

particularly for *Pisidium* spp. Should the weather become unpleasantly hot it may be possible to continue to examine material indoors.

Meet at 10:30h at the bridge over the River Loddon on the A329 at the public footpath sign next to the petrol filling station (SU 766716), nearly opposite the multiscreen cinema. This will provide a brief opportunity to re-sample the site next to the bridge to see if there have been species changes since the 2007 floods. Or, for those coming by car, at 10:00h at Loddon Bridge Park and Ride (parking spaces have been reserved next to the small office) (SU 768717) signposted from the end of the A329M (first exit northbound after the M4 exits). This car park is behind, but separate from, the multiscreen cinema car park. For those coming by train the easiest station is Earley. Walk to the end of Station Road then turn left down Wokingham Road (A329) until the river is reached (about 20 mins). Please inform the leader if you intend to come.

There may be a short Council meeting during this meeting, if required.

YCS - Saturday 5 September
Walden Dale, VC65.
Contact: David Lindley
(0113 2697047) (home),
david.lindley3@btinternet.com

Meet at 10:30h in West Burton village centre by the village green, grid ref. SE 017866.

FIELD - Friday - Monday 18-21 September
Isle of Skye
Marine meeting
Leader: Shelagh Smith
(016977 42014) (home)

Accommodation should be sought in the Broadford area. Cottages on Skye tend to be small and are in very short supply, so if you are planning to attend this meeting, early booking of your accommodation is vital.

NHM - Saturday 3 October
11:00h in the Dorothea Bate Room [Palaeontology Demonstration Room]
Please note the revised start time. No Council meeting.

Please bring plenty of exhibits and demonstration material. There will be a lunch break at about 13:00h. Lecture to start at 14:00h.

The morning's activities will include exhibits and demonstrations on deep-water [shelf edge] marine molluscs and freshwater molluscs, and other options still at the planning stage.

Members are encouraged to bring specimens of any Mollusca for identification, a X20

binocular microscope will be available if needed.

Guest speaker at 14:00h
Luciana Genio (University of Leeds)
Recent researches on *Bathymodiolus* in NE Atlantic cold seeps

NHM - Saturday 17 October
11:00h in the Board Room of the Natural History Museum
Full day meeting of Council only

YCS - Saturday 17 October
Upper Nidderdale, VC64.
Contact: David Lindley
(0113 2697047) (home),
david.lindley3@btinternet.com

Meet at 10:30h in the car park in Pateley Bridge on the south side of the river, grid ref. SE 157654.

FIELD - Saturday 24 October
Nottinghamshire, Sherwood Forest area. Slug search
Leader: Chris du Feu
(01427 848400) (home)

WKSHP - Saturday 28 November
The annual workshop held in Woking offers Members the opportunity to receive tuition on identifying difficult groups.
Subjects: small marine bivalves and helicid land snails
Bookings to Judith Nelson. Tel: 01483 761210 (home)

NHM - Saturday 12 December
14:00h in the Dorothea Bate Room [Palaeontology Demonstration Room], preceded by Council meeting.

