

“PER ISOPODA AD ASTRA” - 50 YEARS OF ISOPOD RECORDING**Paul T. Harding**

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Quite a lot has been written about the origins, history and achievements of the recording scheme covering woodlice and waterlice in Britain and Ireland. Rather than repeat existing information, reference is made to key publications, many of which are available to download or view online. Nevertheless, some stories may be worth repeating or expanding.

TO BEGIN AT THE BEGINNING....JANUARY 1968, A COLD EVENING IN CAMBRIDGE

Following the winter meeting of the British Ecological Society in Cambridge, Stephen Sutton and John Metcalfe were sitting in a pub, developing ideas for what became the Isopod Survey Scheme (ISS). Unknown to them, Paul Harding was cycling out of the city to nearby Histon for another night-shift at the jam factory, having spent the afternoon in a Cambridge library extracting woodlice records from dusty volumes. The three finally met in the following autumn to develop plans towards launching ISS in December 1968; none of them could have imagined that the successor of the scheme would still exist 50 years later.

Sutton and Metcalfe developed a pioneering recording card (for woodlice, waterlice and some, mainly littoral, marine species) which was also aimed at recording broad habitats for the species. The card was intended for recording which species occurred at a single habitat and location on one occasion, rather than summarising records from a large spatial unit such as a 10km square. On the advice of David Burn,



Paul Harding loading a Tullgren funnel at Monks Wood, c. 1965

a PhD student with Sutton at Leeds, the card was designed for the data to be computerised, and it was printed in the spring of 1968. Harding became involved after the card had been produced, and in 1969, the British Isopoda Study Group (BISG) was launched to host the Isopod Survey Scheme. John Metcalfe¹ soon moved on to build a successful career in psychology, but Sutton and Harding remained actively involved with the scheme. Harding took on the role of scheme organiser for woodlice and waterlice in October 1971 having recently taken up a junior post in the Woodlands Section of the Nature Conservancy at Monks Wood near Huntingdon.

At that time, very few people in Britain or Ireland had an active interest in woodlice or waterlice, and most had only a few years of practical experience. Woodlice had been quite well studied by some naturalists, up to the 1920s, and by a few individuals into the early 1950s, but most of that cohort of experience had died, moved abroad or gone on to study other taxa. Academic research had been minimal and marine Isopoda were a largely neglected group.

¹ <https://thepsychologist.bps.org.uk/volume-28/november-2015/dr-john-alban-metcalfe-1940-2015>

THE BIOLOGICAL RECORDS CENTRE, AND WORKING WITH THE BRITISH MYRIAPOD GROUP

During 1969, through the agency of the Biological Records Centre (BRC) at Monks Wood, BISG was brought together with the members of the embryonic British Myriapod Group (BMG), including the prospective scheme organisers Colin Fairhurst (millipedes) and Tony Barber (centipedes). A shared approach to recording the habitats of woodlice/waterlice, centipedes and millipedes was developed and BRC printed new recording cards for BISG and BMG in June 1970, using a more detailed, hierarchical habitat recording format. A separate recording card for marine Isopoda, with an analogous habitat recording system (for mainly littoral habitats), was developed in 1972 by David Holdich and Roger Lincoln as part of the Isopod Survey Scheme. Unfortunately recording marine Isopoda attracted little support from volunteers, despite the publication of a key (Naylor, 1972), so that this part of the ISS was eventually discontinued.

THE EARLY YEARS (1968 TO 1985)



Stephen Sutton and Paul Harding in 2015

Anyone with an obsessive interest in the early years should read the prefatory Introduction to Doogue & Harding (1982), the Recording chapter in Harding & Sutton (1985), the introductory sections of Harding (1990) and the Recording in Britain and Ireland chapter in Gregory (2009) for greater detail.

