 22 June and 29 August 1995 (Finnegan, 1998). **MONAGHAN: HA 36** - L. Inner, Dartery, Drum (H625173), 5 April, 6 June and 9 September 2007, EPA (DAM). **OFFALY: HA 25** - bog lake 1, Turraun (N172185), 1 June 1998 (DAM) and 3 June 1999 (Murray, 2005). R. Shannon, Shannon Bridge (M967254), 15 August 1981, BPH (Hayes, 1991; Murray, 2005). **ROSCOMMON: HA 26** - L. Annaghmore, Strokestown, Elphin (M902838), 12 June 2008, EPA (DAM). **WATERFORD: HA 16** - Ballyscanlan Reservoir, Tramore (S540030), 22 April 2009, EPA (DAM). L. Knockaderry, Knockaderry (S496062), 2 April 2009, EPA (DAM): **HA 17** - Belle Lake, Dunmore East (S665049), 22 April and 1 September 2009, EPA (DAM). L. Carrigavantry, Tramore (S548022), 21 April and 3 July 2009, EPA (DAM). **WESTMEATH: HA 25** - L. Ennell, Tudenham (N415466), 26 January 1966 (Murray, 1972): **HA 36** - L. Bane, Collinstown (N550712), 26 April and 26 June 2006, EPA (EPA).

***Procladius (Holotanypus) signatus* (Zetterstedt, 1850)**

**CAVAN: HA 26** - L. Sheelin, Kilnahard (N435860), 1 May 1980 (DAM): **HA 36** - L. Ardan, Milltown, Belturbet (H354124), 11 April 2007, EPA (DAM). L. Gowna, south basin, Dring (N300856), 18 April 2007, EPA (DAM). **CLARE: HA 27** - Gortglass L., south shore, Killadysert (R223596), 2 April 2009, EPA (DAM). L. Inchicronan, west basin, Crusheen (R391860), 8 April 2009, EPA (DAM). L. Rosroe, south east shore, Newmarket on Fergus (R442681), 12 August 2009, EPA (DAM). L. Atedaun, Corrofin (R297884), 21 April 2009,

EPA (DAM): **HA 28** - L. Keagh, south west shore, Milltown Malbay (R100811), 8 July 2009, EPA (DAM). **CORK: HA 19** - Iniscarra Reservoir, Coachford (W477717), 28 July 2008, EPA (DAM). **DERRY: HA 3** - L. Neagh, unspecified (H900800), no date, anon. (McLarnon and Carter, 2000). **DONEGAL: HA 36** - L. Unshin, Ballyshannon (G951637), 8 June 2009, EPA (DAM): **HA 37** - Carn L., Blue Stack Mountains (G871886), 27 July 2005, JRB (Murray, 2005): **HA 38** - L. Mulladerg, The Rosses (B775199), 19 July 2000 (Langton, 2002). L. Keel, Crolly (B848162), 17 June and 7 September 2009, EPA (DAM). L. Veagh, north east shore, Glenveagh (C038233), 31 August 1985 (Heneghan, 1986). L. Glen, Glen (C105292), 16 June 2009, EPA (DAM). L. Kinny, Fanad (C204442), 21 July 2009, EPA (DAM). L. Shannagh, Magheradrumman, Fanad Peninsula (C216450), 13 August 1982, BPH (DAM): **HA 39** - L. Nambraddan, GNP, Glenveagh (C022193), 31 July 1985 (Heneghan, 1986). **DOWN: HA 5** - L. Henney, Ballynahinch (J348586), 22 June 2000 (Langton, 2002). **FERMANAGH: HA 35** - L. Melvin, Garrison (G938518), 29 June 2000 (Langton, 2002). **GALWAY: HA 29** - L. Caherglassaun, Gort (M412061), 13 June 2007, EPA (DAM): **HA 30** - L. Bofin, Maam Cross (M034441), 31 July 2007, EPA (DAM). L. Maumwee, Maam Cross (L977485), 19 April 2007, EPA (DAM). Lay-by on road N59, Moycullen (M204336), pool and nearby stream, 25 May 2003 (PHL): **HA 32** - L. Ballynakill, Cleggan (L639581), 11 July and 11 September 2007, EPA (DAM). **KERRY: HA 22** - L. Leane, Killarney, Castletlough Bay, north (V966866), 18 May 1973, DAM (Douglas and Murray, 1980; Murray, 2005); Killarney (V931886), 10 July and 18 September 2008, EPA (DAM). Upper Lake, Killarney (V909821), 17 July 2008, EPA (DAM). **LEITRIM: HA 26** - L. Boderg, Dromod (N020910), 25 June 2008, EPA (DAM): **HA 35** - L. Glenade, south east shore, Glenade, Manorhamilton (G831457), 22 July 2008, EPA (DAM). **LONGFORD: HA 26** - L. Forbes, Cloonard, Newtownforbes (N084821), 27 August and 10 September 2008, EPA (DAM). **MAYO: HA 32** - L. Doo, Delphi, north east shore (L834689), 22 August 2002, DAM/WM (DAM) and west shore (L835681), 12 July 2006, EPA (DAM): **HA 33** - L. Keel, Achill Island (F651059), 16 July 2008, EPA (DAM). **MONAGHAN: HA 6** - L. Monalty, Carrickmacross (H866027), 14 September 2007, EPA (DAM): **HA 36** - L.

Drumlona, Rockcorry (H636176), 5 June and 11 July 2007, EPA (DAM). **SLIGO: HA 26** - L. Gara, Cuppanagh, Cloonlough (G714013), 26 June 2008, EPA (DAM) and Monastredan (M708996), 5 September 2008, EPA (DAM): **HA 35** - L. Arrow, Ballinafad (G789123), 29 April 2008, EPA (DAM). L. Gill (G782350), 11 June and 20 August 2008, EPA (DAM). **WESTMEATH: HA 7** - L. Lene (N510685), 26 April 2006, EPA (DAM): **HA 26** - L. Owel, Mullingar (N421566), 9 August 1979, NH (Hayes, 1980). L. Killinure, Wineport (N067458), 24 April 2007, EPA (DAM).

***Procladius (Holotanypus) simplicistilus* Freeman, 1948**

**ANTRIM: HA 4** - Dungonnell Dam, Newtown Crommelin (D193170), 20 June 2000 (Langton, 2002). **CAVAN: HA 36** - L. Gowna, north basin, Arnagahan (N285920), 24 July 2007, EPA (DAM). **CLARE: HA 25** - L. Graney, Doorus, west shore (R556930), 3 August 2006, EPA (DAM): **HA 27** - L. Bunny, south east shore, Aughrim (R377965), 10 May 2005, 7 June and 1 August 2006, EPA (EPA). L. Cullaun, Corrofin (mid east shore) (R317905), 7 June 2006, EPA (EPA). L. Dromore, Ruan, Corrofin, west shore (R345858), 8 April 2009 and mid lake (R352864), 16 June 2009, EPA (DAM). Gortglass L., south shore, Killadysert (R223596), 7 July 2009, EPA (DAM). L. Inchiquin, west shore, Corrofin (R266896), 15 July 2009, EPA (DAM). L. Muckanagh, Tubber, Corrofin (R368926), 3 April and 7 June 2006, EPA (DAM): **HA 28** - L. Keagh, Milltown Malbay (R100813), 1 April 2009, EPA (DAM). **CORK: HA 19** - Carrigdroihid Reservoir, Ashton (W360703), 3 April 2008, EPA (DAM). L. Allua, Ballingearry (W180652), 17 June 2008, EPA (DAM): **HA 20** - L. Skeagh (Schull Reservoir), Schull (V937338), 8 April 2008, EPA (DAM): **HA 21** - L. Bofinna, Bantry (W041488), 8 April 2008, EPA (DAM). L. Reenydonegan, Bantry (W000515), 8 September 1969, NH (Bracken and Murray, 1973). **DERRY: HA 3** - L. Neagh, Ballyronan (H948862), 10 May 2000 (Langton, 2002). **DONEGAL: HA 36** - L. Golagh, Ballyshannon (G965655), 7 July 2009, EPA (DAM): **HA 37** - L. Eske, Donegal (G973844), 17 April and 14 July 2009, EPA (DAM): **HA 38** - L. Mulladerg, The Rosses (B775199), 19 July 2000 (Langton, 2002). L. Dunglow, west shore,

Dunglow, The Rosses (B782119), 17 June 2009, EPA (DAM); L. Dunglow, east shore, Dunglow (B787117), 19 July 2000 (Langton, 2002). L. Nacung (Upper), Dunlewy (B904191), 19 July 2000 (Langton, 2002). L. Dunlewey, Dunlewy (B926193), 19 July 2000 (Langton, 2002). L. Barra, Commeen (B935119), 22 April and 10 June 2009, EPA (DAM). L. Veagh, GNP, Glenveagh Castle shore (C038230), 28 June 1984 (DAM) and north east shore (C038233), 24 July 1985 (Heneghan, 1986). L. Glen, Glen (C105292), 16 June 2009, EPA (DAM). L. Shannagh, Magheradrumman, Fanad Peninsula (C216450), 21 July 2009, EPA (DAM). L. Kiltoris, Dawros, Ardara (G675976), 17 June 2009, EPA (DAM): **HA 39** - L. Gartan, Church Hill (C055159), 10 June 2009, EPA (DAM). L. Gartan, north shore, Church Hill (C065173), 18 July 2000 (Langton, 2002). **DOWN: HA 5** - L. Henney, Ballynahinch (J348586), 22 June 2000 (Langton, 2002). Bow L., Ballynahinch (J354577), 22 June 2000 (Langton, 2002). **FERMANAGH: HA 35** - L. Melvin, Garrison (G938518), 29 June 2000 (Langton, 2002): **HA 36** - L. Macnean, Upper, Belcoo (H042403) and L. Macnean, Lower (H085384), 29 June 2000 (Langton, 2002). **GALWAY: HA 30** - L. Beaghcauneen, Ballinaboy (L679470), 6 June 2007, EPA (DAM). L. Bofin, Maam Cross (M034441), 18 April and 7 June 2007, EPA (DAM). L. Corrib (M1545), 1980, BC (DAM); L. Corrib Lower, Moycullen (M271360), 11 April 2007, EPA (DAM). L. Lettercraffroe, Oughterard (M056376), 18 April and 14 June 2007, EPA (DAM). L. Ross, Moycullen (M188365), 13 April 2007, EPA (DAM): **HA 31** - L. Anaserd, Ballyconneely (L605443), 20 June and 17 July 2007, EPA (DAM). L. Ballynahinch, Ballynahinch (L777478), 6 June 2007, EPA (DAM). L. Loughanaure, Kilkieran (L828320), 7 June and 24 July 2007, EPA (DAM): **HA 32** - L. Tully, Tully Cross (L695618), 3 April 2007, EPA (DAM). L. Nambrackmore, Ballinaboy, Toombeola (L716454), 6 June 2007, EPA (DAM). **KERRY: HA 21** - L. Inchiquin, Kenmare (V837629), 15 April and 18 June 2008, EPA (DAM): **HA 22** - L. Guitane, Crohane, Killarney (W025846), 8 July 2008, EPA (DAM). **LEITRIM: HA 26** - L. Natire (G966340), 14 April 2005, JRB (DAM): **HA 35** - L. Nabrack, Crocknagapple (G860477), 29 April 2005, JRB (DAM). L. Sandy, Crocknagapple (G891448), 28 April 2005, JRB/MC (Murray, 2005): **HA 36** - L. Drumlaheen, Feenagh, Ballinamore



(H091071), 11 April and 17 July 2007, EPA (DAM). **LIMERICK: HA 24** - Bleach Lake, Pallaskenry (R441569), 28 July 2009, EPA (DAM). **LONGFORD: HA 26** - L. Forbes, Cloonard, Newtownforbes (N084821), 25 June 2008, EPA (DAM). L. Ree, Bleanavoher (N069445), 25 April 2007, EPA (DAM). **MAYO: HA 26** - L. Nanoge, Urlaur (M506903), 24 April 2008, EPA (DAM): **HA 30** - L. Carra, Keel Bridge, Ballinrobe (M165680), 28 April and 19 June 2008, EPA (DAM): **HA 32** - L. Moher, Lisarneey, Westport (L977766), 21 April 2008, EPA (DAM): **HA 33** - L. Carrowmore, Bangor Erris, Cloontakilla Bay (F851253), 17 June 2008 and Derreens (F833299), 28 July 2008, EPA (DAM). **MONAGHAN: HA 36** - L. Annaghmakerrig, Newbliss (H585205), 19 September 2006, EPA (DAM). L. Corconnolly, Clones (H510247), 19 May 1964, NH (Murray, 1972). **ROSCOMMON: HA 26** - L. Ree, Barley Harbour, Yew Point (N018485), 25 April 2007, EPA (DAM). L. Meelagh, Keadew (G901117), 15 April 2008, EPA (DAM). L. Cavetown, Boyle (M832974), 9 April 2008, EPA (DAM). L. Key, pier, Hogs Island, Boyle (G825054), 9 September 2008, EPA (DAM). **SLIGO: HA 35** - L. Arrow, Ballinafad (G789123), 29 April 2008, EPA (DAM). **TIPPERARY: HA 18** - Black L., Arra Mountains (R738771), 4 May 2005, JRB (DAM). **WATERFORD: HA 16** - L. Knockaderry, Knockaderry (S496062), 2 April 2009, EPA (DAM). **WESTMEATH: HA 26** - L. Killinure, Wineport (N067458), 24 April 2007, EPA (DAM): **HA 36** - L. Bane, Collinstown (N550712), 26 April 2006, EPA (EPA). **WICKLOW: HA 9** - Pollaphuca Reservoir, Ballymore Eustace (N995080), 30 April 2009, EPA (DAM).

***Procladius (Holotanypus) sagittalis/signatus* sensu Langton and Visser, 2003**

(=*Procladius (Holotanypus) Pe 3*)

**CLARE: HA 27** - L. Bridget, east shore, Derrymore, Badyke (R558797), 17 September 2009, EPA (DAM). L. Muckanagh, Tubber, Corrofin (R370922), 11 June 2009, EPA (DAM): **HA 29** - L. Skeardeen, Kilcorkan (R388991), 17 June 2009, EPA (DAM): **HA 25** - L. Derg, d/s Killaloe (M705715), 21 April 2009 and Mountshannon (R718861), 18 September 2009, EPA (DAM). L. Alewnaghta, west shore, Whitegate (R758908), 17 June 2009, EPA (DAM): **HA 27**

- L. Dromore, Ruan, Corrofin, west shore (R345858), 21 July 2009 and mid lake (R352864), 16 June 2009, EPA (DAM). Gortglass L., south shore, Killadysert (R223596), 7 July 2009 and north shore, Killadysert (R223599), 11 June and 15 September 2009, EPA (DAM). L. Inchiquin, south east shore, Corrofin (R272894), 17 September 2009, EPA (DAM). L. Rosroe, Newmarket on Fergus south east shore (R442681), 12 August 2009 and north east shore (R449697), 16 September 2009, EPA (DAM): **HA 28** - L. Doo, Milltown Malbay (R123721), 8 July 2009, EPA (DAM). L. Keagh, Milltown Malbay, south west shore (R100811), 8 July 2009, also north shore (R100813), 11 June and 15 September 2009, EPA (DAM). L. Lickeen, Kilfenora, west shore (R163909), 11 June, 21 July and 15 September 2009, EPA (DAM). L. Naminna, Boolteagh (R178710), 7 July 2009, EPA and 11 June 2009, EPA (DAM). **CORK:** **HA 19** - Carrigdroihid Reservoir, Ashton (W360703), 14 August and 16 September 2008, EPA (DAM). Iniscarra Reservoir, Coachford (W477717), 16 June, 31 July and 16 September 2008, EPA (DAM): **HA 20** - L. Ballin, Leap (W199389), 17 June and 17 September 2008, EPA (DAM). L. Coolklure, Dunmanway (W177539), 17 June and 16 September 2008, EPA (DAM). L. Curraghally, Drinagh, Dunmanway (W234046), 17 June and 11 September 2008, EPA (DAM). L. Skeagh (Schull Reservoir), Schull (V937338), 17 September 2008, EPA (DAM). **DONEGAL:** **HA 1** - L. Finn, Fintown, Glenties (B911018), 23 July 2009, EPA (DAM): **HA 38** - L. Dunglow, west shore, Dunglow (The Rosses) (B782119), 17 June and 5 August 2009, EPA (DAM). L. Nasnahida, Doocharry, Dunglow (B852076), 17 June 2009, EPA (DAM). L. Kindrum, Kindrum, Fanad (C186430), 9 September 2009, EPA (DAM). L. Kiltoris, Dawros, Ardara (G675976), 17 June 2009, EPA (DAM): **HA 39** - L. Akibbon, Church Hill (C068184), 22 July and 9 September 2009, EPA (DAM). L. Fern, Millford (C180233), 23 July 2009, EPA (DAM). **GALWAY:** **HA 29** - L. Coole, Gort (M432043), 15 June and 27 July 2009, EPA (DAM): **HA 31** - L. Anaserd, Ballyconneely (L605443), 10 July 2006, EPA (DAM). **KERRY:** **HA 21** - L. Cloonaghlin, Waterville (V611708), 8 May, 19 June and 24 July 2008, EPA (DAM). L. Currane, Waterville (V535664), 22 July 2008, EPA (DAM). L. Namona, Waterville (V596711), 19 June 2008, EPA (DAM): **HA 22** - L. Guitane, Crohane, Killarney (W025846), 8

July 2008, EPA (DAM). Muckcross Lake, Muckcross, Killarney (V950853), 16 July 2008, EPA (DAM): **HA 23** - L. Gill, Castlegregory (Q603139), 29 April and 28 August 2008, EPA (DAM). **LIMERICK: HA 24** - Bleach Lake, Pallaskenry (R441569), 28 July 2009, EPA (DAM). L. Gur, Holycross (R646413), 13 June 2009, EPA (DAM). **MAYO: HA 30** - L. Mask, west shore, Toormakeady (M113702), 24 June 2008, EPA (DAM): **HA 32** - L. Doo, Delphi, west shore (L833680), 25 August 2008, EPA (DAM). L. Glencullin, Delphi, south west shore (L819696), 25 August 2008 and north shore (L818711), 26 June and 22 September 2008, EPA (DAM): **HA 33** - L. Keel, Achill Island, south east shore (F650051), 17 June 2008, EPA (DAM): **HA 34** - L. Conn, Brackwansha (G191098), 18 June 2008, EPA (DAM): **HA 26** - L. Nanoge, Urlaur (M506903), 27 August 2008, EPA (DAM): **HA 30** - L. Carra, Keel Bridge, Ballinrobe (M165680), 28 April 2008, EPA (DAM): **HA 32** - L. Feeagh, Newport (L975983), 25 June, 24 July and 17 September 2008, EPA (DAM). L. Moher, Liscarney, Westport (L977766), 21 July and 18 September 2008, EPA (DAM). L. Knappabeg, Westport (M010803), 23 July and 18 September 2008, EPA (DAM). **SLIGO: HA 35** - L. Easky, Ox Mountain (G446230), 18 June and 17 July 2008, EPA (DAM). **TIPPERARY: HA 25** - L. Derg, Dromineer (M809858), 17 June 2009, EPA (DAM). **WATERFORD: HA 17** - Belle Lake, Dunmore East (S665049), 2 July 2009, EPA (DAM).