Guest speaker at 14:00h
to be announced

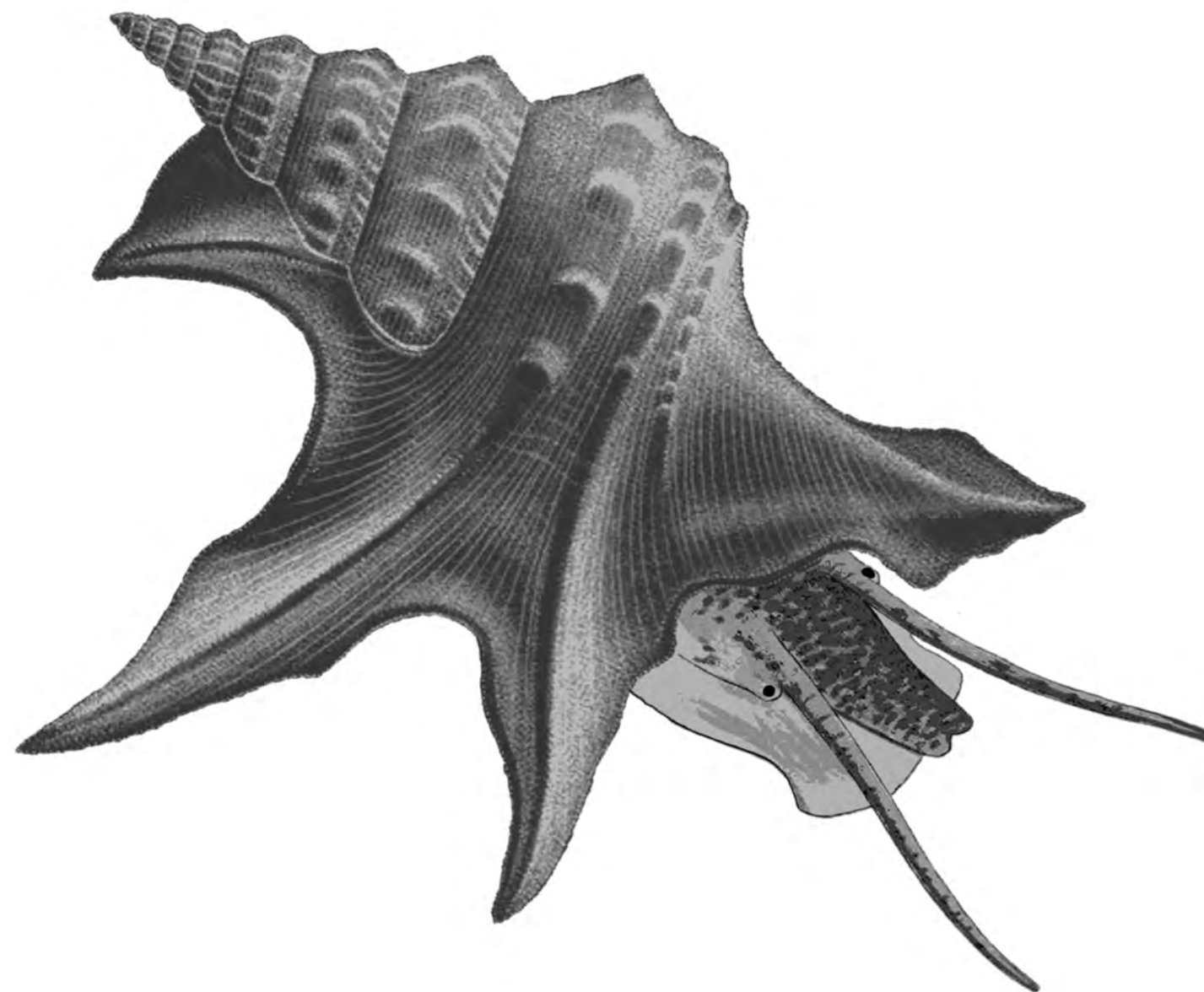
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Mollusc World

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THE MAgAZINE oF THE CoNCHoLogICAL SoCIETY oF grEAT BrITAIN & IrELAND

Editorial

This is my last issue as Editor of *Mollusc World*. I originally agreed to produce 9 issues, but have finally managed to escape after 19 issues! I would like to thank everyone who has provided contributions over the last 6 years or so, but I am especially grateful to the few members who have written articles on a regular basis, often at my request and with only a few days notice. I also thank Emma Pitrakou who has designed every issue of *Mollusc World* and is responsible for the attractive product we have today. Finally, my thanks to Peter Topley, who has proof-read most of the later issues. Peter will be taking over as the new Editor (see details below).

It has been a struggle to get enough copy for this issue, hence its lower number of pages than usual and its late publication date. Having said that, I hope you enjoy the variety of material in this issue, especially the 2 long articles from overseas members Alex Menez and Mike Murphy, and of course the whacky shell house in Ireland. With the production methods now used for the magazine we are able to include plenty of high quality photographs at very little additional costs – so don't feel that you have to skimp on these. Remember that they do need to be of reasonably good resolution (0.6-1.3mB is ideal), and other images must be at 300dpi. One of the most difficult parts of the role as Editor is getting material that is

topical, current and relevant to the interests of the readership. The Society's field meeting activities are well reported in *Mollusc World* but there is plenty of scope for additional items on the recording schemes and conservation. Everyone needs feedback to provide the stimulus for further effort.

Finally, please give Peter Topley your full support and provide him with plenty of interesting articles to enable us to continue and build on this high quality Society publication.