An important objective at the start was to recruit recorders and help them gain more experience in identification and in field recording. Regular newsletters² were produced by BISG and residential field meetings were organised at locations in England, Wales and Ireland every couple of years. A growing

band of regional experts, such as Declan Doogue, Glyn and Dawn Collis, Douglas Richardson and Adrian Rundle, also organised local meetings, particularly designed to recruit and help inexperienced recorders. The success of the first combined BISG/BMG field meeting in 1983 at Lancaster resulted in a joint meeting being held in subsequent years.

The publication of Stephen Sutton's *Woodlice* (Sutton, 1972), with its off-printed illustrated key (Sutton, Harding & Burn, 1972), provided an additional impetus to recording, improving on the keys in Edney (1954) and drawing on early results from the ISS. Hilary Burn's colour paintings in the key even made woodlice look attractive!

Discounting any erroneous species that may have been added by W.E. Collinge (see Harding, 1977), only three species of woodlice (all hothouse aliens) had been added to the British list since 1913. In comparison, six species, all apparently native, were added to the British list between 1968 and 1983, including *Metatrichoniscoides celticus* new to science. Although *Eluma caelatum* was new to Britain in 1975, it had been recorded in Ireland since 1908.

Automated data handing in this period was primitive. Even the 1970 recording card was designed around the constraints of an 80-column punched card³, although that was a considerable advance on the 40-column punched cards used originally at BRC. A *Provisional Atlas* (Harding 1976) was published

² <http://www.bmig.org.uk/view/resource/bisg-newsletter>

³ https://en.wikipedia.org/wiki/Punched_card

using maps that had been hand-plotted because at that time BRC did not have the resources to process the ISS data. During a family holiday on the Suffolk coast in June 1976, I remember plotting the maps on the dining room table, with half an eye on my younger daughter who was just beginning to crawl.



Four woodlice discovered new to Britain between 1968 and 1985

A) *Metatrichoniscoides celticus*; B) *Miktoniscus patience*; C) *Buddelundiella cataractae*;
D) *Stenophiloscia glarearum*. Images from BMIG website www.bmig.org.uk

Beginning in 1975, Declan Doogue had built-up a small team of woodlice recorders in Ireland, with a strong emphasis on developing the enthusiasm and skills of mainly young naturalists. By the end of 1980, all but one of the species that had been known from Ireland at the time of the previous comprehensive review (Pack-Beresford & Foster, 1911) had been rediscovered, and eight species had been added. In 1981 Declan and Paul Harding began work on what would become the *Distribution Atlas of Woodlice in Ireland* (Doogue & Harding, 1982) documenting for the first time information about the habitats of species as well as the distribution of species. In these pre-internet times communication between Declan in Dublin and Paul at Monks Wood was limited to the telephone and post. One frantic weekend together in Dublin helped to finalise the text (and to do a certain amount of essential car maintenance), but it took us longer than planned. Administrative difficulties with the publisher meant that the atlas was not published until early 1983.

By 1982 sufficient data had been collected to plan what would eventually be published as *Woodlice in Britain and Ireland* (Harding & Sutton, 1985). The analysis of the habitat data for this atlas was described by Harding & Sutton. This work was inextricably linked with the analyses being developed by Colin Fairhurst and colleagues at Salford University using analogous data for millipedes and centipedes from the BMG schemes.

The role of organiser of the recording scheme passed from Paul Harding to George Fussey in 1982, soon after Paul was appointed as the Head of BRC. George had recently completed post-graduate research on *Trichoniscus pusillus* with Stephen Sutton at Leeds University and was embarking on a career in teaching, including 30 years at Eton College. The handover was an opportunity for changes to the scheme, with a new recording card that included the additional species. Also the habitat recording element of the card was removed, mainly because it had been considered to make recording too complicated. In 1986, now established in a Lecturer post at Reading University, Steve Hopkin took over as scheme organiser, having completed post-doctoral research on invertebrates and heavy metals pollution at Bristol University (see Hopkin, 1989).