***Procladius (Holotanypus) Pe4 (sensu Langton and Visser, 2003)***

**CLARE: HA 25** - L. Graney, Doorus (R557924), 11 August 2009, EPA (DAM): **HA 27** - L. Bridget, Derrymore, Badyke (R558797), 29 July 2009, EPA (DAM). L. Bunny, south east shore, Aughrim (R377965), 4 July 2006 and 14 July 2009, EPA (DAM). L. Cullaun, Corrofin, east shore (R317905), 22 July 2009, EPA (DAM). L. Dromore, west shore, Ruan, Corrofin (R345858), 21 July 2009, EPA (DAM). L. Inchiquin, south east shore, Corrofin (R272894), 16 June 2009, EPA (DAM). **CORK: HA 19** - Iniscarra Reservoir, Coachford (W477717), 28 and 31 July 2008, EPA (DAM). **GALWAY: HA 29** - L. Coole, Gort (M432043), 15 June 2009, EPA (DAM). **LEITRIM: HA 35** - L. Glenade, south east shore, Glenade, Manorhamilton

(G831457), 22 July 2008, EPA (DAM). **LONGFORD: HA 26** - L. Forbes, Cloonard, Newtownforbes (N084821), 25 June and 27 August 2008, EPA (DAM). **MAYO: HA 34** - L. Conn, south basin, Illannaglashy (G207070), 20 August 2008, EPA (DAM). L. Lannagh, west shore, Castlebar (M109883), 21 August 2008, EPA (DAM). L. Washpool, Ballycarra (M219842), 15 August 2008, EPA (DAM): **HA 30** - L. Carra, Keel Bridge, Ballinrobe (M165680), 19 June 2008, EPA (DAM): **HA 32** - L. Moher, Liscarney, Westport (L977766), 24 June 2008, EPA (DAM). **SLIGO: HA 26** - L. Gara, Monastredan (M708996), 28 April 2008, EPA (DAM): **HA 34** - L. Talt, Gleneask (G402151), 15 July 2008, EPA (DAM).

***Procladius (Holotanypus) sp. nr vesus* Roback (sensu Langton, 1991)**

**GALWAY: HA 30** - L. Corrib Upper, Oughterard (M138486), 14 August 2007, EPA (Murray, 2010).

***Procladius (Psilotanypus) flavifrons* Edwards, 1929**

**CAVAN: HA 7** - L. Nadreegeal, Ballyjamesduff (N537933), 2 May 2007, EPA (DAM). L. Acurry, Baileborough (N584990), 12 June 2007, EPA (DAM): **HA 36** - L. Cuillaghan, Ballyconnell (H303183), 6 June 2007, EPA (DAM). **CORK: HA 19** - L. Allua, Ballingearry (W180652), 17 June 2008, EPA (DAM). **DONEGAL: HA 36** - L. Vearty, Ballyshannon (G995658), 8 July 2009, EPA (DAM). **GALWAY: HA 30** - L. Anillaun, Maam Cross (L980470), 8 June 2007, EPA (DAM). L. Ballyquirke, Moycullen (M232317), 8 August 2007, EPA (DAM): **HA 31** - L. Ballynahinch, Ballynahinch (L777478), 6 June 2007, EPA (DAM). L. Derryclare, Recess (L825485), 16 July 2007, EPA (DAM): **HA 32** - L. Aughrusbeg, Cleggan (L557582), 10 July 2007, EPA (DAM). L. Ballynakill, Cleggan (L639581), 11 July 2007, EPA (DAM). L. Pollacappul, Kylemore (L754582), 9 July 2007, EPA (DAM). **KERRY: HA 22** - Killarney (V9080), 1929, FWE (Edwards, 1929). L. Leane, Killarney, Castlelough Bay, east (V975873), 27 June 1973, JPOC (Douglas and Murray, 1980); L. Leane, Killarney, Castlelough Bay, north (V966866), 27 June 1973, DJD/DAM (Murray, 2005). Muckcross Lake, Dundag Bay

(V964858), 23 July 1973 (Murray, 2005) and 30 July 1973 (DAM). **LEITRIM: HA 35** - L. Glencar, Glencar (G757435), 10 June 2008, EPA (DAM). **MAYO: HA 32** - L. Moher, Lisscarney, Westport (L977766), 24 June, 21 July and 18 September 2008, EPA (DAM). L. Ballin, north shore, Westport (L996882), 25 June and 18 September 2008, EPA (DAM): **HA 34** - L. Lannagh, west shore, Castlebar (M109883), 23 April 2008, EPA (DAM). L. Washpool, Ballycarra (M219842), 19 June 2008, EPA (DAM). **ROSCOMMON: HA 26** - L. Meelagh, Keadew (G901117), 11 June 2008, EPA (DAM).

***Procladius (Psilotanypus) lugens* Kieffer, 1915**

**CAVAN: HA 7** - L. Drumkeery, Baileborough (H663002), 1 May 2007, EPA (DAM). L. Mullagh, Mullagh (N680856), 23 May 1968 (Murray, 1972); L. Mullagh, Mullagh (N680856), 9 May 1994 (Murray, 2005): **HA 36** - L. Sillan, Shercock (H705067), 19 April 2007, EPA (DAM). **GALWAY: HA 30** - L. Corrib (M150450), 1980, BC (DAM). **MAYO: HA 32** - L. Knappabeg, Westport (M010803), 21 April and 24 June 2008, EPA (DAM). **MONAGHAN: HA 36** - L. Annaghmakerrig, Newbliss (H585205), 22 May 2006, EPA (DAM). L. Avagnon, Latton, Cotehill (H688133), 11 July 2007, EPA (DAM). L. Drumore, Drum (H614164), 2 May 2007, EPA (DAM). L. Inner, Dartery, Drum (H625173), 5 April 2007, EPA (DAM). **WATERFORD: HA 16** - Ballyscanlan Reservoir, Tramore (S540030), 22 April 2009, EPA (DAM). L. Ballyshunnock (Reservoir), Portlaw (S455095), 20 April 2009, EPA (DAM): **HA 17** - Belle Lake, Dunmore East (S665049), 22 April 2009, EPA (DAM).

***Procladius (Psilotanypus) rufovittatus* (van der Wulp, 1874)**

**ANTRIM: Rathlin Island** - Ushet L. (D154485), 5 July 2004 (PHL). **CAVAN: HA 7** - L. Mullagh, Mullagh (N680856), 14 June 1968, DAM (Murray, 1972): **HA 36** - L. Garty, Arvagh (N278978), 7 June and 18 July 2007, EPA (DAM). L. Gowna, north basin, Arnagahan (N285920), 7 June 2006 and 24 July 2007, EPA (DAM). L. Sillan, Shercock (H705067), 19 April 2007, EPA (DAM). **CLARE: HA 25** - L. Graney, Doorus, west shore (R556930), 6 July

2006, EPA (DAM). L. Alewnaghta, west shore, Whitegate (R758908), 17 June 2009, BK (DAM): **HA 27** - L. Bridget, east shore, Derrymore, Badyke (R558797), 29 July 2009, EPA (DAM). Gortglass L., Killadysert, south shore (R223596), 7 July 2009 and north shore (R223599), 11 June 2009, EPA (DAM). L. Inchiquin, Corrofin, west shore (R266896), 15 July 2009, EPA (DAM). **CORK: HA 19** - Carrigdroihid Reservoir, Ashton (W360703), 16 September 2008, EPA (DAM). Iniscarra Reservoir, Coachford (W477717), 31 July and 16 September 2008, EPA (DAM). L. Aderry, Castlemartyr (W935730), 27 August 1969, NH (Bracken and Murray, 1973). L. Allua, Ballingearry (W180652), 17 June 2008, EPA (DAM): **HA 20** - L. Curraghally, Drinagh, Dunmanway (W234046), 12 August and 11-September 2008, EPA (DAM): **HA 21** - L. Avaul, Glengarriff (V910553), 1969, NH (Bracken and Murray, 1973). L. Bofinna, Bantry (W041488), 18 June and 13 August 2008, EPA (DAM). **DERRY: HA 3** - reservoir, Balinrees, Coleraine (C794300), 9 June 2000 (Langton, 2002). **DONEGAL: HA 37** - L. Eske, Donegal (G973844), 14 July 2009, EPA (DAM): **HA 38** - L. Dunglow, The Rosses, west shore (B782119), 7 September 2009, EPA (DAM): **HA 39** - L. Gartan, Church Hill (C055159), 10 June 2009, EPA (DAM). L. Akibbon, Church Hill (C068184), 11 June 2009, EPA (DAM). L. Fern, Milford (C182247), 18 July 2011 (PHL). **DOWN: HA 5** - L. Henney, Ballynahinch (J348586), 22 June 2000 (Langton, 2002). **FERMANAGH: HA 36** - L. Erne Upper, slipway (H362242), 27 June 2000 (Langton, 2002). **GALWAY: HA 25** - L. Derg, Woodford (M794964), 24 May 2003 (PHL): **HA 29** - L. Coole, Gort (M425037), 27 July 2009, EPA (DAM): **HA 30** - L. Corrib (M1545), 1980, BC (DAM). L. Ross, Moycullen (M188365), 8 August and 5 September 2007, EPA (DAM): **HA 31** - L. Aunwillan, Carraroe (L936255), 25 July 2007, EPA (DAM). **KERRY: HA 22** - L. Caragh, Killorglan (V719904), 20 June and 15 July 2008, EPA (DAM). Doolough, Muckross Peninsula (V949860), 3 July 1973 (Douglas and Murray, 1980). L. Guitane, Crohane, Killarney (W025846), 8 July 2008, EPA (DAM). L. Leane, Killarney, Castlelough Bay, north (V966866), 27 June 1973, JPOC (Douglas and Murray, 1980; Murray, 2005); Juniper Bay (V949863), 11 June 1973 (Douglas and Murray, 1980); Killarney (V931886), 24 June 2008, EPA (DAM); Boathouse (V965866), 29 August

1987, NOM (DAM). Muckcross Lake, Muckcross, Killarney (V950853), 16 July 2008, EPA (DAM). **LEITRIM: HA 26** - L. Boderg, Derrycarne, north west shore (N013915), 29 July 2008, EPA (DAM). L. Bofin, Dromod (N049894), 24 June 2008, EPA (DAM): **HA 35** - L. Belhavel, Killarga, Dromahair (G878288), 26 August 2008, EPA (DAM). L. Glenade, south east shore, Glenade, Manorhamilton (G831457), 10 June and 22 July 2008, EPA (DAM). **LONGFORD: HA 26** - L. Forbes, Cloonard, Newtownforbes (N084821), 25 June, 27 August and 10 September 2008, EPA (DAM). **MAYO: HA 30** - L. Corrib Upper, Oughterard, Kitten's Bay (M110463), 25 June 2010, JRB (DAM): **HA 32** - L. Knappabeg, Westport (M010803), 23 July 2008, EPA: **HA 34** - L. Levally, Massbrook (G146043), 25 June 2008, EPA (DAM). **MONAGHAN: HA 36** - L. Annaghmakerrig, Newbliss (H585205), 27 June 2006, EPA (DAM). L. Corconnolly, Clones (H510247), 19 May 1964, NH (Murray, 1972). L. Drumlona, Rockcorry (H636176), 5 June 2007, EPA (DAM). L. Inner, Dartery, Drum (H625173), 5 April 2007, EPA (DAM). **ROSCOMMON: HA 26** - L. Meelagh, Keadew (G901117), 11 June 2008, EPA (DAM). L. Annaghmore, Strokestown, Elphin (M902838), 15 July 2008, EPA (DAM). L. Cavetown, Boyle (M832974), 11 June and 17 July 2008, EPA (DAM). L. Glinn, Loughglinn, Castlerea (M629870), 12 June 2008, EPA (DAM). L. Key, Boyle (G838057), 6 August 2008, EPA (DAM) and (G848040), 11 June 2008, EPA (DAM). L. O'Flynn, south east shore, Ballinlough (M585786), 12 June 2008, EPA (DAM). **SLIGO: HA 35** - L. Templehouse, Ballymote (G619182), 11 June and 9 September 2008, EPA (DAM). **TIPPERARY: HA 25** - L. Derg, Dromineer (M809858), 17 June 2009, EPA (DAM). **WATERFORD: HA 16** - Ballyscanlan Reservoir, Tramore (S540030), 19 August 2009, EPA (DAM). Ballyshunnock Reservoir, Portlaw (S455095), 20 April, 19 August and 2 September 2009, EPA (DAM). L. Knockaderry, Knockaderry (S496062), 2 April, 1 July, 19 August and 2 September 2009, EPA (DAM): **HA 17** - Belle Lake, Dunmore East (S665049), 22 April 2009, EPA (DAM). **WESTMEATH: HA 26** - L. Killinure, Wineport (N067458), 26 June 2007, EPA (DAM). L. Ree, Coosan (N050450), 15 August 2007, EPA (DAM): **HA 36** - L. Bane, Collinstown (N550712), 26 June 2006, EPA (EPA). **WICKLOW: HA 10** - Vartry Reservoir,

Roundwood, east shore (O214002), 12 July 1983, HD (DAM) and north basin (O205050), 2 July 2009, EPA (DAM).

***Psectrotanypus varius* (Fabricius, 1787)**

**ANTRIM: HA 3** - Leslie Hill pool, Ballymoney (C935263), 26 September 1999 and 6 October 2002 (PHL): **HA 5** - L. Mourne, Carrickfergus (J415924), 4 May 1999 (PHL). **CAVAN: HA 7** - L. Drumkeery, Baileborough (H663002), 12 June 2007, EPA (DAM). L. Mullagh, Mullagh (N680856), 27 June 2005, DAM/WM (DAM). **CORK: HA 20** - L. Skahannagh, Unionhall (W212332), 17 June 1964 (Murray, 1972). L. Skeagh (Schull Reservoir), Schull (V937338), 27 August 2008, EPA (DAM). R. Bandon, u/s Ballineen (W331537), 27 May 1980 (Morgan, 1982): **HA 21** - L. Avaul, Glengarriff (V910553), 1969, NH (Bracken and Murray, 1973). **DERRY: HA 1** - pool, Creggan, Derry (C414171), 7 May 2002 (PHL): **HA 2** - pool, Roe Valley Park, Limavady (C679201), 9 June 2000 (Langton, 2002): **HA 3** - Howell's Tarn, Ballywildrick, Coleraine (C766325), 7 April, 21 April and 7 July 2002 (PHL). Downhill Lake, Downhill Forest, Coleraine (C757354), 25 July, 28 July, 30 August 1999, also 21 August 2001 and 24 March 2002 (PHL). Magherafelt Golf Course, pond 1, Traad Point (H950873), 10 May 2000 (Langton, 2002); pond 2 (H954873), 10 May 2000 (Langton, 2002). L. Neagh, unspecified (H9080), no date, anon. (McLarnon and Carter, 2000). University Pond, University of Ulster, Coleraine (C846339), 8 June 2003 (PHL). **DONEGAL: HA 38** - R. Owenveagh, Glenbeagh Cottage, Glenveagh (B990178), 5 August 1983, H. Twomey (DAM): **HA 39** - stagnant drain, L. Swilly, Newtown Cunningham (C311197), 21 June 2000 (Langton, 2002). **DUBLIN: HA 9** - Grecian urn, University College Dublin, Belfield (O184298), April 1984, R. French (CCO); Woodview Pond, University College Dublin (O186203), 4 July 1966 and 27 July 1967 (Murray, 1972). R. Dodder, Clonskeagh Bridge (O174306), 1946 (Grey, 1946). Bog pool, Featherbed (O115217), 26 July 1949 (Reilly, 1951). Bog pool, Kilakee (O125180), 13 December 1949, CFH (DAM). **FERMANAGH: HA 36** - stream, Lisnaskea (H384306), 27 June 2000 (Langton, 2002). **KERRY: HA 22** - R. Annascaul, Annascaul (Q593017), 2 July 1981 (Hayes, 1991).



**KILDARE: HA 9** - Rye Vale Pond, Leixlip (N997366), 3 March 1968 (Murray, 1972).  
**LONGFORD: HA 26** - R. Camlin tributary, Longford Racecourse (N149767), June 1965 (Murray, 1965). **MEATH: HA 7** - R. Boyne, Bellinter Bridge (N894625), 28 August 1981 (DAM). Artificial tank, Ardsallagh, Navan (N896635), 2 April 2000, 8 May 2005 (DAM). R. Blackwater, Carnaross Bridge (N685779), 12 December 1975, and Tatestown (N831715), 30 March 1976 (O’Flaherty, 1976). Tailings pond, Randalstown, Navan (N845714), 10 March 1995 (Finnegan, 1998): **HA 8** - pond, Meadesbrook, Kilmoon, Ashbourne (O040594), 23 April 2012 (DAM). **OFFALY: HA 25** - bog lake 1, Turraun (N172185), June 1998 (DAM). **WESTMEATH:** - Royal Canal, Cullion (N424563) and below fish farm (N431554), May 1990 (Murray, 1990). **WEXFORD: HA 12** - Barkers stream, Bunclody (S881573), 1970 (DAM). **WICKLOW: HA 10** - Glencullen R., Brockey (O169207) and Glencullen Bridge (O195193), 1970 (Clabby and Bracken, 1976).

***Rheopelopia eximia* (Edwards, 1929)**

**CARLOW: HA 12** - R. Slaney, Motabower Bridge (S832778) and Kilcarrig Bridge (S893624), 28 July 1981 (Hayes, 1991). **CORK: HA 20** - R. Ilen, Drimoleague (W098454) and Madore (W103419), 24 August 1983 (Hayes, 1991). R. Ovane, Pierson’s Bridge (W023454), 24 August 1983 (Hayes, 1991). **DONEGAL: HA 38** - R. Owenwee, Derrynacarrow, Doocherry (B880078), 22 August 1984 (Murray, 2005). **KILDARE: HA 9** - R. Liffey, Straffan Bridge (N924293), 15 July 1983 (Hayes, 1991). **MAYO: HA 32** - R. Altahoney, Newport (F950050), 1968-1971 (Fahy and Murray, 1972). **ROSCOMMON: HA 26** - R. Suck, Castlecoote (M809627), 16 July 1981 (Hayes, 1991). **WICKLOW: HA 10** - R. Avonmore, Castlehoward (T190833), 4 August 1983, BPH (Hayes, 1991; Murray, 2005). R. Derry, Bridgeland (T021744), 29 July 1981 (Hayes, 1991). R. Slaney, Knockgarrigan, Glen of Imaal (S936937), 28 July 1981 (Hayes, 1991).