Ian Killeen

Mollusc World

This magazine is intended as a medium for communication between members on all aspects of Molluscs from archaeology to life in the sea, field collecting at home and abroad and even eating molluscs. If you look back on the content over the last three years we include articles, field meeting reports, research news, results from the mapping schemes and identification keys. We welcome all contributions in whatever form they arrive.

How to submit articles:

Copy (handwritten, typed or electronic) should be sent to the Editor at the address below. If sending electronic copy using e-mail please include a subject line "*Mollusc World* submission" and send a separate mail without any attachments advising that the e-mail was sent. Electronic submission is preferred in Microsoft Word, but if other programmes (e.g. Works) are used, please indicate the programme used with the accompanying e-mail.

Images and Artwork may be digitised, but we recommend that a digital image size no larger than 8" x 6" and 300 dpi be sent with your submission. For line art we recommend that you send hard copy, all originals will be treated with care and returned by "snail-mail".

Please send articles to:

Peter Topley, c/o The Hon. General Secretary, Miss R.E. Hill
447b Wokingham Road, Earley, Reading RG6 7EL
email: molluscworld@ntlworld.com

About the Society

The Conchological Society of Great Britain and Ireland is one of the oldest societies devoted to the study of Molluscs. It was founded in 1876 and has over 300 members worldwide. Members receive two publications *Journal of Conchology* which

specialises in Molluscan Biogeography, Taxonomy and Conservation and *Mollusc World*, our newsletter for members. New members are always welcome to attend field meetings and indoor meetings before joining.

How to become a member

Subscriptions are payable in January each year, and run for the period 1st January to 31st December.

Ordinary membership	£33.00
Family/Joint membership	£35.00
Institutional membership (UK & Ireland)	£47.00
Institutional membership (Overseas)	£50.00
Student membership	£15.00

Payments in sterling only, to membership secretary at address below. £1 discount given to payments before March 31st each year. For UK residents we suggest payment by standing order, and if a UK tax payer at standard rate we encourage you to sign a Gift Aid form.

Overseas members can pay by IBAN transfer to the following account:

The Conchological Society, National Westminster Bank,
Bolton, BL1 1BN

IBAN GB12 NWBK 0130 9906 5238 46 BIC NWBK GB2L

Contact: Mike Weideli, 35 Bartlemy Road, Newbury, Berks,
RG14 6LD

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FIELD MEETING

Phenacolimax major sites in SE Devon 14 & 15 March 2009 Keith Alexander

Phenacolimax major is an elusive species; its habits and ecology are poorly documented. A lot of time over the weekend was therefore spent discussing what we do know – or rather what we think we know – and whether this applied to the sites we were visiting. The known sites tend to be relatively undisturbed ancient woodlands, where humidity is maintained at a permanently high level by the presence of springs, wet seepages, and/or streams beneath a relatively dense canopy of broad-leaved trees, but where the ground is not subject to flooding. The sites also tend to be well-sheltered, out of the drying wind. The snails are found amongst moss, leaf litter and other debris on the soil surface, and often demand considerable search effort to locate. South-east Devon is one of the very few strongholds for the species known in Britain and was an obvious target area for Conch Soc's distributional project on the species. Eighteen sites are known in the county and this field meeting targeted three of these and also explored further afield.

Saturday was spent in the Teign Valley above Steps Bridge. Bridford Wood is the only known site in Dartmoor National Park – discovered here by Dave Bolton in 1992 - and so most of our time was spent here. A stream cuts down through the western end of the wood and has created a broad area of nutrient-enriched wet-flushed ground in otherwise dry acid oak woodland. After two hours of searching through the lower valley we only had a few possible *Phenacolimax* shells, all found by Rosemary Hill (and confirmed later). The presence of *Cochlodina laminata* is an interesting feature of the site – it is very localised in Devon and unexpected in the granite

woodlands of Dartmoor - and a few juvenile *Zenobiella subrufescens* also added some interest. A live *Vitrima pellucida* caused some initial excitement before its true identity was agreed. The profusion of wild daffodils provided an attractive backdrop to the search.