By the early 1980s research on British and Irish woodlice, particularly at Leeds, Bristol and Nottingham, had come to the attention of wider academic circles. The Zoological Society of London invited Stephen Sutton and David Holdich to organise an international symposium on The Biology of Terrestrial Isopoda which was held at London in July 1983 (Sutton & Holdich, 1984). The British contributors presented results from a wide range of recent research to a truly international audience. Unfortunately it was premature to present results from the ISS in 1983, but the 2nd International Symposium, held at Urbino in Italy in 1986, eventually resulted in a paper summarising habitat and biogeographic data drawn from the scheme (Sutton & Harding, 1989). International symposia on terrestrial Isopoda have continued at irregular intervals, but contributions from British workers have declined.

Stephen Sutton had used the motto *per isopoda ad astra* (“through Isopoda to the stars”) in his brief report on the 1st International Symposium in ISS Newsletter No 17. From where all this had started in 1968, it was probably a justifiable statement of ambition! Stephen’s close involvement with BISG and the scheme continued until the late 1980s, by which time his work on tropical forest ecology and projects such as Operation Drake and Operation Raleigh had increased⁴.

A LITTLE BIT ABOUT WATERLICE

Gregory (2009) provides a thorough review of records of the four species of waterlice, but in the early years of BISG, little effort had been put-in to recording them. However, Professor H.P. (Philip) Moon and Professor W.D. (Bill) Williams had been actively working on the two native, mainly surface-dwelling species since the 1950s. By the time the ISS was launched, Williams was working in Australia, but he kindly provided many records from his earlier research. Philip Moon and Paul Harding brought together Moon’s own records with those of Williams and scattered other records, in particular of the stygobite *Proasellus cavaticus*, in a preliminary review (Moon & Harding, 1981) published shortly before Moon died. Despite peddling this review to anyone that would take a copy, and the availability of three editions of an illustrated key to species (see Gledhill, Sutcliffe & Williams, 1993) waterlice have remained quite poorly recorded as part of the scheme. Much of the monitoring of aquatic fauna in inland waters fails to differentiate between the two common species of waterlice. Subterranean aquatic fauna remains poorly studied (see Proudlove, *et al.* 2003).

THE MIDDLE YEARS (1986 TO 2000)

Steve Hopkin, who ran the scheme from 1986 to 1991, led several initiatives and developments. He soon established a small research team around him at Reading which helped advance knowledge of several species, including the addition of two cryptic species that previously had been confused with commoner species. Steve published a thoughtful review of the biogeography of species (Hopkin, 1987)

⁴ <http://stephensutton.info/home/>

drawing on data used in the 1985 atlas and subsequent records. He founded, edited and produced the journal *Isopoda* which ran to four issues between 1987 and 1991, publishing several key papers. The publication of his AIDGAP *Key to the Woodlice of Britain and Ireland* (Hopkin, 1991) was a major step in improving the resources for the identification of species. It was notable for the 32 colour photographs, by Steve himself, which illustrate about half the species. The ability to publish colour photographs inexpensively was later developed by Steve and the Field Studies Council to produce a six page folding leaflet *The Woodlouse Name Trail* as a key to common species (Hopkin, 2003).

A more traditional approach to a key to the identification of woodlice was eventually published in 1993 in the *Synopses of the British Fauna* series (Oliver & Meechan, 1993). Although published two years after Hopkin's AIDGAP key, the *Synopses* volume relied on monochrome whole-animal drawings of most species and plenty of detailed taxonomic drawings. The quality of the illustrations was generally excellent, although the absence of colour photographs was noted in some reviews. Graham Oliver had made important contributions to the ISS in the 1980s, notably in publishing descriptions of three species new to Britain and also providing descriptions and illustrations of these and one other species included in Harding & Sutton (1885).

By the time Steve Hopkin handed on the baton of scheme organiser to Dave Bilton in 1991, and although his interest in woodlice continued, Steve had already diversified his work to include millipedes (for example Hopkin & Read, 1992), and Collembola (see Hopkin, 1997). Steve's untimely death in a traffic accident at the age of 50, soon after taking early retirement, was a tragic loss of a uniquely talented and stimulating colleague and delightful friend to many⁵.