***Rheopelopia maculipennis* (Zetterstedt, 1838)**

**ANTRIM: HA 3** - Kells R., Shank Bridge, Kells (J126982), 20 June 2000 (Langton, 2002).  
**CARLOW: HA 12** - R. Slaney, Kildavin (S899597), 28 July 1981 (Hayes, 1991). R. Derreen, Acann Bridge (S900781), 29 July 1981 (Hayes, 1991). **CAVAN: HA 36** - R. Erne, Kilsarin (N362910), 27 May 1982 (Hayes, 1991). **CLARE: HA 28** - R. Annageeragh, Moyglass Bridge, d/s L. Doo (R078725), 30 July 1982 (Hayes, 1991). **CORK: HA 18** - R. Blackwater, Duncannon (W180931), Shamrock Bridge, Millstreet (W221935), Charles Bridge, Millstreet (W248943) and Keale Bridge, Millstreet (W294936), 2 September 1981 (Hayes, 1991); Ballymacquirk Bridge, Banteer (W382989), Roskeen Bridge, Banteer (W444988) and Lombardstown (W463968), 1 September 1981 (Hayes, 1991); Killavullen (W648998), 31 August 1981 (Hayes, 1991); **HA 20** - R. Bandon, Long Bridge, Dunmanway (W242631), 25 August and 25 September 1980; Bealabouy Bridge, Dunmanway (W257514), 25 August and 25 September 1980; u/s Ballineen (W331537), 30 June, 25 August 1980; Ballineen Bridge (W434538), 27 May and 25 August 1980; Castle Bernard, u/s Bandon (W472546), 27 May, 30 June 1980; 2.5km ds Bandon (W516569), 27 May, 30 June, 25 August 1980 (all Morgan, 1982). **DERRY: HA 3** - R. Bann, Coleraine (C854304), 10 June to 8 August 1999 (PHL); 17 May to 16 July 2000 (PHL); 24 July 2012 (PHL). R. Moyola, New Bridge, Magherafelt (H955905), 4 July 2000 (Langton, 2002). **DONEGAL: HA 37** - R. Eany, d/s Eanybeg confluence (G842815), 10 August 1982 (Hayes, 1991). R. Eanymore, Drumagraa Bridge (G863822), 10 August 1982 (Hayes, 1991); **HA 38** - R. Devlin, Dunlewy (B927190), 19 July 2000 (Langton, 2002). R. Tullaghobeg, Millmount (B933304), 12 August 1982 (Hayes, 1991). R. Owencarrow, Glenveagh (C043235), 18 July 2000 (Langton, 2002); **HA 39** - R. Leannan, Claragh (C197210), 13 August 1982 (Hayes, 1991). R. Crana, Ballymagan (C379344), 15 August 1982 (Hayes, 1991); **HA 40** - R. Keenagh, Hugh Roe's Bridge, Umgall (C454543), 16 August 1982 (Hayes, 1991). **FERMANAGH: HA 35** - Glen R., Garrison (G943522), 29 June 2000 (Langton, 2002). **GALWAY: HA 26** - R. Tirur, Newbridge (M492699), 16 August 1981 (Hayes, 1991); **HA 30** - R. Loughkip, Ballyquirk, Moycullen (M224313), 17 August 1981 (Hayes, 1991); **HA 31** - L.

Ahalia, Maam Cross, north east shore (L971402), 22 April 2009, EPA (DAM). R. Owentouey, Tullywee Bridge, Recess (L873474), 18 August 1981 (Hayes, 1991): **HA 32** - R. Dawros, Tullywee Bridge, Letterfrack (L730586), 18 August 1981 (Hayes, 1991). **KERRY: HA 22** - R. Caragh, d/s Owenroe R. confluence (V720815); Blackstones Bridge, d/s R. Acoose confluence (V710864); outflow from L. Caragh (V713924), 1975 (all Dowling *et al.*, 1981). R. Clydagh, Caherbarnagh (W202842), u/s Clydagh Bridge (W114826), Knocknagowan (W187837) and d/s Clydagh/Loo confluence (W084814), June to August 1978, (Ashe, 1982). R. Flesk, Garries Bridge (W082835), Flesk Bridge (W034876), d/s Whitebridge (V987900), d/s New Bridge (V963885) and u/s L. Leane (V964894), June to August 1978 (Ashe, 1982); White Bridge (V987904), 1973 (Douglas and Murray, 1980). R. Loo, Aughnanus Bridge, Crohane (W045790), June to August 1978 (Ashe, 1982). **KILDARE: HA 9** - R. Liffey, Sallins (N881245), 17 July 1983 (Hayes, 1991). **KILKENNY: HA 15** - R. Nore, Ballyragget (S445707), Norelands Bridge (S547436) and Brownsbarn Bridge (S618391), 28 August 1981 (Hayes, 1991). **LAOIS: R. Nore**, Castletown Bridge (S326930) and Kilbricken (S362898), 27 August 1981 also Athanagh (S423763), 28 August 1981 (Hayes, 1991). **MAYO: HA 32** - R. Owenwee, u/s Aghamore Bridge, Westport (L972817), 5 August 2004, DAM/WM (DAM). R. Erriff, Ashleigh Falls (L895645), 18 August 1981 (Hayes, 1991). Seashore at stream outflow, Killary (L869694), 5 June 2002, DAM/WM (DAM): **HA 33** - R. Owenmore, Bangor Erris (F863228), 18 August 1983 (Hayes, 1991): **HA 34** - R. Moy, Bellanacurra (G403047), Cloongullaun (G348016) and Ballylahan (M227992), 29 August 1982 (Hayes, 1991). **MEATH: HA 7** - R. Boyne, Trim Castle, Trim (N805566), 5 September 1988 (Murray, 1988); Newtown, Trim (N815571), 9 July 1981 (Hayes, 1991); Bellinter Bridge (N894626), 21 August 1988 (Murray, 1988), 11 August 1999, DAM/WM (DAM); Ardsallagh, adjacent to St Bridget's Well (N897635), 7 July 1988 (Murray, 1988); Kilcarn Bridge, Navan (N884657), 21 August 1988 (Murray, 1988); railway bridge, Navan (N874674), 5 July 2006 (DAM); New Bridge, Navan (N873679), 18 August 1988 (Murray, 1988); Stackallen Bridge (N917713), 17 August 1988 (Murray, 1988) and 19 July 1989 (DAM); Slane Bridge (N965737), Knowth Weir (N995720)

and Oldbridge (O045761), 19 July 1989 (DAM). R. Blackwater, Donaghpatrick (N819723), 19 August 1988 and Poolboy Bridge, Navan (N871681), 18 August 1988 (Murray, 1988). **OFFALY: HA 25** - R. Little Brosna, New Bridge (N016088), 2 September 1982 (Hayes, 1991). **ROSCOMMON: HA 26** - R. Suck, Castlecoote (M809627), 16 July 1981; Mount Talbot (M813531), 14 August 1981; Ballyforan (M817464), 16 July 1981; Newtown (M844346), 15 August 1981 (all Hayes, 1991). **SLIGO: HA 34** - R. Moy, Metal Bridge, Tobercurry (G464138), 30 August 1982 (Hayes, 1991); **HA 35** - R. Drumcliff, Glencar (G734430), 19 August 1983 (Hayes, 1991); **HA 35** - R. Easky, Easky (G377378), 19 August 1983 (Hayes, 1991). **TIPPERARY: HA 16** - R. Drish, Boolabeha Bridge (S190619), 6 July 1992 (Murray and Lynch, 1992). R. Drish, Athlummon Bridge (S177593), 6 July 1992 (Murray and Lynch, 1992). R. Suir, d/s Thurles (S128581), 22 May 1992, Cabragh (S124562), 6 July 1992, JL (Murray and Lynch, 1992). **WATERFORD: HA 18** - R. Blackwater, Ballyduff (W964992) and Lismore (X047988), 31 August 1981 (Hayes, 1991). **WEXFORD: HA 12** - R. Slaney, Clomahon (S933534) and Ballycarney (S967488), 29 July 1981 (Hayes, 1991). **WICKLOW: HA 10** - R. Avonmore, Lion Arch Bridge (T194833), 11 July 1997 (Curran, 2001). R. Avoca, Avoca Village (T203802), July 1997 (Curran and Murray, 2010); **HA 12** - R. Slaney, Knickeen, Glen of Imaal (S987948) and Kilmurray (S889856), 28 July 1981, BPH (Hayes, 1991; Murray, 2005).

***Rheopelopia ornata* (Meigen, 1838)**

**CAVAN: HA 36** - R. Erne, Dingin's Bridge (N331948), 27 August 1982 (Hayes, 1991). **DERRY: HA 3** - R. Bann, Coleraine (C854304), 20 May to 7 September 1999, 17 May to 16 July 2000, 16 June 2001, 10 August, 17 August and 24 August 2012 (PHL). R. Moyola, New Bridge, Magherafelt (H955905), 4 July 2000 (Langton, 2002). **DONEGAL: HA 38** - R. Ray, Crocnalaragh (B989272), 12 August 1982 (Hayes, 1991). **KILDARE: HA 9** - R. Liffey, Sallins (N881245), 17 July 1983 and Straffan Bridge (N924293), 15 July 1983 (Hayes, 1991). **MEATH: HA 7** - R. Boyne, Ardsallagh, adjacent to St Bridget's Well (N897635), 8 July 1968,

23 June 1974 (Murray, 2005) and 7 July 1988 (Murray, 1988); Stackallen Bridge (N918713), 12 July 1981 (Hayes, 1991), 17 August 1988 (Murray, 1988) and 19 July 1989 (DAM); Slane Bridge (N965737), 19 July 1989 (DAM). R. Blackwater, Bloomsbury Bridge, Oristown (N793741) and Donaghpatrick (N819723), 19 August 1988 (Murray, 1988). **OFFALY: HA 25** - R. Shannon, Shannon Bridge (M967254), 15 August 1981 (Hayes, 1991). **ROSCOMMON: HA 26** - R. Suck, Castlecoote (M809627), 16 July 1981; Mount Talbot (M813531), 14 August 1981 and Ballyforan (M817464), 16 July 1981 (Hayes, 1991). R. Lung, Lung Old Bridge, Tibohine (M652928), 15 June 1999 (DAM).

*Tanypus (Tanypus) kraatzi* (Kieffer, 1912)

**CORK: HA 19** - L. Allua, Ballingearry (W180652), 20 August 2008, EPA (DAM). **MAYO: HA 32** - L. Knappabeg, Westport (M010803), 24 June 2008, EPA (DAM).

*Tanypus (Tanypus) punctipennis* Meigen, 1818

**KERRY: HA 22** - L. Leane, Killarney, Ross Bay (V945850), 7 July 1973 (Douglas and Murray, 1980). **LEITRIM: HA 26** - L. Rinn, Mohill (N095943), 18 July 2008 and 10 September 2008, EPA (DAM). **MEATH: HA 7** - R. Boyne, opposite inflow of R. Skane, Ardsallagh (N895628), 8 June 1974 (DAM). **OFFALY: HA 25** - bog lake 1, Turraun (N172185), 3 June 1999 (Murray, 2005).

*Tanypus (Tanypus) vilipennis* (Kieffer, 1918)

**CAVAN: HA 7** - L. Mullagh, Mullagh (N680856), 27 June 2005, DAM/WM (DAM): **HA 36** - L. Ardan, Milltown, Belturbet (H354124), 6 June 2007, EPA (DAM). L. Cuillaghan, Ballyconnell (H303183), 6 June 2007, EPA (DAM). **FERMANAGH:** - L. Inver (Inver L.), Rosslea (H518314), 28 June 2000 (Langton, 2002). **GALWAY: HA 25** - L. Derg, Woodford (M794964), 24 May 2003 (PHL). **LIMERICK: HA 24** - Bleach L., Pallaskenry (R441569), 13 June 2009, EPA (DAM). **LOUTH: HA 6** - L. Mentrim, Ardee (N913879), 27 June 2005,

DAM/WM (DAM): **HA 32** - L. Knappabeg, Westport (M010803), 24 June and 23 July 2008, EPA (DAM). **MONAGHAN: HA 6** - L. Naglack, Carrickmacross (H853026), 3 May 2007, EPA (DAM). L. Naglack, Carrickmacross (H853026), 11 June 2007, EPA (DAM): **HA 36** - L. Kilroosky, Clones (H494274), 28 June 2000 (Langton, 2002); Summerhill L., Magheraveely (H490280), 28 June 2000 (Langton, 2002). **ROSCOMMON: HA 26** - L. Glinn, Loughglinn, Castlerea (M629870), 12 June 2008, EPA (DAM). Grange L., Greywood, Strokestown (M938857), 25 June 2008, EPA (DAM). L. Key (wharf at Park), Boyle (G848040), 11 June 2008, EPA (DAM). **WATERFORD: HA 17** - Belle Lake, Dunmore East (S665049), 22 April and 1 September 2009, EPA (DAM). **WESTMEATH: HA 26** - L. Killinure, Ballaghkeernan Bay (N069445), 26 June 2007 and Wineport (N067458), 15 August 2007, EPA (DAM): **HA 36** - L. Bane, Collinstown (N550712), 26 June and 24 July 2006, EPA (EPA).

*Telmatopelopia nemorum* (Goetghebuer, 1921)

**MAYO: HA 32** - R. Altahoney, Srahmore, Newport (F966053), 1 July 1972, EF (Fahy and Murray, 1972; Murray, 2005).

*Thienemannimyia (Hayesomyia) tripunctata* (Goetghebuer, 1922)

**CARLOW: HA 12** - R. Slaney, Kilcarrig Bridge (S893624), 28 July 1981, BPH (Murray, 2005). **CORK: HA 20** - R. Bandon, Bealabouy Bridge, Dunmanway (W257514), 30 June 1980; Castle Bernard (u/s Bandon) (W472546), 30 June 1980 and 25 August 1980; 2.5km d/s Bandon (W516569), 30 June 1980 and 22 August 1981, GM (PJA/DAM). **DOWN: HA 3** - R. Muddock, Muddock Bridge, Rathfriland (J235342), 27 August 1998 (PHL). **MEATH: HA 7** - R. Boyne, Ardsallagh, adjacent to St Bridget's Well (N897635), 2 July 1984 (DAM). **WEXFORD: HA 12** - R. Slaney, Clomahon (S933534), Ballycarney (S967488) and Ederline Bridge (S977345), 29 July 1981 (Hayes, 1991); Scarawalsh Bridge, Marshalstown (S983450), 19 July and 9 August 1984, DAM (Murray and Fittkau, 1985 – Neotype material from 19 July 1984 deposited in Zoologische Staatssammlungen Munich).

***Thienemannimyia (Thienemannimyia) carnea (Fabricius, 1805)***

**DOWN: HA 3** - R. Leitrim, Leitrim Bridge, Hilltown (J217285), 13 August 1998 (PHL).

**MEATH: HA 7** - R. Boyne, Bellinter Bridge (N894625), 23 July 1968 (Murray, 1972).

***Thienemannimyia (Thienemannimyia) festiva (Meigen, 1838)***

**DERRY: HA 3** - L. Neagh, unspecified location (H9080), no date (Tokeshi, 1990).

***Thienemannimyia (Thienemannimyia) fusciceps (Edwards, 1929)***

**DERRY: HA 3** - R. Bann, Coleraine (C854304), 14 July 2013 (Langton, in press), also 19 July and 30 August 2013 (PHL).

***Thienemannimyia (Thienemannimyia) geijskesi (Goetghebuer, 1934)***

**CLARE: HA 27** - L. Bunny, Aughrim, south east shore (R377965), 7 June 2006, EPA (EPA):  
**HA 3** - R. Bann, Coleraine (C854304), 3 May 2000 (PHL). L. Neagh, Ballyronan (H948862),  
27 April 1999 (PHL). **WICKLOW: HA 10** - R. Glencullen, Knocksink (O218180), 17 May  
1987, DEM/DAM (Morgan, 1989; Murray, 2005).

***Thienemannimyia (Thienemannimyia) laeta (Meigen, 1818)***

**GALWAY: HA 30** - R. Loughkip, Ballyquirk, Moycullen (M224313), 16 August 1995, BPH  
(Murray, 2005). **MAYO: HA 32** - R. Burleemslough, Clapper Bridge Ford, Killeen (L754759),  
5 August 2004, DAM/WM (DAM). **MEATH: HA 7** - R. Boyne, Bellinter Bridge (N894625),  
18 August 1968, DAM (Murray, 1972) and 21 August 1988 (Murray, 1988); Kilcarn Bridge,  
Navan (N884657), 21 August 1988 (Murray, 1988); Stackallen Bridge (N917713), 17 August  
1988 (Murray, 1988), 19 July 1989 (DAM); Slane Bridge (N965737) and Oldbridge (O045761),  
19 July 1989 (DAM). R. Blackwater, Bloomsbury Bridge, Oristown (N793741) and  
Donaghpatrick (N819723), 19 August 1988 (Murray, 1988); Poolboy Bridge, Navan  
(N871681), 18 August 1988 (Murray, 1988). **WEXFORD: HA 13** - R. Corrock, Goff's Bridge,

Horetown (S870185), 12 June 2012, DAM/WM (DAM).

***Thienemannimyia (Thienemannimyia) lentiginosa (Fries, 1823)***

**DONEGAL: HA 38** - R. Owenveagh, Glenbeagh Cottage, Glenveagh (B990178), 27 July 1985, LJH (Heneghan, 1986). **DUBLIN: HA 9** - Upper Reservoir, Bohernabreena (O095219), 3 May 1946, CFH (DAM): **HA 22** - L. Leane, Killarney (V931886), 24 June 2008, EPA (DAM). R. Flesk, d/s Clydagh/Loo confluence (W084814), 10 August 1978 (PJA). **MAYO: HA 30** - L. Mask, west shore, Toormakeady (M113702), 24 June 2008, EPA (DAM): **HA 32** - R. Altahoney, Newport (F950050), 1968-1971, EF (Fahy and Murray, 1972). **MEATH: HA 7** - R. Boyne, Kilcarn Bridge, Navan (N884657), 16 October 1994 (DAM) and 16 August 1995 (Murray, 2005). **ROSCOMMON: HA 26** - L. Key, Boyle, Hogs Island Pier (G825054), 9 September 2008, EPA (DAM).