After lunch we explored further up the main river valley into Thomas Cleave Wood, but this proved a poor area, with a cold drying wind scouring down the side valley. An old stone ruin at the entrance to the valley was the main feature of interest found, as the walls had been colonised by *Merdigera obscura* – another surprise for a Dartmoor site; how does a lime-loving species manage to find a very isolated mortared wall? This area was sufficiently unrewarding however for us to return to the morning's locality and explore further up the stream valley – usefully extending into the neighbouring 10km square. Here we found springs with extensive areas of golden saxifrage *Chryso-splenium* and we managed to build up the site list by adding *Carychium tridentatum*, *Columella edentula* and *Deroceras laeve*. The spring-line area appears to have good potential for further specialist molluscs but we were running out of time and could not spend too long here.

Sunday's target was to check the two old East Devon AONB sites. These are very different in character to the Dartmoor valley, being goyles - steeply incised funnel-shaped stream gullies cut down through the local sandy strata and flint beds. We started in Lincombe Goyle on the west side of the Sid valley, where *P. major* was reported by Jean Paton in 1969. The goyle initially did not look too promising as the upper flanks



have been converted to conifer plantation, there was much cherry laurel and rhododendron on the goyle sides, and fallen trees had recently been cleared away for a shoot. Molluscs proved hard to find and so we decided to abandon the goyle and try the neighbouring Beacon Goyle. After struggling up the

land-slipped goyle sides however, Tom Walker managed to find a live *P. major* beneath a broken branch section lying in a shallow mossy boundary ditch immediately above the brow to the goyle. The old ditch presumably acts as a drainage runnel down into the goyle and keeps this elevated situation moister than might otherwise be imagined. Rosemary Hill also ponders about *Phenacolimax major*'s mobility – maybe it moves up and down the goyle sides depending on soil moisture and/or the threat of flooding? For its size it is a very mobile mollusc and it soon seeks out shelter if exposed in the open – for photography for example! Moving on to Beacon Goyle, we found more plantations and

rhododendron but without the recent disturbances from clearance of fallen trees. But, again, molluscs proved elusive. A mature *Zenobiella subrufescens* was found and a juvenile *Cepaea nemoralis* with *Arianta* colouring and a distinct but small umbilicus provoked some discussion of the key identification characters.

After lunch we visited the near-pristine Roncombe Goyle on the east side of the Sid valley. The old record here was from A. E. Boycott and may date back as far as the 1920s. We were very much aware of treading in historic footsteps! This goyle is similar in structure to the morning's sites, the deeply-incised gully cutting through sandy substrata and flint

beds down this time onto what appeared be a mudstone layer. The woodland vegetation here is very much semi-natural, and the structure relatively open through cattle grazing. The cattle do not however penetrate the stream channel cut into the bottom of the goyle as fallen tree trunks provide protection, and the old land-slipped sides are covered by mosses and liverworts as a result. The environment is very much one of shelter and humidity. Tom again triumphed with the discovery of a live *P. major*, soon followed by another found by Rosemary. While it is good to have rediscovered the species after a gap of around 90 years, the site has almost certainly not changed much over the intervening

period. However we did spot young growth of *Impatiens glandulifera* in places – probably introduced through road stabilisation works above the head of the goyle - and so the site is clearly about to change dramatically for the worse. Examination of a bag of leaf litter taken away for closer inspection provided a useful addition to the site list, with worn shells of *Acicula fusca*. One final comment from Rosemary, that both vitrinid species were smaller than she has collected on other occasions, perhaps because the cold winter had reduced feeding opportunities?

We are grateful to Mick Jones, NT Warden, for permission to investigate Bridford Wood, to Sir John Cave for the two eastern goyles, and to Mr Smith for Roncombe Goyle.