Dave Bilton bravely took on the role of scheme organiser early in his career – whilst at Oxford and working for his PhD. Dave's nine year period as organiser saw several moves after being awarded his PhD, with research fellowships at Uppsala University, York University, back to Oxford University and finally to Plymouth University in 1996. Dave is now Professor of Aquatic Biology at Plymouth. Steve Hopkin and Dave had planned to update the woodlice distribution maps in a further volume of *Isopoda* but, for various reasons, this never happened. The planned work was probably a victim of their respective



Steve Hopkin at the Ento'03 conference at Reading University

developing careers, at a time when work pressure on everyone in academia was increasing rapidly. It was also a time when BRC was unable to provide consistent support to the scheme due to other demands on its limited resources. But, the scheme remained active and BISG Newsletters from the period include accounts of many important finds and of the annual field meetings. Steve Gregory, a protégé of Steve Hopkin from the 1980s, and Jon Daws were remarkably active and successful in producing many new and often surprising records. Jon's knack of finding the unusual and his amusing reports on various recording expeditions, published in the BISG Newsletter in the 1990s, demonstrate the lengths to which dedicated recorders will go in pursuit of their chosen taxa.

Jon Daws (1994) was also the first to produce a local atlas, covering Leicestershire, but Steve Gregory and Paul Richards soon followed up in 1995 with their respective atlases for Oxfordshire and the Sheffield area. These atlases also marked an increasing trend for records to be submitted to local records

⁵ <http://www.bmig.org.uk/sites/www.bmig.org.uk/files/bulletin/BullBMIG22%20p2-8%20Obituary%20SPHopkin.pdf>

centres, sometimes as well as to the ISS. Although national experts such as Steve and Paul also worked in their respective local areas, most counties were less well served with expertise to validate local records. Woodlice have sometimes been perceived as being “an easy group” for novice recorders to learn how to identify invertebrates. With the growth of local records centre throughout the 1990s there have been occasions when locally curated records have had to be queried as part of the scheme. Steve’s Oxfordshire Atlas (Gregory & Campbell, 1995) was a product of his activities as an increasing national expert and the work of a well-run local records centre. Paul’s pioneering local identification guide and atlas (Richards, 1995) grew out of his work at Sheffield City Museum and his courses on identification and recording for local naturalists.

At the 1999 joint annual field meeting held at Forde Castle in Northumberland, members of BISG and BMG agreed that it might be to the advantage of the two groups to merge as a single ‘society’, with a constitution and a committee. After all, we had been getting together for field meetings since the 1980s! Several members with an understandable dislike of bureaucracy had resisted the idea of a formal ‘society’ for several years, but we eventually agreed that it was worth a try!

RECENT YEARS (2000 TO 2017)

The merger of BISG and BMG to form the British Myriapod and Isopod Group (BMIG) was agreed unanimously at the annual joint field meeting held at Saffron Walden, Essex, just after Easter 2000. A committee was elected and roles distributed among the willing or persuadable.

The year 2000 saw other changes for the isopod scheme, the main one being that Steve Gregory took on the role of scheme organiser from Dave Bilton. Isopod recorders also now had the opportunity to publish isopod papers in the renamed *Bulletin of the British Myriapod and Isopod Group*, and there was a new BMIG Newsletter (the last BISG Newsletter having been produced in 1998). Thankfully, our digital dataset was not lost to the Millennium Bug⁶ – a predicted IT apocalypse that never really happened.