***Thienemannimyia (Thienemannimyia) northumbrica (Edwards, 1929)***

**ANTRIM: HA 3** - L. Neagh, Antrim Bay (J135866), 22 July 2001 and Churchtown Point (J056852), 22 August 2001 (PHL). **CAVAN: HA 26** - L. Sheelin, Gore Point (N439817), July 1982, PG (DAM): **HA 36** - Glasshouse L., Killashandra (H270060), 7 June 2007, EPA (DAM). L. Garty, Arvagh (N278978), 7 June 2007, EPA (DAM). L. Gowna, north basin, Arnagahan (N285920), 7 June 2006, EPA (DAM). **CLARE: HA 25** - L. Graney, Doorus, west shore (R556930), 4 May and 8 June 2006; mid lake (R557924), 11 August 2009, EPA (DAM): **HA 27** - L. Bunny, south east shore, Aughrim (R377965), 5 September 2006, EPA (EPA). L. Cullaun, Corrofin, mid east shore (R317905), 16 June and 22 July 2009, EPA (DAM). L. Muckanagh, Tubber, Corrofin (R370922), 11 June 2009, EPA (DAM). **CORK: HA 21** - L. Glenbeg, Ardgroom (V706530), 3 September 2008, EPA (DAM). **DERRY: HA 3** - R. Bann, Coleraine (C854304), 7 June 2000 (PHL) and 13 June 2000 (PHL). L. Neagh, Ballyronan (H948862), 4 July 2000 (Langton, 2002), 22 August 2001 and 31 May 2011 (PHL). **DONEGAL: HA 36** - L. Tullynasiddagh, Ballyshannon (G983656), 7 July 2009, EPA (DAM). L. Vearty, Ballyshannon



(G995658), 8 July 2009, EPA (DAM): **HA 37** - L. Eske, Donegal (G973844), 14 July 2009, EPA (DAM): **HA 38** - L. Dunglow, west shore, Dunglow, The Rosses (B782119), 5 August 2009, EPA (DAM). L. Anure, east shore, Loughanure (B818162), 17 June 2009, EPA (DAM). L. Veagh, boathouse near Castle, Glenveagh (C022211), 21 July 2009, EPA (DAM); pond, Glenveagh (C023214), 23 June 1986 (Heneghan, 1986). L. Shannagh, Magheradrumman, Fanad Peninsula (C216450), 21 July 2009, EPA (DAM). **GALWAY: HA 29** - L. Rea, east shore, Loughrea (M624153), 25 May 2003 (PHL): **HA 30** - L. Anillaun, Maam Cross (L980470), 8 June and 5 September 2007, EPA (DAM). L. Corrib Upper, Oughterard (M138486), 14 August 2007, and L. Corrib Lower, Moycullen (M271360), 11 June 2007, EPA (DAM): **HA 31** - L. Anaserd, Ballyconneely (L605443), 9 August 2006 and 17 July 2007, EPA (DAM). L. Nahasleam, Maam Cross South (L972440), 8 August 2006, EPA (DAM): **HA 32** - L. Aughrusbeg, Cleggan (coastal) (L557582), 11 September 2007, EPA (DAM). L. Enask, Beaghcauneen (L662468), 17 July 2007, EPA (DAM). **KERRY: HA 21** - L. Currane, Waterville (V535664), 18 June 2008, EPA (DAM): **HA 21** - Erik L., Derrygarriff (V881777), 9 August 2005, JRB (Murray, 2005): **HA 22** - L. Leane, Killarney, Brickeen (V937850) and Castlough Bay, north (V966866), 30 July 1973 (Douglas and Murray, 1980). Muckross Lake, Dundag Bay (V964858), 12 July 1972, DAM (Murray, 1974) and 1973, DJD/DAM (Douglas and Murray, 1980); Muckross Lake, mid lake, Muckross (V950853), 16 July 2008, EPA (DAM). R. Caragh, at L. Caragh outflow (V713924), 1975, CD (Dowling *et al.*, 1981). R. Laune, Ferry Bridge (V891912), 1973 (Douglas and Murray, 1980). **LEITRIM: HA 26** - L. Allen, Mountallen, Drumshanbo (G950145), 28 April 2008, EPA (DAM): **HA 36** - L. Drumlaheen, Feenagh, Ballinamore (H091071), 18 June and 17 July 2007, EPA (DAM). **LONGFORD: HA 26** - L. Ree, Barley Harbour, Yew point (N018485), 13 June 2007 and Coosan (N050450), 15 August 2007, EPA (DAM). **MAYO: HA 30** - L. Carra, Keel Bridge, Ballinrobe (M165680), 19 June 2008, EPA (DAM): **HA 32** - L. Doo, Delphi, north east shore (L834689), 6 June 2002, DAM/WM (DAM); west shore 1, (L835681), 12 July 2006 and west shore 2 (L833680), 25 August 2008, EPA (DAM). R. Altahoney, Newport (F950050), 1968-

1971, EF (Fahy and Murray, 1972). L. Feeagh, Newport (L975983), 24 July 2008, EPA (DAM). L. Ballin, Westport, north shore (L996882), 25 June 2008, EPA (DAM): **HA 33** - Cross L., north east shore, Drumreagh, Belmullet (F651299), 17 June 2008, EPA (DAM). L. Carrowmore, Derreens, Bangor Erris (F833299), 28 July 2008, EPA (DAM): **HA 34** - L. Cullin, Drummon Wood (G235046), 18 June 2008, EPA (DAM). L. Levally, Massbrook (G146043), 25 June 2008, EPA (DAM). **MONAGHAN: HA 36** - L. Avagnon, Latton, Cotehill (H688133), 11 July 2007, EPA (DAM). **ROSCOMMON: HA 26** - L. Annaghmore, Strokestown (M902838), 12 June, 15 July and 2 September 2008, EPA (DAM). L. Cavetown, Boyle (M832974), 11 June 2008, EPA (DAM). L. Key, Boyle (G838057), 6 August 2008, EPA (DAM) and wharf at Forest Park (G848040), 11 June 2008, EPA (DAM). L. Gara, Monastredan (M708996), 5 September 2008, EPA (DAM): **HA 35** - L. Easky, Ox Mountain (G446230), 17 July 2008, EPA (DAM). L. Gill, Sligo (G782350), 11 June and 20 August 2008, EPA (DAM). **WESTMEATH: HA 25** - L. Ennell, Tudenham (N415466), 18 July 1966 (Murray, 1972). **HA 26** - L. Owel, Mullingar (N421566), 9 August 1979, NH (Hayes, 1980). L. Killinure, Wineport (N067458), 26 June 2007, EPA (DAM): **HA 36** - L. Bane, Collinstown (N550712), 22 August 2006, EPA (EPA).

***Thienemannimyia (Thienemannimyia) pseudocarnea* Murray, 1976**

**ANTRIM: HA 3** - L. Neagh, Churchtown Point (J056852), 31 May 2011 (PHL). **CARLOW: HA 12** - R. Slaney, Kilcarr Bridge (S893624), 28 July 1981 (Hayes, 1991). **CLARE: HA 27** - L. Bunny, Aughrim, south east shore (R377965), 4 July 2006, EPA (EPA). **CORK: HA 18** - R. Blackwater, Charles Bridge, Millstreet (W248943), 2 September 1981; Roskeen Bridge, Banteer (W444988), 1 September 1981 and Killavullen (W648998), 31 August 1981 (Hayes, 1991): **HA 20** - R. Bandon, Long Bridge, Dunmanway (W242631), 27 May and 25 August 1980; Bealabouy Bridge, Dunmanway (W257514), 27 May, 30 June and 25 August 1980; u/s Ballineen (W331537), 25 August 1980; Ballineen Bridge (W434538), 27 May, 25 August and 25 September 1980; Castle Bernard (u/s Bandon) (W472546), 27 May, 30 June and 25 August 1980; 2.5km d/s Bandon (W516569), 27 May, 30 June, 25 August and 25 September 1980 (all

Morgan, 1982). **DERRY: HA 3** - R. Bann, Coleraine (C854304): 5 May to 24 July 1999, 17 May to 30 July 2000, 16 June 2001, 27 July, 3 August, 10 August and 24 August 2012 (PHL). L. Neagh, Ballyronan (H948862), 22 May and 31 May 2011 (PHL). **DONEGAL: HA 38** - L. Mulladerg, The Rosses (B775199), 19 July 2000 (Langton, 2002): **HA 39** - L. Gartan, north shore, Church Hill (C065173), 18 July 2000 (Langton, 2002). **FERMANAGH: HA 36** - L. Erne, Lower, Boa Island (H108626), 29 June 2000 (Langton, 2002) and 17 August 2011 (PHL). L. Macnean, Upper, Belcoo (H042403) and L. Macnean, Lower, Belcoo (H085384), 29 June 2000 (Langton, 2002). **GALWAY: HA 32** - R. Dawros, Tullywee Bridge, Letterfrack (L730586), 18 August 1981 (Hayes, 1991). **KERRY: HA 22** - R. Caragh, Blackstones Bridge, d/s R. Acoose confluence (V710864), 1975, CD (Dowling *et al.*, 1981). R. Flesk, d/s Clydagh/Loo confluence (W084814), May to August 1978 (Ashe, 1982); White Bridge (V987904), 1973, DJD/DAM (Douglas and Murray, 1980); d/s Whitebridge (V987900), 12 July 1974 (Murray, 1976b), 27 July 1974 (Murray, 2005) and May to August 1978 (Ashe, 1982); u/s Newbridge (V978900), 30 May 1973 (Douglas and Murray, 1980); New Bridge, Killarney (V968896), 29 August 1987, NOM (LJH); d/s New Bridge (V963885) and u/s L. Leane (V964894), May to August 1978 (Ashe, 1982). **KILDARE: HA 9** - R. Liffey, Sallins (N881245), 17 July 1983 (Hayes, 1991). **KILKENNY: HA 15** - R. Nore, Norelands Bridge (S547436) and Brownsbarn Bridge (S618391), 28 August 1981 (Hayes, 1991). **MAYO: HA 34** - R. Moy, Cloongullaun (G348016), 30 August 1982 and Ballylahan (M227992), 29 August 1982 (Hayes, 1991). **MEATH: HA 7** - R. Boyne, Scarrif Bridge (N733527), 9 July 1981 (Hayes, 1991); Bellinter Bridge (N894626), 21 August 1988 (Murray, 1988); Ardsallagh, adjacent to St Bridget's Well (N897635), 16 June 1974 (DAM); Kilcarn Bridge, Navan (N884657), 21 August 1988 (Murray, 1988); Stackallen Bridge (N917713), 17 August 1988 (Murray, 1988) and 19 July 1989 (DAM); Oldbridge (O045761) and d/s Oldbridge (O062753), 19 July 1989 (DAM). R. Blackwater, Sedenrath Bridge (N762759), 30 March 1976 (O'Flaherty, 1976); Bloomsbury Bridge, Oristown (N793741) and Donaghpatrick (N819723), 19 August 1988 and Poolboy Bridge, Navan (N871681), 18 August 1988 (Murray, 1988). **OFFALY: HA**

**25** - R. Shannon, Shannon Bridge (M967254), 15 August 1981 (Hayes, 1991). **ROSCOMMON: HA 26** - R. Suck, Castlecoote (M809627), 16 July 1981; Athleague (M825758), 14 August 1981 and Ballyforan (M817464), 15 August 1981 (Hayes, 1991). **SLIGO: HA 34** - R. Moy, Metal Bridge, Tobercurry (G464138) and Annagh (G466123), 30 August 1982 (Hayes, 1991). **TYRONE: HA 3** - L. Neagh, Washing Bay, Coalisland (H903662), 30 May 2002 (PHL). **WATERFORD: HA 18** - R. Blackwater, Ballyduff (W964992), 31 August 1981 (Hayes, 1991). **WEXFORD: HA 12** - R. Slaney, Ederline Bridge (S977345), 29 July 1981 (Hayes, 1991).

*Trissopelopia longimana* (Staeger, 1839)

**ANTRIM: HA 4** - R. Glenariff, Cushendall (D215205), 2 July 2000 (Langton, 2002). **CARLOW: HA 14** - R. Burren tributary, Slievebawn, Mount Leinster (S818556), 8 April 2004, JRB (DAM). **CAVAN: HA 26** - R. Owenmore tributary, Cuilcagh Mountains (H099270), 28 April 2004, JRB (DAM). R. Shannon tributary, Cuilcagh Mountains (H074314), 28 April 2004, JRB (DAM). **CLARE: HA 28** - R. Silverhill, east of Milltown Malbay (R096792), 23 April 2004, JRB (DAM). **CORK: HA 18** - R. Araglin tributary, Araglin (R969075), 15 April 2004, JRB (DAM). R. Blackwater, Charles Bridge, Millstreet (W248943) and Keale Bridge, Millstreet (W294936), 2 September 1981 (Hayes, 1991): **HA 19** - Cruppoge stream, Kilcorney (W367851), 16 April 2004, JRB (DAM): **HA 20** - R. Bandon, Long Bridge, Dunmanway (W242631) and Ballineen Bridge (W434538), 25 August 1980 (Morgan, 1982). R. Ilen, Hollybrook (W117363), 24 August 1983 (Hayes, 1991): **HA 21** - L. Glenbeg, Ardgroom (V706530), 3 September 2008, EPA (DAM). **DERRY: HA 2** - fire dam, Binevenagh Forest, Coleraine (C704314), 18 May 2000 (Langton, 2002). Burn at Largantea picnic area, Formoyle, Coleraine (C738287), 9 June 2000 (Langton, 2002). **DONEGAL: HA 1** - R. Deelee, Legland, Raphoe (C136028), 19 July 2000 (Langton, 2002): **HA 36** - R. Glengariff tributary, west of Rossinver (G859501), 28 April 2004, JRB (DAM): **HA 37** - R. Eanymore, Letterbara Bridge (G883825) and Drumagraa Bridge (G863822), 10 August 1982 (Hayes, 1991). R. Stragar,

Killybegs (G730787), 29 July 1984 and 23 August 1984 (DAM): **HA 38** - R. Tullaghobeg, Millmount (B933304), 12 August 1982 (Hayes, 1991). Stream from Misty L., Glenveagh (C015216), June 1989 (Hernan, 1991). Stream, south west L. Veagh, Glenveagh (C003194), September 1989 (Hernan, 1991); stream, north east L. Veagh, 50m above lake, Glenveagh (C030218), June and September 1989 (Hernan, 1991); stream, north east L. Veagh, 250m above lake, Glenveagh (C031217), 15 August 1985 (Heneghan, 1986) and September 1989 (Hernan, 1991); stream, north east L. Veagh, 350m above lake (C031215), June, September and November 1989 (Hernan, 1991); L. Veagh, north east shore, Glenveagh (C039230), 16 August 1985, POD (Heneghan, 1986). R. Ray, Muckish Gap (B993268), 12 August 1982 (Hayes, 1991): **HA 39** - R. Swilly, Newmills, Letterkenny (C125092), 18 July 2000 (Langton, 2002). R. Leannan, Claragh (C197210), 13 August 1982 (Hayes, 1991). R. Crana, Ballymagan (C379344), 15 August 1982 (Hayes, 1991): **HA 40** - R. Keenagh, Hugh Roe's Bridge, Umgall (C454543), 16 August 1982 (Hayes, 1991). **DOWN: HA 3** - Upper Bann, New Bridge, Hilltown (J238288), 29 May 1998 (PHL); Upper Bann, Hilltown Ford, Hilltown (J222289), 27 March 1998 (PHL). R. Shanky, Hilltown (J221243), 18 June and 26 September 1997 (PHL); R. Shanky, Batts Bridge, Hilltown (J226257), 26 September 1997 (PHL). R. Rocky, d/s R. Shanky confluence, Hilltown (J233277), 26 September 1997 (PHL). R. Kinnahalla, Hilltown (J239292), 26 September 1997 (PHL). Glenaveagh stream, Glenaveagh Bridge (J255284), 29 May 1998 (PHL). **DUBLIN: HA 9** - R. Dodder tributary (Slade Brook), Glenasmole (O103205), 8 June 1978, PA (DAM). **FERMANAGH: HA 36** - R. Belbarrinagh, Belcoo (H112309), 29 June 2000 (Langton, 2002). **GALWAY: HA 25** - R. Woodford, Woodford (M732000), 24 May 2003 (PHL): **HA 30** - L. Corrib, no data (M1545), 1980, BC (DAM). Pool and stream at lay-by on road N59, Moycullen (M204336), 25 May 2003 (PHL). R. Aille tributary, Toormakeady (M022683), 7 April and 21 April 2004, JRB (DAM). R. Loughkip, Ballyquirk, Moycullen (M224313), 17 August 1981 (Hayes, 1991): **HA 32** - R. Owenglin, Clifden (L677506), 18 August 1981 (Hayes, 1991). R. Dawros, Tullywee Bridge, Letterfrack (L730586), 18 August 1981 (Hayes, 1991). Pond, CNP, Letterfrack (L715573), 18 September 1996 and R. Polladirik,

CNP, Letterfrack (L741565), 19 September 1986 (Heneghan, 1987). **KERRY: HA 19** - R. Bohill, Ballyvourney (W200811), 16 April 2004, JRB (DAM): **HA 22** - Curraghalia stream, Moll's Gap (V845789), 17 April 2004, JRB (DAM). R. Caragh, Upper Brida Valley (V785810), 1975, CD (Dowling *et al.*, 1981). R. Clydagh, u/s Clydagh Bridge (W114826), May to October 1978 (Ashe, 1982). R. Flesk, d/s Clydagh/Loo confluence (W084814), May to October 1978 (Ashe, 1982); d/s Whitebridge (V987900), May to October 1978 (Ashe, 1982) and 2 August 1983, LJH (DAM); d/s New Bridge (V963885), May to October 1978 and u/s L. Leane (V964894), 20 August 1981 (Ashe, 1982). R. Loo, Aughnanus Bridge, Crohane (W045790), May to October 1978 (Ashe, 1982); stream to R. Loo, d/s Aughnanus Bridge, Crohane (W048790), 10 August 1978 (Ashe, 1982). Stream to R. Gaddagh, tributary of R. Laune, Kealnafula, Knockroe, Beaufort (V809873), 17 April 2004, JRB (DAM). **KILKENNY: HA 15** - R. Nore, Norelands Bridge (S547436), 28 August 1981 (Hayes, 1991). **LAOIS:** - R. Nore, Athanagh (S423763), 28 August 1981 (Hayes, 1991). **LEITRIM: HA 35** - R. Bonet tributary, Manorhamilton (G861447), 22 April 2004, JRB (DAM). **MAYO: HA 31** - R. Tooreenacoona, Gleninagh (L809569), 21 April 2004, JRB (DAM): **HA 32** - L. Doo, Delphi, west shore (L833680), 25 August 2008, EPA (DAM) and north east shore (L834686), 22 September 2008, EPA (DAM). R. Burleemslough, Clapper Bridge ford, Killeen (L754759), 5 August 2004, DAM/WM (DAM). R. Bunowen, d/s Laghta Bridge, Laghta Eighter (L852751), 30 September 2004, DAM/WM (DAM). R. Altahoney, Newport (F950050), 1968-1971, EF (Fahy and Murray, 1972) and 8 July 1975 (DAM). R. Owenwee, u/s Aghamore Bridge, Westport (L972817), 5 August 2004, DAM/WM (DAM). Westport L., Westport Woods Hotel, Westport (L985843), 7 May 2004, DAM/WM (DAM): **HA 33** - R. Owenmore, Bangor Erris (F863228), 18 August 1983 (Hayes, 1991). R. Glenlassra, Belderg (G023407), 19 August 1983 (Hayes, 1991). **MEATH: HA 7** - R. Boyne, Bellinter Bridge (N894625), 18 August 1968 (Murray, 1972); R. Boyne, Ardsallagh, adjacent to St Bridget's Well (N897635), 30 May 1999 (DAM); Oldbridge (O045761), 19 July 1989 (DAM); d/s Oldbridge (O062753), 19 July 1989 (DAM). Tailings pond, Randalstown, Navan (N845714), 2 May 1995 and 29 August 1995 (Finnegan,

1998): **HA 8** - stream-pond area, Meadesbrook, Kilmoon (O038594), 27 July 1968 (Murray, 1972), 5 May and 7 May 2005 (DAM). **ROSCOMMON: HA 26** - R. Frances, Castlerea (M694860), 28 April 2004, JRB (DAM). R. Suck, Castlecoote (M809627), 16 July 1981 (Hayes, 1991). **SLIGO: HA 34** - R. Moy, Carrowheden (G530205), Cloonacool (G493168), Metal Bridge, Tobercurry (G464138) and Annagh (G466123), 30 August 1982 (Hayes, 1991). **TYRONE: HA 1** - Dennet Stream, Essbeg Bridge, Lisnaskee (H384306), 27 June 2000 (Langton, 2002). **WEXFORD: HA 12** - Barkers stream, Bunclody (S881573), 8 April 2004, JRB (DAM). **WICKLOW: HA 10** - Roundwood Reservoir, east shore, Roundwood (O214002), 12 July 1983, HD (DAM). R. Glenealo, Glendalough (T090962) and outflow from Upper Glendalough Lake, Laragh, WMNP (T109964), 16 July 1996, EMcE/DAM (McEntee, 1997). R. Avonbeg, Glenmalure, Drumgoft Bridge (T105905), 4 August 1983 (Hayes, 1991).