Species recorded	Bridford SX801881	Bridford SX799879	Thomas Cleave SX796885	Lincombe Goyle SY127936	Beacon Goyle SY124933	Roncombe Goyle SY166943
<i>Acanthinula aculeata</i>				L		
<i>Aegopinella nitidula</i>		L	L			L
<i>Aegopinella pura</i>	L	L		L		
<i>Acicula fusca</i>						S
<i>Ancylus fluviatilis</i>	L					
<i>Arion ater</i>	L	L		L		
<i>Arion distinctus</i>			L			
<i>Arion fasciatus</i>			L			
<i>Arion flagellus</i>			L			
<i>Arion owenii</i>		L	L	L		
<i>Arion rufus</i>	L					
<i>Arion subfuscus</i>	L	L	L	L	L	L
<i>Balea heydeni</i>					L	L
<i>Balea perversa</i>						S
<i>Carychium minimum</i>						L
<i>Carychium tridentatum</i>		L		L		
<i>Cepaea hortensis</i>			L			
<i>Cepaea nemoralis</i>	L		L	L	L	L
<i>Clausilia bidentata</i>	L	L	L	L		L
<i>Cochlicopa lubrica</i>	L					L
<i>Cochlodina laminata</i>	L					
<i>Columella edentula</i>		L				L
<i>Cornu aspersum</i>						L
<i>Deroceras laeve</i>		L		L		
<i>Deroceras panormitanum</i>	L					
<i>Deroceras reticulatum</i>	L					
<i>Discus rotundatus</i>	L	L	L	L	L	L
<i>Euconulus fulvus</i>	L				L	L
<i>Galba truncatula</i>	L					
<i>Lehmannia marginata</i>	L	L		L	L	
<i>Merdigera obscura</i>			L			
<i>Nesovitrea hammonis</i>					L	
<i>Oxychilus alliarius</i>	L	L	L		L	
<i>Oxychilus cellarius</i>	L					
<i>Oxychilus helveticus</i>	L			L		L
<i>Phenacolimax major</i>	S			L		L
<i>Punctum pygmaeum</i>				L		
<i>Trochulus hispidus</i>	L					L
<i>Vitrea crystallina</i>	L	L				L
<i>Vitrina pellucida</i>	L	1		L		L
<i>Zenobiella subrufescens</i>	L				L	