Steve Gregory’s work, initially with Oxfordshire Biological Records Centre and the Northmoor Trust in Oxfordshire, has involved survey and monitoring many taxonomic groups locally and widely elsewhere in Britain. Before he took over as organiser of the isopod scheme, Steve had been recording all the BMIG groups for more than a decade, contributing many unusual records and developing his identification skills. He soon set about revitalising the scheme, publishing new records and challenges to recorders in the BMIG Newsletter. Over the years he has taken on key roles within BMIG including co-editing and doing the layout of the Bulletin. More recently Steve has been the web-master for the BMIG website that was re-designed by and is hosted by BRC. Steve set himself the task of assembling, and making available via the website, the growing resource of bulletins, newsletters and early publications of BMIG and its predecessors. He also led on setting up the BMIG Library and reference collection at the base of the British Entomological and Natural History Society (BENHS) at Dinton Pastures near Reading. BMIG is one of several smaller national societies that are affiliated to BENHS.

An early objective for Steve was to bring together the increasingly scattered datasets for woodlice. By 2001 it was clear that recorders were storing their own data in a variety of digital formats – his note in BMIG Newsletter No 3 identified the problems and his planned approach to collating records. His longer term objective was to work towards a completely new atlas and to this end he used the BMIG Newsletter to publish selected up-dated species maps to encourage us to record.

⁶ https://en.wikipedia.org/wiki/Year_2000_problem



Participants at the 2005 BMIG field meeting in Durham

Front row, left to right; Ken Hill, Glyn Collis, Dick Jones, Helen Read, Valerie Standen, Eric Philp & Paul Lee. Middle row; Peter Nicholson, Tony Barber, Paul Harding, Kelly Inward, Shona Turnbull & Richard Price. Back row; Mike Davidson, Desmond Kime, Steve Gregory & Mark Frater.

All three BMIG schemes have continued to work closely with BRC, including for some data processing. Although Paul Harding had retired from BRC in 2003, BMIG's interests were not overlooked in the ever-growing demands of initiatives such as the National Biodiversity Network, and data for woodlice have been used in joint research projects (e.g. Purse, *et al.*, 2012). When BRC staff moved to be based near Wallingford, Oxfordshire in 2008, Steve was well placed to liaise with BRC, initially with regard to his atlas, and subsequently regarding the BMIG website.

Steve worked in his 'spare' time over a couple of years to prepare the text and maps for the new atlas (Gregory, 2009). The comprehensive text and up-to-date maps of this atlas demonstrate the progress that had been achieved in over 20 years since the previous atlas. Steve drew extensively on his own practical knowledge and information resources, such as newsletters and published papers, to provide wide-ranging text. The maps will gradually become out-of-date as a result of more recording, but the text will certainly remain a primary source of information about woodlice for a further 20 years.

INTO A DIGITAL WORLD

Information technology (IT) has been integral to the development of the scheme. The first recording card produced for the scheme by BRC in 1970 was designed for the resultant records to be processed mechanically, using punched cards, and the data analysed electronically. The habitat analyses summarised in Harding and Sutton (1985) would not have been possible without the use of statistical packages on the dataset using computing facilities at Salford University.

Although this is not the place to review advances in IT since 1970, a few important developments regarding the scheme's use of IT should be mentioned. Steve Gregory has observed that, as scheme organiser, email has greatly reduced the turn-around time in giving recorders feedback on their records and identifications.

The website - The original BMIG website was set up by Craig Slawson and further developed by Glyn Collis. Complete re-development was undertaken as part of BRC's support for BMIG, so that <http://www.bmig.org.uk/> is now the focus for information (present and past) about BMIG, the recording schemes and the respective taxonomic groups.

Photography - The role of high definition photographs in aiding species identification came to the fore in the 1990s, for example in Hopkin (1991) and Richards (1995). Subsequent developments in digital photography and camera technology have led to further advancements in quality and definition. This is ably demonstrated by the species photographs in Gregory (2009) and those on BMIG website provided by a number of contributors, notably Paul Richards and Keith Lugg.

Richards (2011) - With support from BMIG and a grant through the OPAL project, Paul Richards was able to greatly expand and develop the concept of his Sheffield booklet (Richards, 1995) into a national scale, digital resource for BMIG (Richards, 2011). Drawing on his experience in practical training courses for inexperienced naturalists and his excellent photographs this e-Book is a pioneering approach to teaching about, and how to identify, woodlice, millipedes and centipedes.