*Xenopelopia falcigera* (Kieffer, 1911)

**CAVAN: HA 7** - L. Mullagh, Mullagh (N680856), 16 May 1969 (Murray, 1972). **CLARE: HA 29** - L. Skeardeen, Kilcorkan (R388991), 17 June 2009, EPA (DAM). **DERRY: HA 3** - McFadyen's Garden, Coleraine (C848316), 14 April 2002 (PHL). **LIMERICK: HA 24** - L. Gur, Holycross (R646269), 16 September 2009, EPA (DAM). **MEATH: HA 7** - Headford Pond, Kells (N752763), 5 April 1968 (Murray, 1972). **SLIGO: HA 35** - L. Templehouse, Ballymote (G619182), 9 September 2008, EPA (DAM). **WEXFORD: HA 12** - Movilla stream, Screen (T082311), 6 May 2006, DAM/WM (DAM).

*Xenopelopia nigricans* (Goetghebuer, 1927)

**ANTRIM: Rathlin Island** - exit stream from L. Craigmacagan (D153596), 5 July 2004 (PHL). **CLARE: HA 27** - L. Cullaun, Corrofin, mid east shore (R317905), 14 September 2009, EPA (DAM). **CORK: HA 19** - Carrigdroihid Reservoir, Ashton (W360703), May 1976, EF (Murray, 2005). **DONEGAL: HA 38** - L. Veagh, north east shore, Glenveagh (C039230), June 1988 (DAM). **MEATH: HA 7** - pond, Headford, Kells (N752763), 5 April 1968 (Murray, 1972).

***Zavrelimyia (Zavrelimyia) barbatipes* (Kieffer, 1911)**

**ANTRIM: Rathlin Island** - east lighthouse pool (D156516), 24 July 2000 (Langton, 2002): **HA 5** - Raloo Water, Glenoe, Larne (J394967), 8 May 1999 (PHL). **CAVAN: HA 36** - R. Erne, Carrigan (N391935), 27 August 1982 and Drumbarry (N462951), 17 August 1982 (Hayes, 1991). **DERRY: HA 1** - Lower Reservoir, Creggan, Derry (C422174), 10 May 2001 (PHL): **HA 2** - fire dam, Binevenagh Forest, Coleraine (C704314), 18 May 2000 (Langton, 2002). **DONEGAL: HA 1** - R. Dee, Legland, Raphoe (C136028), 19 July 2000 (Langton, 2002): **HA 37** - R. Stragar, Killybegs (G730787), 23 August 1984, **DAM (DAM): HA 38** - L. Nacung, Upper, Dunlewy (B904191), 19 July 2000 (Langton, 2002). R. Devlin, Dunlewy (B927190), 19 July 2000 (Langton, 2002). L. Veagh, north east shore, Glenveagh (C039230), 28 June 1988 (DAM). Bog pool, Glenveagh (C040203), 20 May and 28 June 1988 (Heneghan, 1986). L. Nadourcan, Glenveagh (C054228), 18 July 2000 (Langton, 2002): **HA 40** - R. Keenagh, Hugh Roe's Bridge, Umgall (C454543), 16 August 1982 (Hayes, 1991). **FERMANAGH: HA 36** - R. Belbarrinagh, Belcoo (H112309), 29 June 2000 (Langton, 2002). **GALWAY: HA 30** - R. Loughkip, Ballyquirk, Moycullen (M224313), 17 August 1981 (Hayes, 1991). **KERRY: HA 22** - R. Annascaul, Annascaul (Q593017), 2 July 1981 (Hayes, 1991). R. Caragh, outflow from L. Caragh (V713924), 1975, CD (Dowling *et al.*, 1981). R. Clydagh, u/s Clydagh Bridge (W114826), June to October 1978 (Ashe, 1982). R. Flesk, d/s Clydagh/Loo confluence (W084814) and u/s L. Leane (V964894), June to October 1978 (Ashe, 1982). R. Loo, Aughnanus Bridge, Crohane (W045790), June to October 1978 (Ashe, 1982). **KILKENNY: HA 15** - R. Nore, Norelands Bridge (S547436), 28 August 1981 (Hayes, 1991). **MAYO: HA 32** - R. Owenwee, u/s Aghamore Bridge, Westport (L972817), 8 May 2003, DAM/WM (DAM). Coastal, Carrickvegraly Point, Roonagh (L743806), 27 April 2000, DAM/WM (Murray and Murray, 2003). South of Roonagh Pier, Roonagh (L744808), 27 July 2000, DAM/WM (DAM): **HA 33** - stream, Keem, Achill Island (F561045), 5 August 2004, DAM/WM (DAM). R. Glenlgassra, Belderg (G023407), 19 August 1983 (Hayes, 1991): **Clare Island** - bog pool west of road, Maum (L709863), 5 June 2002 (Murray and Murray, 2003). **MEATH: HA 8** -



Meadesbrook, Kilmoon (O040594), 30 May 1974 (DAM); stream - pond, Meadesbrook, Kilmoon (O038594), 15 June 1985, 25 September and 13 November 1994 (DAM). **SLIGO: HA 34** - R. Moy, Carrownedden (G530205), Cloonacool (G493168) and Metal Bridge, Tobercurry (G464138), 30 August 1982 (Hayes, 1991).

*Zavreliomyia (Zavreliomyia) hirtimana* (Kieffer, 1918)

**GALWAY: HA 30** - L. Lettercraffroe, Oughterard (M056376), 5 September 2007, EPA (DAM). **KERRY: HA 22** - L. Leane, Killarney, Juniper Bay (V949863), 11 June 1973 (Douglas and Murray, 1980). R. Flesk, d/s Whitebridge (V987900), 20 June 1978, PJA (Murray, 2005). **KILKENNY: HA 15** - R. Clogh, Clogh (S565790), 10 March 1976, CD (DAM). **MEATH: HA 7** - R. Boyne, Bellinter Bridge (N894625), 23 May 1968 (Murray, 1972). Ardsallagh, adjacent to St Bridget's Well (N897635), 16 June 1974 (DAM) and 18 October 1981 (Murray, 1988); Ardsallagh, Magazine weir (N894640), 16 October 1994 and 22 April 2005 (Murray, 2005). Tailings pond, Randalstown, Navan (N845714), 2 May 1995 (Finnegan, 1998). **TIPPERARY: HA 16** - R. Drish, Castletown (S207634), 6 July 1992, DAM/JL (Murray and Lynch, 1992).

*Zavreliomyia (Zavreliomyia) melanura* (Meigen, 1804)

**ANTRIM: Rathlin Island** - east of lighthouse pool 2 (D164520), 24 July 2000 (Langton, 2002). **CAVAN: HA 7** - L. Cuilcagh, Virginia (N636895), 30 April 1968 (Murray, 1972). **CORK: HA 19** - L. Aderry, Castlemartyr (W935730), 27 August 1969, NH (Bracken and Murray, 1973). **DONEGAL: HA 37** - R. Stragar, Killybegs (G730787), 23 August 1984, DAM (DAM): **HA 38** - stream, north east L. Veagh, 250m above lake, Glenveagh (C031217), 15 August 1985 (Heneghan, 1986). **FERMANAGH: HA 36** - R. Colebrook, Tattenbuddagh Bridge, Brookeborough (H458428), 4 June 1997 (PHL). **MAYO: HA 32** - Ellis Wood, CNP, Letterfrack (L710573), 17 September 1986 (Heneghan, 1987). L. Nahaltora, Cregganbaun (L794745), 30 September 2004, DAM/WM (DAM): **HA 34** - L. Levally, Massbrook

(G146043), 23 September 2008, EPA (DAM). **SLIGO:** - R. Moy, Metal Bridge, Tobercurry (G464138), 30 August 1982 (Hayes, 1991).

***Zavreliomyia (Zavreliomyia) nubila (Meigen, 1830)***

**MEATH: HA 7** - artificial tank, Ardsallagh (N896635), 31 March 2000 (DAM); artificial tank, Ardsallagh, Navan (N896635), 20 May 1986 (DAM): **HA 8** - Meadesbrook, Kilmoon (O040594), 29 September 1997, 5 April 1999, 31 March and 8 April 2000 (DAM); Meadesbrook pond, Kilmoon (O038594), 23 July 1968 (Murray, 1972).

**SUBFAMILY TELMATOGETONINAE**

***Telmatogeton japonicus Tokunaga, 1933***

**CLARE: HA 27** - seashore, Diamond Rock, Kilkee (Q868600), 26 July 1999, DAM/WM (Murray, 2000).

***Thalassomyia frauenfeldi Schiner, 1856***

**CLARE: HA 27** - seashore, Diamond Rock, Kilkee (Q868600), 26 July 1999, DAM/WM (Murray, 2000). **CORK: Blasket Island** - Inishtearaght (V198950), 10 May 1975, G. Walton (Murray and Ashe, 1982). **MAYO: Clare Island** - coastal marine pool, Bayview Hotel seafront (L717857), 29 April 2000 (Murray and Murray, 2003).

**SUBFAMILY DIAMESINAE**

***Diamesa bohemani Goetghebuer, 1932***

**DOWN: HA 3** - Upper R. Bann tributary, Dooghary (J137443), 29 September 1997 (PHL) and 3 February 2000, LMCL (PHL).

***Diamesa cinerella Meigen, 1835***

**MAYO: HA 32** - R. Altahoney, Newport (F950050), 1968-1971, EF (Fahy and Murray, 1972).

***Diamesa incallida* (Walker, 1856)**

**DUBLIN: HA 9** - R. Dodder, Firhouse (O104274), 18 June 1968 (Murray, 1972). **MEATH: HA 7** - R. Blackwater, Clavens Bridge, Kells (N715775), 31 October 1967 (Murray, 1972). **TIPPERARY: HA 16** - R. Drish, Castletown (S217635), 6 July 1992 (Murray and Lynch, 1992).

***Diamesa insignipes* Kieffer, 1908**

**ANTRIM: HA 3** - L. Neagh, Antrim Bay (J135866), 28 March 2001 (PHL). R. Sixmilewater, Templepatrick (J227867), 4 May 1999 (PHL). **DERRY: HA 1** - inflow to Upper Reservoir, Creggan, Derry (C413171), 23 March 2001 (PHL) and 26 June 2001, LMcL (PHL). **DOWN: HA 3** - Upper Bann, Poland's Bridge, Banbridge (J193428), 26 March 1998 (PHL). R. Kinnahalla, Hilltown (J239292), 25 May 1998 (PHL). **DUBLIN: HA 9** - R. Dodder, Pussy's Leap, Templeogue (O126281) and Firhouse (O104274), 8 February 1968 (Murray, 1972): **HA 9** - bog pool, Featherbed (O120190), 1974, CD (Dowling and Murray, 1981). **KERRY: HA 22** - R. Annascaul, Annascaul (Q593017), 2 July 1981 (Hayes, 1991). **MAYO: Clare Island** - roadside at Bayview Hotel (L716856), 28 April 2000 (Murray and Murray, 2003): **HA 32** - R. Altahoney, Newport (F950050), 1968-1971, EF (Fahy and Murray, 1972): **HA 33** - bog pools, Glenamoy (F896345), 1973, CD (Dowling and Murray, 1981). **MEATH: HA 7** - R. Kinnegad, Kinnegad (N601448), 4 April 1989, M. O'Grady (Murray and Lynch, 1991).

***Diamesa permacra* (Walker, 1856)**

**DUBLIN: HA 9** - bog pool, Featherbed (O120190), May 1950, CFH (in BMNH, London). **KERRY: HA 22** - R. Clydagh, Caherbarnagh (W202842), 12 November 1978 (Ashe, 1982).

***Diamesa tonsa* (Haliday, 1856)**

**ANTRIM: HA 3** - R. Sixmilewater, Templepatrick (J227867), 4 May 1999 (PHL). Glen Burn,

Lower Glen Bridge (J263994), 4 May 1999 (PHL): **HA 5** - Raloo Water, tributary of R. Glenoe, Glenoe, Larne (J394967), 8 May 1999 (PHL). **DERRY: HA 1** - inflow to Upper Reservoir, Creggan, Derry (C413171), 10 May and 26 June 2001 (PHL): **HA 2** - tributary of R. Ballykelly, Siskatree Bridge, Clagan (C628209) and R. Ballykelly, Ballykelly (C623211), 9 June 2000 (Langton, 2002). R. Owenbeg, Feeny picnic area, Feeny (C645058), 26 June 2000. R. Bessbrook, Limavady (C655212); R. Roe, Deerpark Wood, Limavaddy (C682203); R. Curly, Artikelly Bridge, Limavady (C684247); Castle R., Ardmore Bridge, Limavady (C706207) and burn at Largantea picnic area, Formoyle, Coleraine (C738287), 9 June 2000 (all Langton, 2002): **HA 3** - Balinrees Reservoir, Coleraine (C794300), 9 June 2000 (Langton, 2002). R. Agivey, Garvagh (C838154), 30 May 2002 (PHL). R. Macosquin, Black Bridge, Ballylintagh (C854256), 26 May 2000 (Langton, 2002). R. Bann, Coleraine (C854304), 30 May 2002 (PHL). R. Agivey, Glascort Bridge (C907226), 26 May 2000 (Langton, 2002). **DOWN:** Upper Bann tributary, Hilltown (J210294), 27 March 1998 (PHL). Mourne Mountain [Type locality] (J1040), 20 February 1852, AHH (Walker, 1856). R. Carcullion, Hilltown (J213275), 18 June 1997 (PHL). R. Shanky, Batts Bridge, Hilltown (J226257), 29 May 1998 (PHL). **DUBLIN: HA 9** - R. Dodder, above Bohernabreena reservoir (O109202), 14 May 1946 (Fitzgerald, 1947) and 26 October 1946 (CFH/DAM); Fort Bridge, Bohernabreena (O009242), 15 June 1968 (Murray, 1972); Firhouse [Type locality] (O1027), 1855? AHH (Haliday in Walker, 1856). Upper Bohernabreena Reservoir (O095219), April 1947, CFH (Murray, 2005). **FERMANAGH: HA 36** - R. Colebrook tributary, Tullyweel, Fivemiletown (H416474), 23 April 1998 (PHL). **LONGFORD: HA 26** - R. Camlin, Mullagh Bridge, d/s Longford (N116760), 4 May 1965 (Murray, 1972). **TYRONE: HA 1** - Dennet Stream, Essbeg Bridge, Lisnaskee (H509978), 26 June 2000 (Langton, 2002). **WICKLOW: HA 10** - R. Glencullen, Brockey (O169207), Glencullen Bridge (O192194), Knocksink (O217182) and Enniskerry Bridge (O227173), 1970, KC (all Clabby and Bracken, 1976); R. Glencullen, Knocksink (O218180), 18 May 1987, DEM/DAM (Morgan, 1989): **HA 12** - R. Slaney, Knickeen, Glen of Imaal (S987948), 28 July 1981 (Hayes, 1991).

***Potthastia gaedii* (Meigen, 1838)**

**ANTRIM: HA 3** - L. Neagh, Lennymore Bay (J115745), March 1969 (Marks and Henderson, 1970); Churchtown Point (J056852), 13 October 2000 (Langton, 2002). R. Kells, Shank Bridge, Kells (J126982), 20 June 2000 (Langton, 2002): **HA 4** - R. Brymore (Brymore Water), Brymore Bridge (D162275), 2 July 2000 (Langton, 2002). **CARLOW: HA 12** - R. Slaney, Motabower Bridge (S832778), Kilcarry Bridge (S893624) and Kildavin (S899597), 28 July 1981 (Hayes, 1991). **CLARE: HA 25** - Bleach R., Corlea Bridge (R605965), 3 September 1973 (Murray, 2005). L. Graney, Doorus, west shore (R556930), 4 May 2006, EPA (DAM); L. Graney, Drumandora, west shore (R553938), 15 June 2009, EPA (DAM). L. Derg, Mountshannon, west shore (R718861) and d/s Killaloe (M705715), 18 September 2009, EPA (DAM): **HA 28** - L. Doo, Milltown Malbay, north west shore (R113722), 11 June 2009 and 15 September 2009, EPA (DAM); mid lake (R123721), 8 July 2009, EPA (DAM). R. Caher, Murrogh, 5km from source (M153089), 27 October 1999, CB (Kelly-Quinn *et al.*, 2003). **CORK: HA 18** - R. Blackwater, Knocknagree (W159975), Duncannon (W180931), Shamrock Bridge, Millstreet (W221935), Charles Bridge, Millstreet (W248943) and Keale Bridge, Millstreet (W294936), 2 September 1981 (all Hayes, 1991). R. Blackwater, Roskeen Bridge, Banteer (W444988) and Lombardstown (W463968), 1 September 1981 and R. Blackwater, Killavullen (W648998), 31 August 1981 (all Hayes, 1991): **HA 20** - L. Curraghally, Drinagh, Dunmanway (W234046), 9 April 2008, EPA (DAM). R. Bandon, 2.5km d/s Bandon (W516569), 18 April, 27 May, 30 June and 25 September 1980 (all Morgan, 1982). R. Ilen, Madore (W103419) and Hollybrook (W117363), 24 August 1983 (Hayes, 1991). **DERRY: HA 2** - burn at Largantea picnic area, Formoyle, Coleraine (C738287), 9 June 2000 (Langton, 2002): **HA 3** - R. Agivey, Garvagh (C838154), 30 May 2002 (PHL). L. Neagh, unspecified (H9080), no date (McLarnon and Carter, 2000); L. Neagh, Ballyronan (H948862), 10 May 2000 (Langton, 2002). **DONEGAL: HA 37** - L. Eske, Donegal (G973844), 17 April 2009, EPA (DAM). R. Corabber, Greenan Bridge, Ardnamona (G976863), 22 August 1984 (DAM). R. Eany, d/s Eanybeg confluence (G842815), 10 August 1982 (Hayes, 1991). R. Oily, Claggen (G751803), 8 August 1982

(Hayes, 1991). R. Stragar, Duninkeely (G727792), 10 August 1982 (Hayes, 1991): **HA 38** - L. Dunglow, west shore, Dunglow, The Rosses (B782119), 17 June 2009, EPA (DAM). R. Gweedore, outflow from L. Anure, Crolly (B827184), 19 July 2000 (Langton, 2002). R. Tullaghobeg, Falcarragh (B925319) and Millmount (B933304), 12 August 1982 (Hayes, 1991). R. Devlin, Dunlewy (B927190), 19 July 2000 (Langton, 2002). R. Owenveagh, u/s lake, Glenveagh (C000187), April 1989 and June 1989 (Hernan, 1991). L. Veagh, boathouse near Castle, Glenveagh (C022211), 2 June 2009, EPA (DAM). Glenveagh stream, inflow to north east shore of L. Veagh, 50m above lake (C030218), June 1989; 250m above lake (C031217), September 1989 and November 1989; 350m above lake (C031215), September 1989 (all Hernan, 1991). Owennacally stream, Glenveagh (C043226), 19 July 2000 (Langton, 2002). R. Owencarrow, d/s road bridge, Glenveagh (C043235), 18 July 2000 (Langton, 2002). R. Ray, Crocnalaragh (B989272), 12 August 1982 (Hayes, 1991). L. Glen, Glen (C105292), 29 July 2009, EPA (DAM): **HA 39** - R. Swilly, Newmills, Letterkenny (C125092), 18 July 2000 (Langton, 2002). R. Leannan, Drumaboden (C165218), 12 August 1982 and Claragh (C197210), 13 August 1982 (Hayes, 1991). L. Fern, Millford (C180233), 23 July 2009, EPA (DAM). R. Crana, Ballymagan (C379344), 15 August 1982 (Hayes, 1991): **HA 40** - R. Keenagh, Hugh Roe's Bridge, Umgall (C454543), 16 August 1982 (Hayes, 1991). **DOWN: HA 3** - Upper R. Bann, Newbridge, Hilltown (J238288), 29 May 1998 (PHL). R. Shanky, left fork at Hilltown (J221243), 26 September 1997 and Batts Bridge, Hilltown (J226257), 4 September 1998 (PHL). R. Rocky, d/s Shanky confluence, Hilltown (J233277), 26 September 1997 and 4 September 1998 (PHL) and at Hilltown (J242268), 26 September 1997 (PHL). Glenaveagh stream, Glenaveagh Bridge (J255284), 26 September 1997 and 29 May 1998 (PHL). **DUBLIN: HA 9** - R. Dodder, Fort Bridge, Bohernabreena (O009242), 3 May 1946, CFH (CFH/DAM). **FERMANAGH: HA 35** - L. Melvin, Garrison (G938518), 29 June 2000 (Langton, 2002): **HA 36** - L. Erne, Lower, Boa Island (H108626), 29 June 2000 (Langton, 2002); L. Erne, Lower, Black Bay (H072639), 27 April 2002 (PHL). R. Sruh Croppa, Cuilcagh Mountains (H111329), 29 June 2000 (Langton, 2002). **GALWAY: HA 25** - L. Derg, Woodford (M794964), 24 May

2003 (PHL). R. Woodford, Woodford (M732000), 24 May 2003 (PHL): **HA 26** - R. Shiven, d/s Ballinaglass (M788494), 29 July 1981 (Hayes, 1991). R. Tirur, Newbridge (M492699), 16 August 1981 (Hayes, 1991): **HA 30** - R. Loughkip, Ballyquirk, Moycullen (M224313), 17 August 1981 (Hayes, 1991). R. Owenriff, Oughterard (M112426), 25 May 2003 (PHL). L. Adrehid, Oughterard (M055428), 25 May 2003 (PHL): **HA 31** - L. Ahalia, Maam Cross, north east shore (L971402), 22 April and 18 June 2009, EPA (DAM). L. Ballynahinch, Ballynahinch (L777478), 6 June 2007, EPA (DAM). L. Derryclare, Recess (L825485), 17 April 2007, EPA (DAM): **HA 32** - R. Owenglin, Clifden (L677506), 18 August 1981 (Hayes, 1991). R. Dawros, Tullywee Bridge, Letterfrack (L730586), 18 August 1981 (Hayes, 1991). Mountain stream, Diamond Hill, Letterfrack (L718564), 18 September 1986 and R. Polladirik, Letterfrack (L741565), 19 September 1986 (Heneghan, 1987). L. Kylemore, Letterfrack (L771582), 30 July 2007, EPA (DAM). **KERRY: HA 18** - R. Blackwater, Lacknastooka (R153008), 2 September 1981 (Hayes, 1991): **HA 21** - L. Brin, Derreeny (V780775), 10 September 2008, EPA (DAM): **HA 22** - L. Caragh, Killorglin (V719904), 20 June and 15 July 2008, EPA (DAM). L. Guitane, Crohane, Killarney (W025846), 9 September 2008, EPA (DAM). L. Leane, Killarney, Glena Bay (V930858), 27 July 1973 (Douglas and Murray, 1980). Killarney (V931886), 22 April, 24 June and 18 September 2008, EPA (DAM). Muckcross Lake, Killarney, mid lake (V950850), June 1973, Dundag Bay (V964858), 23 July 1973 (Douglas and Murray, 1980). R. Annascaul, Annascaul (Q593017), 2 July 1981 (Hayes, 1991). R. Caragh, upper Brida Valley (V785810), lower Brida Valley (V740805), d/s Owenroe R. confluence (V720815), Blackstones Bridge, d/s R. Acoose confluence (V710864) and outflow from L. Caragh (V713924), 1975, CD (all Dowling *et al.*, 1981). R. Flesk, d/s Clydagh/Loo confluence (W084814), May to October 1978 (Ashe, 1982); Garries Bridge (W082835) and Flesk Bridge (W034876), May to October 1978 (Ashe, 1982); d/s Whitebridge (V987900), April to July 1978 (Ashe, 1982); u/s Newbridge (V978900), 30 May 1973 (Douglas and Murray, 1980); d/s New Bridge (V963885), 27 April and 6 July 1979 also 14 August 1981 (Ashe, 1982); u/s L. Leane (V964894), May to October 1978 (Ashe, 1982). R. Laune, Beaufort Bridge (V880920), 1973 (Douglas and Murray, 1980).

R. Loo, Aughnanus Bridge, Crohane (W045790), May to October 1978 (Ashe, 1982). Upper Lake, Killarney, west basin (V909821), 1973 (Douglas and Murray, 1980). **KILDARE: HA 7** - R. Boyne, Edenderry (N636346), 9 July 1981 (Hayes, 1991): **HA 9** - R. Liffey, Sallins (N881245), 17 July 1983 (Hayes, 1991). **KILKENNY: HA 15** - R. Nore, Norelands Bridge (S547436) and Brownsbarn Bridge (S618391), 28 August 1981 (Hayes, 1991). **LAOIS:** R. Nore, Castletown Bridge (S326930), Kilbricken (S362898) and u/s Durrow (S416787), 27 August 1981 (Hayes, 1991). **LEITRIM: HA 26** - L. Boderg, Derrycarne, north west shore (N013915), 14 May and 29 July 2008, EPA (DAM). **LIMERICK: HA 25** - R. Mulkear, Cappamore (R775514), 8 September 1981 (Hayes, 1991). **MAYO: HA 30** - L. Mask, Toormakeady, west shore (M097647), 14 April 2008, EPA (DAM): **HA 32** - R. Carrowinsky, Killeen, Carrowinsky (L770773), R. Burleemslough, Clapper Bridge Ford, Killeen, Cloonlaur (L754759) and R. Bunowen, Louisburg (L807807), 5 August 2004, DAM/WM (DAM). L. Fin, Delphi (L841657), 5 April, 9 May and 12 July 2006, EPA (DAM). R. Altahoney, Newport (F950050), 1968-1971, EF (Fahy and Murray, 1972) and July 1975 (DAM). L. Feeagh, Newport (L975983), 25 June, 24 July and 17 September 2008, EPA (DAM). R. Owenwee, Belclare Bridge, Westport (L959822), 7 May 2004, DAM/WM (DAM). R. Erriff, Ashleigh Falls (L895645), 18 August 1981 (Hayes, 1991). Westport L., Westport Woods Hotel, Westport (L985843), 7 May 2004, DAM/WM (DAM). R. Owenduff, bridge south of Killary on road N59 (L810595), 9 May 2003, DAM/WM (DAM): **HA 33** - Sraheens Bridge, Achill Island (L718983), 6 May 2004, DAM/WM (DAM). R. Owenmore, Bangor Erris (F863228), 18 August 1983 (Hayes, 1991). R. Glenlassra, Belderg (G023407), 19 August 1983 (Hayes, 1991): **HA 34** - L. Levally, Massbrook (G146043), 23 September 2008, EPA (DAM). R. Moy, Ballylahan (M227992) and Bellanacurra (G403047), 29 August 1982 also Cloongullaun (G348016), 30 August 1982 (Hayes, 1991): **Clare Island** - no location data (L6885), 1911, PHG (Grimshaw, 1912). **MEATH: HA 7** - R. Kinnegad, Kinnegad (N601448), June 1989 (Murray and Lynch, 1991). R. Boyne, Bellinter Bridge (N894625), 26 May 1968 (Murray, 1972) and 11 August 1999, DAM/WM (DAM); Ardsallagh, at St Bridget's Well (N897635), 16



June 1985 (DAM) and 7 July 1988 (Murray, 1988); railway bridge, Navan (N874674), 5 July 2006 (DAM); New Bridge, Navan (N873679), 18 August 1988 (Murray, 1988); Stackallen Bridge (N918713), 12 July 1981 (Hayes, 1991) and 19 July 1989 (DAM); Slane Bridge (N965737) and d/s Oldbridge (O062753), 19 July 1989 (DAM). R. Blackwater, Clavens Bridge, Kells (N715775), 31 October 1967 (Murray, 1972); Bloomsbury Bridge, Oristown (N793741) and Donaghpatrick (N819723), 19 August 1988 (Murray, 1988). Yellow R., tributary to R. Blackwater, Randalstown, Navan (N835710), 22 June 1995 (Finnegan, 1998): **HA 8** - R. Nanny, road bridge u/s Duleek (O035655) and at Duleek (O050683), 6 June 2006, DAM/WM (DAM). **OFFALY: HA 25** - R. Little Brosna, bridge at Ryan's Cross (S053882), Milltown Park (S068907), Brosna Bridge (S077938), Sharavogue (S056953) and New Bridge (N016088), 2 September 1982 (all Hayes, 1991). R. Brosna, Cloghan (M046209), 2 September 1982 (Hayes, 1991). **ROSCOMMON: HA 26** - R. Suck, Castlecoote (M809627) and Ballyforan (M817464), 16 July 1981; Mount Talbot (M813531), 14 August 1981 (all Hayes, 1991). L. Key, wharf at Forest Park, Boyle (G848040), 11 June 2008, EPA (DAM). L. Ree, Yew Point, Barley Harbour (N018485), 25 April, 13 June 2007, EPA (DAM). **SLIGO: HA 34** - R. Moy, Carrownedden (G530205), 30 August 1982 (Hayes, 1991); R. Moy, Cloonacool (G493168), Metal Bridge, Tobercurry (G464138) and Annagh (G466123), 30 August 1982 (Hayes, 1991): **HA 35** - R. Drumcliff, Glencar (G734430), 19 August 1983 (Hayes, 1991). R. Easky, Easky (G377378), 19 August 1983 (Hayes, 1991). **TIPPERARY: HA 16** - R. Suir, Rossestown Bridge (S134624), 6 July 1992 (Murray and Lynch, 1992): **HA 25** - L. Derg, Terryglass (M861008), 20 April 2009 and Dromineer (M809858), 17 June 2009, EPA (DAM). **TYRONE: HA 1** - Dennet Stream, Essbeg Bridge, Lisnaskee (H509978), 26 June 2000 (Langton, 2002). R. Glenelly, Crannagh Bridge, Crannagh (H594926), 17 August 2011 and Leaghs Bridge, Mullaghallsallagh (H695940), 17 August 2011 (PHL). **WATERFORD: HA 18** - R. Blackwater, Ballyduff (W964992) and Lismore (X047988), 31 August 1981 (Hayes, 1991). **WESTMEATH: HA 26** - L. Killinure, Ballaghkeernan Bay (N069445), 24 April 2007, EPA (DAM). L. Ree, Coosan (N050450), 15 August 2007, EPA (DAM). **WEXFORD: HA 12** - R. Boro, Dunamore Bridge, Enniscorthy

(S963366), 29 July 1981 (Hayes, 1991). R. Slaney, Clomahon (S933534), Ballycarney (S967488) and Edernline Bridge (S977345), 29 July 1981 (Hayes, 1991). R. Sow tributary, Garylough Mill, Screen (T076302), 6 May 2006, DAM/WM (DAM). **WICKLOW: HA 10** - R. Glencullen tributary (O160212), 1970, KC (Clabby and Bracken, 1976); R. Glencullen, Brockey (O169207), u/s Glencullen Bridge (O190195), Glencullen Bridge (O192194) and Enniskerry Bridge (O227173), 1970, KC (Clabby and Bracken, 1976); R. Glencullen, Knocksink (O218180), 18 May 1987 (Morgan, 1989). Outflow from Upper Glendalough Lake, Laragh, WMNP (T109964), 16 July 1996, EMcE/DAM (McEntee, 1997). R. Avonmor, Laragh Bridge (T144965), 24 June 1996, MKQ (DAM). R. Avoca, Whitebridge, Tigroney (T198821), 11 July 1997, FC/DAM (Curran and Murray, 2001) and 27 October 1997 (Curran, 2001): **HA 12** - R. Slaney, Knickeen, Glen of Imaal (S987948), Knockgarrigan, Glen of Imaal (S936937), Stratford Bridge (S895930) and Kilmurray (S889856), 28 July 1981 (Hayes, 1991).

***Potthastia longimanus* Kieffer, 1922**

**ANTRIM: HA 3** - L. Neagh, Antrim Bay (J135866), 4 May 1999 and 22 August 2001 (PHL); Churchtown Point (J056852), 13 October 2000, 22 August 2001 and 31 May 2011 (PHL). Kells R., Shank Bridge, Kells (J126982), 20 June 2000 (Langton, 2002). R. Sixmilewater, Templepatrick (J227867), 4 May 1999 (PHL). Killylane Reservoir, Magherabane, Larne (J292985), 8 May 1999 (PHL): **HA 4** - R. Brymore, Brymore Bridge (D162275), 2 July 2000 (Langton, 2002). R. Glendun, Drumfresky, Cushendun (D193308), 2 July 2000 (Langton, 2002). R. Glenariff (Inver/Glenariff), Cushendall (D215205), 2 July 2000 (Langton, 2002). **CARLOW: HA 12** - R. Slaney, Motabower Bridge (S832778) and Kilcarray Bridge (S893624), 28 July 1981 (Hayes, 1991). R. Derreen, Acann Bridge (S900781), 29 July 1981 (Hayes, 1991). **CAVAN: HA 7** - L. Ramor, Virginia (N603871), May 1971 (Douglas, 1971). R. Barora tributary, Relaghbeg (N679907), 5 April 1968 (Murray, 1972). **CLARE: HA 25** - L. Graney, Caher, south shore (R568907), 24 May 2003 (PHL); Doorus, west shore (R556930), 10 April and 4 May 2006, Drumandora, west shore (R553938), 15 June 2009, EPA (DAM) and

Flagmount, east shore (R563932), 16 September 2009, EPA (DAM). L. Alewnaghta, Whitegate, west shore (R758908), 16 July 2009, EPA (DAM): **HA 28** - L. Doo, Milltown Malbay, north west shore (R114722), 15 September 2009, EPA (DAM). **CORK: HA 18** - R. Blackwater, Killavullen (W648998), 31 August 1981 (Hayes, 1991): **HA 19** - L. Gouganebarra, Inchegeelagh (W009060), 6 April and 18 June 1966 (Murray, 1972): **HA 20** - R. Bandon, 2.5km d/s Bandon (W516569), April to November 1980 (Morgan, 1982). R. Ilen, Drimoleague (W098454) and Madore (W103419), 24 August 1983 (Hayes, 1991). **DERRY: HA 2** - R. Roe, Deerpark Wood, Limavaddy (C682203), 9 June 2000 and Largy Bridge, Limavaddy (C681202), 14 July 2000 (Langton, 2002): **HA 3** - R. Bann, Coleraine (C854304), 12 April to 24 July 1999, 3 May to 8 October 2000, 26 April, 16 June, 30 June 2001 and 25 April 2010 (PHL). L. Neagh: (H9080), no date (McLarnon and Carter, 2000); Ballyronan (H948862), 27 April and 4 May 1999, 10 May and 13 October 2000, 7 May and 22 August 2001, 15 May and 22 May 2011 (PHL). R. Moyola, New Bridge, Magherafelt (H955905), 4 July 2000 (Langton, 2002) and 22 August 2001 (PHL). **DONEGAL: HA 1** - L. Mourne, Ballybofey (H069900), 20 April 2009, EPA (DAM): **HA 36** - L. Tullynasiddagh, Ballyshannon (G983656), 7 July 2009, EPA (DAM): **HA 37** - R. Corabber, Greenan Bridge, Ardnamona (above L. Eske) (G976863), 22 August 1984 (DAM). R. Oily, Claggen (G751803) and L. Shinvagh, Carricode (H005675), 8 August 1982 (PHL): **HA 38** - L. Nacung, upper, Dunlewy (B904191), 19 July 2000 (Langton, 2002). R. Ray, Crocnalaragh (B989272), 12 August 1982 (Hayes, 1991). L. Glen, Glen (C105292), 29 July 2009, EPA (DAM): **HA 39** - L. Akibbon, Church Hill (C068184), 11 June and 9 September 2009, EPA (DAM). L. Fern, Millford (C180233), 16 June 2009, EPA (DAM). R. Crana, Ballymagan (C379344), 15 August 1982, BPH (Hayes, 1991). **DUBLIN: HA 9** - R. Dodder, Bohernabreena aqueduct (O101208), 31 May 1967 (Murray, 1972). **FERMANAGH: HA 35** - L. Melvin, Garrison (G938518), 29 June 2000 (Langton, 2002): **HA 36** - L. Erne, Lower, Boa Island (H108626), 17 August 2011 (PHL). L. Lattone, Kiltyclogher (H003456), 29 June 2000 (Langton, 2002). R. Bannagh, Drummoney Falls, Pettigo (H168676), 17 August 2011 (PHL). **GALWAY: HA 30** - L. Beaghcauneen, Ballinaboy (L679470), 5 April, 18 July