Digital publishing - Beginning in 2015, new volumes of the BMIG Bulletin and editions the BMIG Newsletter are published only on-line, as PDFs downloadable free of charge from the BMIG website. Back numbers of all previous BMG Bulletins, Isopoda and all BISG and BMG newsletters are also available.

National Biodiversity Network (NBN) - The woodlouse data set as used in Gregory (2009) is available on-line through the NBN Atlas <https://nbnatlas.org/>. The main principle of the NBN Atlas is to capture wildlife data once in a standard electronic form, to integrate data from a variety of sources, and to make data freely available. The NBN Atlas enables data to be quickly and easily accessed to provide understanding of the occurrence of particular species in the UK. But users need to be aware of the quality of some datasets that may be available via the NBN Atlas. More recent records of woodlice, verified by the scheme, will be added in due course.

iRecord - This online website was set up by BRC for the submission of biological records of any type, including isopods. Photographs to support the records can be included, which help national experts to verify the records. Once verified, records can then be included into the datasets of national recording schemes (including the BMIG isopod scheme). The main aim of iRecord is to make it easier for wildlife sightings to be collated, checked by experts and made available to support research and decision-making at local and national levels.

Social media - BMIG has embraced some social media as a quick and easy way to post news and other information. It has been used by several people requesting identifications and serves as a place to notify of new species or publications. Principally:

Facebook: <https://www.facebook.com/BritishMyriapodandIsopodGroup> also

Twitter: @britishmigroup; <https://twitter.com/britishmigroup> and

Instagram: britishmigroup; <https://www.instagram.com/britishmigroup>

AND FINALLY

Recording the distribution and ecology of woodlice and waterlice is an esoteric pastime, but includes a willingness to share information among a community of like-minded people. In the course of 50 years more than 1000 individuals, throughout Britain and Ireland, have been motivated to contribute their records, observation and photographs to the recording scheme. Fortunately this behaviour is a well-established tradition in natural history in Britain and Ireland. In those 50 years the scheme has

continued to thrive through a considerable range of changes – long may it continue. So, the last words should probably be with the originator of the scheme, Stephen Sutton, who will celebrate his 80th birthday in 2018 – with a mind to the future “*per isopoda ad astra*”.

ACKNOWLEDGEMENTS

Stephen Sutton’s original idea for the scheme and John Heath’s early support for it at BRC provided a sound basis for the project. Gregory (2009) listed over 350 recorders that had contributed more than 10 records to the isopod scheme, from a list of more than 1000 overall contributors. These people have been the life-blood of the scheme and without them none of this could have happened. Of course, the individual scheme organisers have also been essential to the success of the scheme. I would also like to thank all the members of the BMIG Committee over the last 17 years for their enthusiasm and companionship, in particular Tony Barber, Steve Gregory, Paul Lee and Helen Read. I am especially grateful to Steve Gregory for comments on a draft of this paper and for his help in sourcing the photographs.

This review is a personal account based on my experiences of being involved with the scheme since 1968 (however peripherally). I am certain that other authors, or a consortium of contributors, would have brought different perspectives. It has not been possible to include full reference to the many people that have contributed significantly to the scheme and its continuing success. Sadly, some are now dead, including Colin Fairhurst, Steve Hopkin, John Metcalfe, Philip Moon, Eric Philp, Douglas Richardson and Bill Williams. Others have played a key role at various stages, including Keith Alexander, Roy Anderson, David Bilton, David Bolton, Martin Cawley, Arthur Chater, Glyn & Dawn Collis, Jon Daws, Declan Doogue, John Harper, Peter Harvey, Dick Jones, Paul Lee, Keith Lugg, Ian Morgan, Niall Reardon, Adrian Rundle, David Scott-Langley, Craig Slawson and Mark Telfer.

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