and 12 September 2007, EPA (DAM). L. Bofin, Maam Cross (M034441), 7 June 2007, EPA (DAM). L. Lettercraffroe, Oughterard (M056376), 18 April 2007, EPA (DAM). R. Cregg, Addergsole Bridge (M324350), 16 August 1981 (Hayes, 1991): **HA 31** - L. Ahalia, Maam Cross, north east shore (L971402), 22 April 2009, EPA (DAM). L. Anaserd, Ballyconneely (L605443), 4 April 2007, EPA (DAM). L. Derryclare, Recess (L825485), 16 July 2007, EPA (DAM). L. Nahasleam, Maam Cross (L972440), 6 April, 12 September 2006 and 13 September 2007, EPA (DAM). R. Owentouey, Tullywee Bridge, Recess (L873474), 18 August 1981 (Hayes, 1991): **HA 32** - L. Enask, Beaghcauneen (L662468), 17 September 2007, EPA (DAM). L. Fadda, Beaghcauneen (L668455), 4 April 2007, EPA (DAM). R. Dawros, Tullywee Bridge, Letterfrack (L730586), 18 August 1981 (Hayes, 1991). L. Pollacappul, Kylemore (L754582), 5 June 2007, EPA (DAM). **KERRY: HA 21** - L. Currane, Waterville (V535664), 9 May, 22 July and 10 September 2008, EPA (DAM). R. Inny, Scarriff Bridge (V504696) and u/s Waterville (V525704), 24 August 1983 (Hayes, 1991): **HA 22** - L. Cummernamuck, Killorglin (V745897), 18 July 2008, EPA (DAM). R. Annascaul, Annascaul (Q593017), 2 July 1981 (Hayes, 1991). R. Caragh, Upper Brida Valley (V785810), Lower Brida Valley (V740805), d/s Owenroe R. confluence (V720815), Blackstones Bridge d/s R. Acoose confluence (V710864) and outflow from L. Caragh (V713924), 1975, CD (all Dowling *et al.*, 1981). R. Clydagh, Caherbarnagh (W202842), u/s Clydagh Bridge (W114826) and Knocknagowan (W187837), May to October 1978 and 1979 (Ashe, 1982). R. Flesk, d/s Clydagh/Loo confluence (W084814), Garries Bridge (W082835), Flesk Bridge (W034876), d/s Whitebridge (V987900), d/s New Bridge (V963885) and u/s L. Leane (V964894), May to October 1978 (Ashe, 1982). R. Loo, Aughnanus Bridge, Crohane (W045790), May to October 1978 (Ashe, 1982). **KILDARE: HA 9** - R. Liffey, Sallins (N881245), 17 July 1983 (Hayes, 1991). **LONGFORD: HA 26** - L. Forbes, Cloonard, Newtownforbes (N084821), 25 June and 10 September 2008, EPA (DAM). **MAYO: HA 32** - L. Nanoge, Urlaur (M506903), 23 September 2008, EPA (DAM). L. Doo, Delphi, west shore (L835681), 5 April and 12 July 2006, 3 April 2008, EPA (DAM); north east shore (L834689), 22 August 2002, DAM/WM (DAM). L. Glencullin, Delphi, south west shore (L819696), 25

August 2008, EPA (DAM). L. Nahaltora, Cregganbaun (L794745), 30 September 2004, DAM/WM (DAM). L. Fin, Delphi (L841657), 5 April and 9 May 2006, EPA (DAM). R. Erriff, Ashleigh Falls (L895645), 18 August 1981 (Hayes, 1991). L. Ballin, Westport (L994878), 22 April 2008, EPA (DAM): **HA 33** - L. Keel, north shore, Achill Island (F650058), 7 April 2008, EPA (DAM). L. Carrowmore, Bangor Erris, Derreens (F833299), 9 April and 28 July 2008 and west shore (F830282), 17 September 2008, EPA (DAM): **HA 34** - L. Conn, Inishlee (G182153), 1 October 1965; Longford Point, Crossmolina (G155172), 30 September 1965 and Poulwansha (G160096), 8 April 1965 (all Murray, 1972). L. Levally, Massbrook (G146043), 23 September 2008, EPA (DAM). **MEATH: HA 7** - R. Boyne, Scarriff Bridge (N733527), June 1989 (Murray and Lynch, 1991); Kilcarn Bridge, Navan (N884657), 21 August 1988 (Murray, 1988); Slane Bridge (N965737), and Knowth Weir (N995720), 19 July 1989 (DAM). **SLIGO: HA 26** - L. Gara, Monastredan (M708996), 28 April and 5 September 2008, EPA (DAM). **TIPPERARY: HA 15** - R. Nore, Clonakenny (S116805) and Nore Bridge (S133816), 27 August 1981 (Hayes, 1991): **HA 16** - R. Drish, Athlummon Bridge (S177593), 22 May 1992 (Murray and Lynch, 1992). R. Suir, Rossestown Bridge (S134624), 6 July 1992 and d/s Thurles (S128581), 22 May 1992 (Murray and Lynch, 1992). **TYRONE: HA 1** - L. Mcrory, (H575765), 16 August 2011 (PHL): **HA 3** - L. Neagh, Washing Bay, Coalisland (H903662), 15 May 2002 (PHL). **WATERFORD: HA 18** - R. Blackwater, Ballyduff (W964992), 31 August 1981 (Hayes, 1991). **WEXFORD: HA 12** - R. Slaney, Ballycarney (S967488), 29 July 1981 (Hayes, 1991). **WICKLOW: HA 10** - R. Glencullen tributary, Glencullen (O160212), Brockey (O169207), Glencullen Bridge (O190195), Knocksink (O217182), Enniskerry Bridge (O227173), 1970, KC (Clabby and Bracken, 1976). R. Avonbeg, Meetings Bridge (T188831), 11 July 1997 (Curran, 2001). R. Avonmore, Lion Arch Bridge (T194833), 11 July 1997 (Curran, 2001). R. Avoca, Whitebridge, Tigroney (T198821), 11 July and 27 October 1997 (Curran, 2001); R. Avoca, Avoca Village (T203802), 11 July 1997 (Curran and Murray, 2001): **HA 12** - R. Derry, Balisland (S978645), 28 July 1981 and Bridgeland (T021744), 29 July 1981 (Hayes, 1991). R. Slaney, Knickeen, Glen of Imail (S987948) and Knockgarrigan, Glen of Imail

(S936937), 28 July 1981 (Hayes, 1991).

***Potthastia montium* (Edwards, 1929)**

**KERRY: HA 22** - R. Annascaul, Annascaul (Q593017), 18 April 1981 (DAM). **MAYO: HA 32** - R. Altahoney, Newport (F950050), 1968-1971, EF (Fahy and Murray, 1972). **WICKLOW: HA 10** - R. Avoca, Woodenbridge (T198767), 23 July 1997 (Curran, 2001).

***Protanypus morio* (Zetterstedt, 1838)**

**ANTRIM: HA 3** - Killylane Reservoir, Magherabane, Larne (J292985), 8 May 1999 (PHL): **HA 4** - Altnahinch Reservoir, Slieve (D119234), 22 August 2001 (PHL). **CLARE: HA 25** - L. Graney, Doorus, west shore (R556930), 10 April 2006, EPA (DAM). L. Atorick, Woodford (R637964), 24 May 2003 (PHL): **HA 28** - L. Keagh, Milltown Malbay (R100813), 1 April and 15 September 2009, EPA (DAM). L. Lickeen, Kilfenora, west shore (R168909), 6 April 2009, EPA (DAM). L. Naminna, Boolteagh (R178710), 1 April 2009, EPA (DAM). **CORK: HA 19** - L. Gouganebarra, Inchegeelagh (W009060), 7 April 1966 (Murray, 1972): **HA 21** - L. Bofinna, Bantry (W041488), 8 April 2008, EPA (DAM). **DERRY: HA 1** - Upper Reservoir, Creggan, Derry (C417173), 23 March, 10 May and 18 May 2001 (PHL); Lower Reservoir, Creggan, Derry (C422174), 23 March 2001 (PHL): **HA 3** - R. Bann, Coleraine (C854304), 26 April 2001 (PHL). L. Fea, Draperstown (H760868), 15 May 2002 (PHL). **DONEGAL: HA 36** - L. Tullynasiddagh, Ballyshannon (G983656), 7 September 2009, EPA (DAM): **HA 37** - L. Eske, Donegal (G973844), 17 April 2009, EPA (DAM). L. Shinvagh, Carricode (H005675), 28 March 2004 (PHL): **HA 38** - L. Nabuckan, Grogan More (B850184), 27 July 2005, JRB (DAM). L. Naweelogue, Glenveagh (B974185) and L. Maumlack, Glenveagh (B973190), 4 July 1984 (Twomey, 1984). L. Keel, Kilmacrennan (C158243), 2 April 2009, EPA (DAM). L. Shannagh, Magheradrumman, Fanad Peninsula (C216450), 9 September 2009, EPA (DAM): **HA 39** - L. Gartan, Church Hill (C055159), 9 September 2009, EPA (DAM). L. Fern, Millford (C180233), 2 April 2009, EPA (DAM). **DOWN: HA 3** - Spelga Dam, (J267274), 17 February 1998 (PHL).

**DUBLIN: HA 9** - Upper Reservoir, Bohernabreena (O095219), 9 June 1947 (Fitzgerald, 1947).  
**FERMANAGH: HA 36** - L. Erne, Lower, Black Bay (H072639), 22 March 2003 (PHL). L. Keenaghan, Beleek (G974600), 28 March 2004 (PHL). **GALWAY: HA 30** - L. Anillaun, Maam Cross (L980470), 19 April 2007, EPA (DAM). L. Bofin, Maam Cross (M034441), 7 June 2007, EPA (DAM). L. Corrib (M150450), 1 April 1964, NH (Murray, 1972). L. Lettercraffroe, Oughterard (M056376), 18 April and 5 September 2007, EPA (DAM). L. Maumwee, Maam Cross (L977485), 19 April and 17 September 2007, EPA (DAM): **HA 31** - L. Ardderry, Maam Cross (L982458), 17 September 2007, EPA (DAM). L. Shindilla, Derreennacreeva, Maam Cross (L958460), 13 September 2007, EPA (DAM). **KERRY: HA 22** - L. Acoose, Slievanore, Killorglin (V755854), 24 April 2008, EPA (DAM). L. Coomloughra, Caher Mt., Carrauntoohil (V783849), 26 April 2005, JRB/MC (DAM). L. Guitane, Crohane, Killarney (W025846), 7 July and 14 October 1973 (Douglas and Murray, 1980). L. Leane, Killarney, O'Sullivan's Cascade (V916886), 17 April 1973, Cow Island (V925897), 27 June 1973 and mid lake (V930883), 14 July 1973 (Douglas and Murray, 1980); Killarney (V931886), 22 April and 18 September 2008, EPA (DAM). Muckcross Lake, mid lake (V950850), 1973 (Douglas and Murray, 1980). **LEITRIM: HA 26** - L. Allen, Mountallen, Drumshanbo (G950145), 28 April 2008, EPA (DAM): **HA 35** - L. Glencar, Glencar (G748434), 1 April 2008, EPA (DAM). L. Lackagh, Boleybrack (G920320), 21 April 2005, JRB (DAM). L. Nabrack, Crocknagapple (G860477), 29 April 2005, JRB (DAM). **MAYO: HA 30** - L. Mask, Toormakeady (M097647), 14 April 2008, EPA (DAM): **HA 32** - L. Glencullin, Delphi (L818711), 22 September 2008, EPA (DAM). L. Feeagh, Newport (L975983), 11 April 2008, EPA (DAM). L. Moher, Liscarney, Westport (L977766), 18 September 2008, EPA (DAM): **HA 33** - L. Acorrymore, Achill Island (F578057), 29 September 2004, DAM/WM (DAM) and 17 September 2008, EPA (DAM). L. Bunacurry, Achill Island (F695048), 29 September 2004, DAM/WM (DAM). L. Carrowmore, Bangor Erris, Gortmore (F833266), 9 April 2002, DAM (Murray, 2005) and north west shore (F830282), 17 September 2008, EPA (DAM): **HA 34** - L. Conn, Cloghans (G205133), 7 March 1965, AJOS (Murray, 1972); Illannaglashy (G207070), 7

March 1965, AJOS (DAM); Gillaroo Bay, Massbrook (G175051), 16 August 1965, AJOS (DAM). **SLIGO: HA 35** - L. Talt, east shore (G402151), 10 March 2005, DAM/WM (DAM) and Gleneask (G402151), 10 April and 24 September 2008, EPA (DAM). L. Gill, Sligo (G753335), 3 April 2008, EPA (DAM). **TYRONE: HA 1** - L. Moor, Altishane, Strabane (H446984), 17 August 2011 (PHL). **WICKLOW: HA 9** - Pollaphuca Reservoir, Ballymore Eustace (N995080), 16 October 1981, J. Shiels (Ashe/NMI) and 30 April 2009, EPA (DAM): **HA 10** - L. Bray Lower, Glencree (O140164), 4 June 1986 (DAM) and 2 April 2009, EPA (DAM). Vartry Reservoir, Roundwood: south east shore (O214020), 22 February 1982 (DAM) and 1 September 1982, HD (DAM); north basin (O205050), 6 April 2009, EPA (DAM). R. Glenealo, Glendalough (T090962), 16 July 1996, EMcE/DAM (McEntee, 1997). Outflow from Glendalough Lake Upper, WMNP, Laragh (T109964), 10 February 1980 (DAM) and 16 July 1996, EMcE/DAM (McEntee, 1997); Glendalough Lake Upper, east shore (T110963), 6 February 1980 (Murray, 2005).

*Pseudodiamesa (Pseudodiamesa) branickii* (Nowicki, 1873)

**CORK: HA 21** - L. Avaul, Glengarrif (V910553), 1969, NH (Bracken, and Murray, 1973). **GALWAY: HA 30** - L. Corrib, no data (M1545), 9 September 1964, NH (Murray, 1972). **KERRY: HA 22** - R. Annascaul, Annascaul (Q593017), 2 July 1981 (Hayes, 1991). R. Flesk, d/s Clydagh/Loo confluence (W084814), 22 April 1978 (Ashe, 1982). **WICKLOW: HA 10** - R. Glencullen, Knocksink (O218180), 18 May 1987 (Morgan, 1989).

**SUBFAMILY PRODIAMESINAE**

*Monodiamesa bathyphila* (Kieffer, 1918)

**CORK: HA 18** - R. Blackwater, Mallow (W518975), 1 July 1966, NH (Murray, 1972). **GALWAY: HA 26** - R. Suck, Lismanny (M900255), 11 August 1966, NH (Murray, 1972). **MAYO: HA 34** - L. Conn, Longford Point, Crossmolina (G155172), 10 August and 2 September 1964, 16 June and 30 September 1965, AJOS (Murray, 1972) also Errew, west shore



(G167118), 8 April, 23 August and 1 October 1965, AJOS (Murray, 1972); Six Arch Bridge Bay (G227052), 20 August 1965, AJOS (Murray, 1972).

***Monodiamesa ekmani* (Brundin, 1949)**

**ANTRIM: HA 3** - L. Neagh, Antrim Bay (J135866), 4 May 1999 and Churchtown Point (J056852), 31 May 2011 (PHL). Killylane Reservoir, Magherabane, Larne (J292985), 8 May 1999 (PHL): **HA 5** - L. Mourne, Carrickfergus (J415924), 8 May 1999 (PHL). **CLARE: HA 25** - L. Graney, Doorus, west shore (R556930), 8 June 2006, EPA (DAM). **DERRY: HA 3** - L. Neagh, Toome Bay (H900800), 29 May 1995, LMCL (Langton and McLarnon, 1998); Ballyronan (H948862), 4 May and 24 July 1999 (PHL) also 10 May and 4 July 2000 (Langton, 2002) and 22 August 2001 and 15 May 2002 (PHL). **FERMANAGH: HA 35** - L. Melvin, Garrison (G938518), 29 June 2000 (Langton, 2002). **LEITRIM: HA 26** - L. Allen, Mountallen, Drumshanbo (G950145), 10 June and 7 August 2008, EPA (DAM).

***Prodiamesa olivacea* (Meigen, 1818)**

**ANTRIM: HA 3** - L. Neagh, Lennymore Bay (J115745), 1966 (Marks and Henderson, 1970); L. Neagh, Antrim Bay (J135866), 17 March 2000 (Langton, 2002) and 28 March 2001 (PHL). R. Sixmilewater, Templepartick (J227867), 4 May 1999 (PHL). Killylane Reservoir, Magherabane, Larne (J292985), 8 May 1999 (PHL): **HA 4** - R. Bush, Seneirl Bridge (C943362), 16 July 2000 and Conogher Bridge (C963305), 10 September 2000 (Langton, 2002). Benvarden Pond, Benvarden Garden, Derrykeegan (C946334), 15 May 2005 (PHL): **HA 5** - L. Mourne, Carrickfergus (J415924), 4 and 8 May 1999 (PHL). Raloo Water, Glenoe, Larne (J394967), 8 May 1999 (PHL). **CAVAN: HA 7** - L. Nadreegeal, Ballyjamesduff (N537933), 2 May 2007, EPA (DAM). Park R., Virginia (N591882), 1 December 1967 (Murray, 1972). L. Ramor, Virginia (N612860), 19 September 2007, EPA (DAM): **HA 36** - R. Erne, Drumbarry (N462951), 17 August 1982 (Hayes, 1991). **CLARE: HA 25** - L. Graney, Doorus, west shore (R556930), 4 May 2006, EPA (DAM). L. Derg, d/s Killaloe (M705715), 21 April and 18

September 2009, EPA (DAM): **HA 28** - L. Lickeen, Kilfenora, west shore (R168909), 6 April 2009, EPA (DAM). R. Caher, 2.5km from source, Holywell (M173069), 29 April 2000, CB (Kelly-Quinn *et al.*, 2003). **CORK: HA 19** - L. Gouganebarra, Inchegeelagh (W009060), 8 May 1966 (Murray, 1972): **HA 20** - R. Bandon, Long Bridge, Dunmanway (W242631), 20 March, 18 April, 25 September 1980; Bealabouy Bridge, Dunmanway (W257514), 25 August and 25 September 1980; u/s Ballineen (W331537), 20 February, 20 March, 18 April, 25 August, 25 September, 31 October and 28 November 1980; Ballineen Bridge (W434538), 20 February, 20 March, 27 May, 25 August, 25 September and 31 October 1980; Castle Bernard (u/s Bandon) (W472546), 20 March, 18 April, 25 August, 25 September, 31 October and 22 December 1980; R. Bandon, 2.5km d/s Bandon (W516569), 20 February, 20 March, 25 August, 25 September, 31 October, 28 November, 22 December 1980 and 17 January 1981 (all Morgan, 1982). **DERRY: HA 1** - Upper Reservoir, Creggan, Derry (C417173), 23 March, 26 April, 10 May and 18 May 2001 (PHL); pool, Creggan, Derry (C414171), 18 May 2001 and 17 May 2002 (PHL); Lower Reservoir, Creggan, Derry (C422174), 23 March and 10 May 2001 (PHL); inflow to Upper Reservoir, Creggan, Derry (C413171), 26 April 2001 (PHL): **HA 2** - pool, Roe Valley Park, Limavady (C679201), 9 June, and 14 July 2000 (Langton, 2002); R. Roe, Largy Bridge, Limavaddy (C681202), 14 July 2000 (Langton, 2002); fire dam 1 (C699304) and fire dam 2 (C704314), Binevenagh Forest, Coleraine, 18 May 2000 (Langton, 2002): **HA 3** - Howell's Tarn, Ballywildrick, Coleraine (C766325), 7 April, 21 April and 7 July 2002 (PHL). Downhill Forest stream, Coleraine (C759348), 17 March 1999 (PHL), 25 July 1999 (PHL), 17 March 2000 (Langton, 2002), 21 August 2001 (PHL), 24 March 2002 (PHL); Downhill Lake, Bishops Gate, Coleraine (C762361) and Bishops Gate Garden, Coleraine (C762355), 18 May 2000 (Langton, 2002). Inflow to Balinrees Reservoir, Coleraine (C793307), 20 March 1999 (PHL). R. Agivey, Garvagh (C838154), 30 May 2002 (PHL); R. Agivey Ford, Ballynameen (C827148), 14 June 2008 (PHL). R. Bann, Coleraine (C854304), 18 March to 23 June and 22 September to 13 October 1999; 19 February to 7 June and 8 October 2000; 26 April 2001, 22 September 2002, 11 April to 2 May 2010 (PHL). L. Neagh, (H9080), no date (McLarnon and

Carter, 2000); L. Neagh, Ballyronan (H948862), 27 April 1999 (PHL). R. Moyola, New Bridge, Magherafelt (H955905), 13 October 2000 (Langton, 2002) and 7 May 2001 (PHL). **DONEGAL: HA 37** - R. Eany, d/s Eanybeg confluence (G842815), 10 August 1982 (Hayes, 1991); **HA 38** - R. Owenveagh upper, Ballaghgeeha, Glenveagh (B970160), 29 July 1985 (Heneghan, 1986). L. Glen, Glen (C105292), 29 July 2009, EPA (DAM); **HA 39** - L. Akibbon, Church Hill (C070185), 21 July 1983 (Reynolds, 1983); L. Akibbon, Church Hill (C068184), 9 September 2009, EPA (DAM). R. Swilly, Newmills, Letterkenny (C125092), 18 July 2000 (Langton, 2002); **HA 40** - R. Keenagh, Hugh Roe's Bridge, Umgall (C454543), 16 August 1982 (Hayes, 1991). **DOWN: HA 3** - tributary of Upper R. Bann, Tullyconnaught (J166451), 19 September 1997 (PHL); Dooghary (J137443), 27 August 1998 (PHL) and Shanrod (J215453), 14 August 1998 (PHL); Upper R. Bann, Katesbridge (J210407), 19 September 1997 (PHL); Eel Burn, Shanrod House, Shanrod (J223477), 19 September 1997 and 14 July 1998 (PHL); Upper Bann tributary, Shanrod (J207439), 19 September 1997 and 14 August 1998 (PHL); Upper Bann, Banbridge (J168443), 19 March 1998 (PHL); Upper Bann tributary, Tirkelly (J223364), 19 September 1997 (PHL). R. Muddock, Muddock Bridge, Rathfriland (J235342), 19 September 1997 (PHL). R. Rocky, d/s R. Shanky confluence, Hilltown (J233277), 26 September 1997 (PHL). Glenaveagh stream, Glenaveagh Bridge (J255284), 26 September 1997 (PHL). Drumadonnell R., Ballyward (J273383), 28 August 1997 (PHL). **DUBLIN: HA 9** - pond, University College Dublin, Belfield (O185300), 25 April 1973 (DAM). R. Dodder, Pussy's Leap, Templeogue (O126281), 8 May 1966 (Murray, 1972); Clonskeagh Bridge (O174306), 11 March 1949, CFH (Reilly, 1951) and 16 July 1967 (Murray, 1972). Lake, Zoological Gardens Dublin (O130350), July 1987, DAM/RH (Murray *et al.*, 1987). Pool near beach, Killiney (O261250), 10 December 1951, CFH (DAM). **FERMANAGH: HA 36** - R. Hollybrook, Lisnaskea (H373310), 27 June 2000 (Langton, 2002). R. Colebrook tributary, Drumcleave, Brookeborough (H367427), 15 September 1997 and 24 September 1998 (PHL); R. Colebrook, Tattenbuddagh Bridge, Brookeborough (H458428), 29 September 1997 (PHL); R. Colebrook tributary, Raw (H424426), 3 October 1997 (PHL) and

Beagh (H483480), 18 September 1998 (PHL). **GALWAY: HA 25** - R. Woodford, Woodford (M732000), 24 May 2003 (PHL): **HA 26** - R. Shiven, d/s Ballinaglass (M788494), 29 July 1981 (Hayes, 1991). R. Tirur, Newbridge (M492699), 16 August 1981 (Hayes, 1991): **HA 29** - L. Cutra, Gort (R485986), 24 May 2003 (PHL): **HA 30** - L. Ballyquirke, Moycullen (M232317), 13 April 2007, EPA (DAM). Pool at lay-by on road N59, Moycullen (M204336), 25 May 2003 (PHL): **HA 32** - L. Ballynakill, Cleggan (L639581), 3 April 2007, EPA (DAM). **KERRY: HA 22** - L. Caragh, Killorglan (V719904), 15 July 2008, EPA (DAM). Cushvally Lake, Gap of Dunloe, Killarney (V875863), 1973 (Douglas and Murray, 1980). L. Kilbrean, Killarney (W005935), 8 September 1969, NH (Bracken and Murray, 1973). L. Leane, Killarney, Muckross Boathouse (V965866), 29 August 1987, NOM (LJH). Muckross Lake, Dundag Bay (V964858), 1973 (Douglas and Murray, 1980); Muckross Lake, Muckross, Killarney (V950853), 18 September 2008, EPA (DAM). R. Annascaul, Annascaul (Q593017), 2 July 1981 (Hayes, 1991). R. Caragh, confluence with R. Acoose (V710860) and Blackstones Bridge, d/s R. Acoose confluence (V710864), 1975, CD (Dowling *et al.*, 1981). R. Clydagh, Caherbarnagh (W202842), May to October 1978 (Ashe, 1982). R. Flesk, d/s Clydagh/Loo confluence (W084814) and Flesk Bridge (W034876), May to October 1978 (Ashe, 1982); White Bridge (V987904), 25 July 1974 (DAM); New Bridge (V968896), 30 May 1973 (Douglas and Murray, 1980); d/s New Bridge (V963885), 14 May 1978 (Ashe, 1982) and u/s L. Leane (V964894), May to October 1978 (Ashe, 1982). R. Loo, Aughnanus Bridge, Crohane (W045790), May to October 1978 (Ashe, 1982): **HA 23** - L. Cam, Castlegregory (Q597079), 29 April 2008, EPA (DAM). **KILDARE: HA 7** - R. Boyne, Leinster Bridge (N665435), 6 June 1989 (Murray and Lynch, 1991). **KILKENNY: HA 15** - R. Nore, Norelands Bridge (S547436), 28 August 1981 (Hayes, 1991). **LAOIS: HA 15** - R. Nore, Castletown Bridge (S326930) and Kilbricken (S362898), 27 August 1981 (Hayes, 1991). **LEITRIM: HA 26** - L. Allen, Drumshanbo Lock (G968110), 30 March 2000 (DAM): **HA 35** - L. Belhavel, Killarga, Dromahair (G878288), 2 April 2008, EPA (DAM). L. Glencar, Glencar (G748434), 1 April 2008, EPA (DAM). **LONGFORD: HA 26** - R. Camlin, Mullagh Bridge, d/s Longford

(N116760), April 1965, 4 May 1965 (Murray, 1972) and June 1965 (DAM); R. Camlin tributary, Longford Racecourse (N149767), April and June 1965 (DAM). **MAYO: HA 32** - Louisburg (L807807), 1910, CM (Grimshaw, 1912). R. Bunowen, Louisburg, 7 May and 5 August 2004, DAM/WM (DAM). Westport L., Westport Woods Hotel, Westport (L985843), 7 May 2004, DAM/WM (DAM). L. Knappabeg, Westport (M010803), 21 April and 23 July 2008, EPA (DAM): **HA 33** - L. Keel, Achill Island (F641055), 17 September 2008, EPA (DAM). L. Bunacurry, Achill Island (F695048), 29 September 2004, DAM/WM (DAM). L. Carrowmore, Bangor Erris, Derreens, north east shore (F833299), 9 April 2008, EPA (DAM) and Cloontakilla Bay, south east shore (F851253), 17 June 2008, EPA (DAM). Bog pools, Glenamoy (F896345), July 1973, CD (Dowling, 1975; Dowling and Murray, 1981): **HA 34** - L. Conn, Cloghans, north east shore (G205133), 9 September 1968 (Murray, 1972). R. Moy, Cloongullaun (G348016), 30 August 1982 (Hayes, 1991): **Clare Island** - R. Doree, Lecarrow (L698867), 5 June 2002 (Murray and Murray, 2003) [Grimshaw (1912) reported *Prodiamesa obscurimana* Mg. from Clare Island, collected in July 1910 personally and by J. N. Halbert (Grimshaw, 1912). Murray and Murray (2003) considered these as possible records of *P. olivacea*]. **MEATH: HA 7** - R. Kinnegad, Kilwarden Bridge (N623460) and Ballyboggan (N638402), 6 June 1989 (Murray and Lynch, 1991). R. Boyne, Bellinter Bridge (N894625), 21 January 1966 (Murray, 1972); opposite inflow of R. Skane (N895628), 3 May 1982 (DAM); Stackallen Bridge (N917713), Oldbridge (O045761) and d/s Oldbridge (O062753), 19 July 1989 (DAM). Marsh, Ardsallagh, rere of garden (N893639), 9 May 1982 (DAM). R. Blackwater: Carnaross Bridge (N685779), 4 November 1975, 12 December 1975 and 30 March 1976; Sedenrath Bridge (N762759), 12 December 1975 and 30 March 1976 (all O'Flaherty, 1976); Clavens Bridge, Kells (N715775), 31 October 1967 (Murray, 1972); Donaghpatrick (N819723) and Poolboy Bridge, Navan (N871681), 18 August 1988 (Murray, 1988). Yellow R., tributary of R. Blackwater, Randalstown, Navan (N842718), 26 April 1996 (Finnegan, 1998): **HA 8** - stream/pond, Meadesbrook, Kilmoon (O038594), 3 April 1999, 15 November 2005, 9 June 2006 (DAM). **MONAGHAN: HA 6** - L. Naglack, Carrickmacross (H853026), 3 May

2007, EPA (DAM). L. Monalty, Carrickmacross (H866027), 14 September 2007, EPA (DAM): **HA 36** - L. Avagnon, Latton, Cotehill (H688133), 4 April 2007, EPA (DAM). L. Drumlona, Rockcorry (H636176), 4 April 2007, EPA (DAM). **OFFALY: HA 7** - Yellow R., tributary to R. Boyne, Garr Bridge (N532370), 6 June 1989 (Murray and Lynch, 1991). R. Boyne, Kinneged R. confluence (N680446), 6 June 1989 (Murray and Lynch, 1991): **HA 25** - R. Little Brosna, Ryan's Cross (S053882), Milltown Park (S068907) and Brosna Bridge (S077938), 2 September 1982 (Hayes, 1991). **ROSCOMMON: HA 26** - R. Frances, Castlerea (M694860), 28 April 2004, JRB (DAM). R. Suck, Castlecoote (M809627) and Ballyforan (M817464), 16 July 1981 (Hayes, 1991). Grange L., Greywood, Strokestown (M938857), 8 April 2008, EPA (DAM): **HA 30** - R. Dalgan, Clonfad (M518712), 20 August 1981 (Hayes, 1991). **SLIGO: HA 35** - L. Gill, Sligo (G753335), 3 April 2008, EPA (DAM). **TIPPERARY: HA 15** - R. Nore, Clonakenny (S116805) and Nore Bridge (S133816), 27 August 1981 (Hayes, 1991): **HA 16** - R. Breaghagh, Archerstown Bridge (S140568), 22 May 1992 (Murray and Lynch, 1992). Brownstown R., Kilclonagh (S167655), 6 September 1991 (Murray and Lynch, 1992). R. Clover, Twomileborris (S199590), 6 July 1992 (Murray and Lynch, 1992). R. Drish, Castletown (S207634), 6 September 1991 (Murray and Lynch, 1992) and Athlummon Bridge (S177593), 6 July 1992 (Murray and Lynch, 1992). R. Suir, Loughmore (S120670), 6 July 1992 (Murray and Lynch, 1992): **HA 25** - R. Ollatrim, Moneygall (S042773), 14 April 2004, JRB (DAM). R. Kilmastulla, Kilmastulla Bridge (R728698), 3 September 1981 (Hayes, 1991). **TYRONE: HA 1** - pool near R. Glenelly, Upper Barnes (H553904), 17 August 2011 (PHL). **WATERFORD: HA 18** - R. Blackwater, Ballyduff (W964992), 31 August 1981 (Hayes, 1991). **WESTMEATH: HA 7** - bog tributary of R. Kinnegad, u/s of bridge number C1/44/18-CFB (N562442), June 1989 (Murray and Lynch, 1991): **HA 25** - Lacy's Canal at L. Ennell (N420500), 4 February 1975 (DAM). L. Ennell, Tudenham (N415466), 2 May 1966 (Murray, 1972): **HA 26** - L. Killinure, Ballaghkeernan Bay (N069445), 24 April 2007, EPA (DAM). **WEXFORD: HA 11** - R. Ounvarra, Ballycanew (T153519), 6 May 2006 (DAM): **HA 12** - Crossabeg steam, Crossabeg, Castletown (T023270), 6 May 2006 (DAM): **HA 13** - R. Corrock tributary, Goff's Bridge,

Horetown (S870185), 12 June 2012, DAM/WM (DAM). **WICKLOW: HA 10** - R. Glencullen, Knocksink (O218180), 22 April 1987, DEM/DAM (Morgan, 1989). Roundwood Reservoir, Roundwood (O214002), 13 August 1983, HD (DAM). R. Glenealo, Glendalough (T090962), 16 July 1996, EMcE/DAM (McEntee, 1997). R. Avonbeg, Meetings Bridge (T188831), 27 October 1997 (Curran, 2001). R. Avoca, Whitebridge, Tigroney (T198821), 1 July 1997 (DAM) and 27 October 1997 (Curran, 2001); Avoca Village (T203802), 11 July 1997, FC/DAM (Curran and Murray, 2001) and October 1997 (Curran, 2001).

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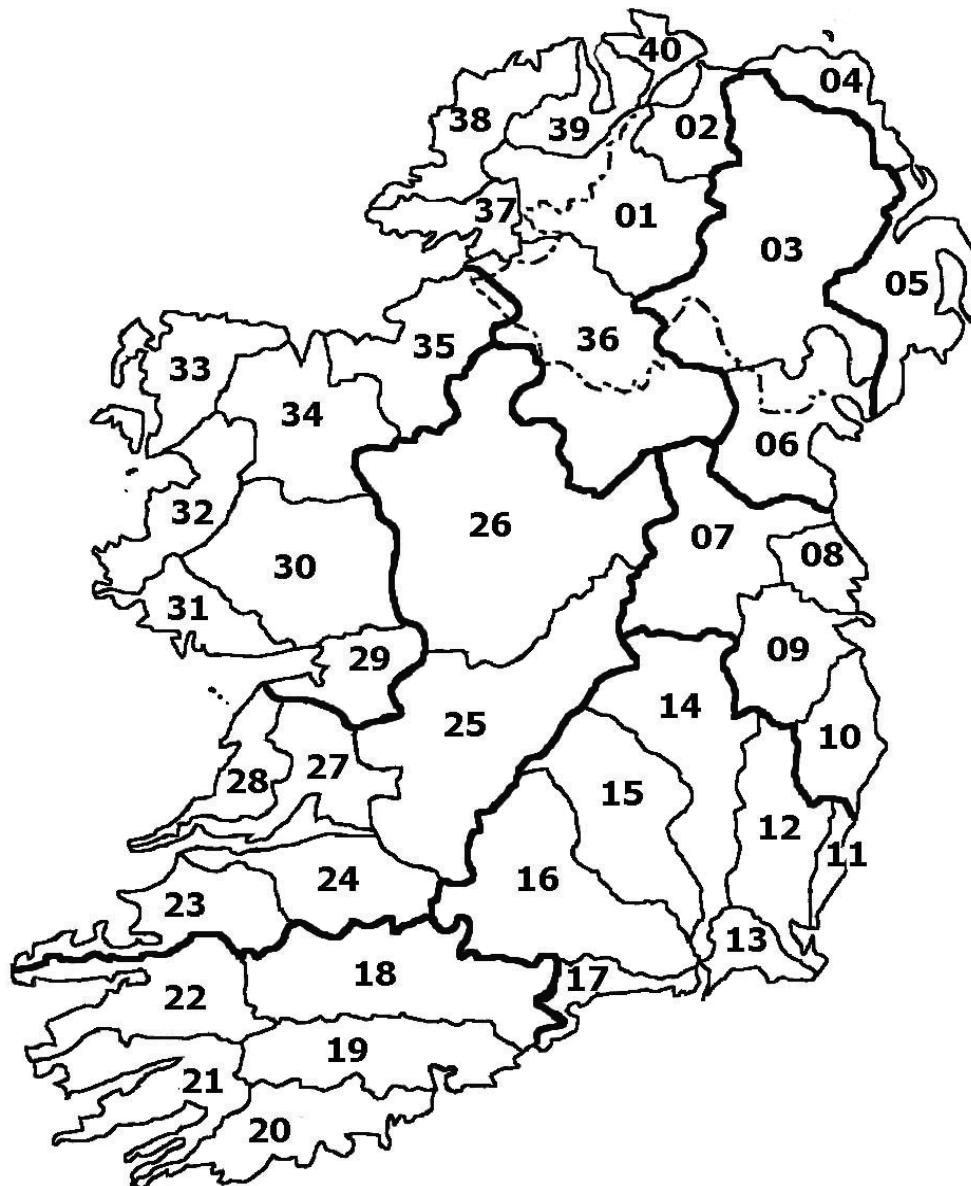
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**FIGURE 1.** The counties of Ireland.



**FIGURE 2.** The forty hydrometric areas of Ireland. Heavy lines illustrate demarcations of designated River Basin Districts (Water Resource Regions) consisting of hydrometric areas as follows: **North Western** - HA 01, 02, 36, 37, 38, 39, 40. **Neagh-Bann** - HA 03 and 06. **North Eastern** - HA 04 and 05. **Eastern** - HA 07, 08, 09, 10. **South Eastern** - HA 11, 12, 13, 14, 15, 16, 17. **South Western** - HA 18, 19, 20, 21, 22. **Shannon** - HA 23, 24, 25, 26, 27, 28. **Western** - HA 29, 30, 31, 32, 33, 34, 35. Dashed line indicates the international boundary.





NOTICE



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