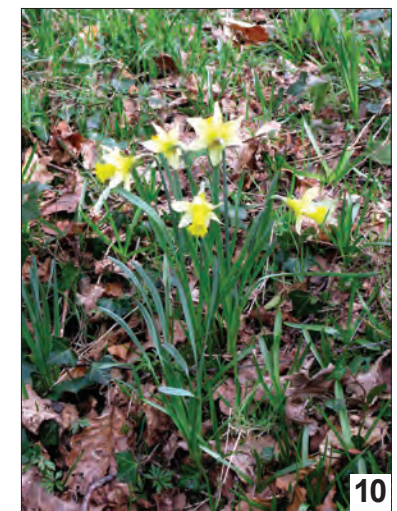


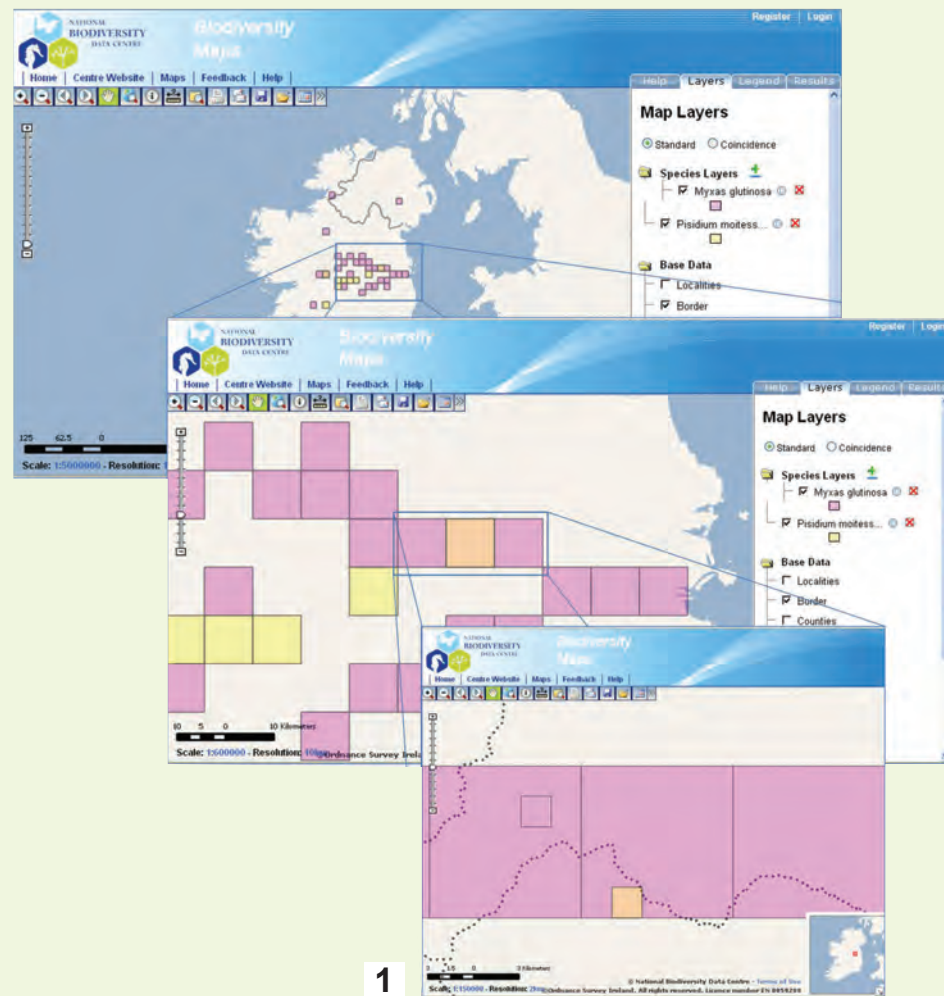
Photo captions

- Fig 1** Ron Boyce searching for *Phenacolimax major* in Bridford Wood
- Fig 2** Tom Walker, Rosemary Hill and Ron Boyce debating the habitat requirements of *Phenacolimax major* at the unusual site by Lincombe Goyle
- Fig 3** Tom Walker examining a *Phenacolimax major*
- Fig 4** Waterfall in Bridford Wood
- Fig 5** *Oxychilus helveticus* in Bridford Wood
- Fig 6** *Phenacolimax major* in Roncombe Goyle

- Fig 7** *Discus rotundatus* scavenging calcium from a skull in Lincombe Goyle
 - Fig 8** Tom Walker in Roncombe Goyle
 - Fig 9** Rosemary Hill in Roncombe Goyle
 - Fig 10** Daffodils in Bridford Wood
 - Fig 11** Tom Walker in Beacon Goyle
 - Fig 12** Keith and Tom find a skull with snails on in Lincombe Goyle
 - Fig 13** Stream in Bridford Wood
- Photos 1-3 Keith Alexander
Photos 4-13 Ron Boyce and Rosemary Hill

The All-Ireland Non-Marine Molluscan Database – a digital repository and online resource for molluscan recording

Andrew Byrne, Evelyn Moorkens, Roy Anderson, Julia Nunn, Liam Lysaght and Eugenie Regan.



1

There is a wealth of records for the non-marine mollusca of Ireland due to the great efforts of amateur and professional conchologists and malacologists for the last two centuries. Much of these records have been held and maintained by the Conchological Society of Britain and Ireland in paper formats. However, there are many records held in other mediums by different groups and individuals within the island of Ireland, including the National Parks and Wildlife Service (NPWS), the Heritage Council, the Centre for Environmental Data and Recording (CEDaR) and other

published and unpublished records. A project was undertaken in Ireland to digitise and capture as much data as possible on this group, populate a database with these data and dynamically display the results online via a mapping system. This is the first time in Ireland that all the data on this group will be centralised and data managed as a unit. It also is a very important digital repository for records; a 'bank' in which records are stored and safeguarded for future generations. Data has been sourced, digitised and data cleaned over the period since December 2007. The dataset was

uploaded on the mapping system on 20/01/2009 [Note: Not all data has been displayed on the mapping system thus far: *Margaritifera* sp. records have been omitted due to their sensitive nature. Species with new taxonomic nomenclature and certain aggregate groups are also not currently displayed, but will be in the near future]. There are 149 species of mollusc mapped, from 2,446 sites, with a total of 46,615 records that range in date from 1842 to 2007. The database can be interrogated through the National Biodiversity Data Centre's online mapping system (maps.biodiversityireland.ie). The database is currently on a beta test; permitting the database to be accessed online in a testing phase allowing validation and feedback from experts and end-users (users comments are welcome).

Demonstration of viewing molluscan data using the mapping system

Images of the mapping system are shown here to demonstrate the functionality of this system for displaying and interpreting molluscan data. Firstly the database was queried for two species of conservation interest, *Myxas glutinosa* and *Pisidium moitessierianum*, both of which appear on conservation assessments for Ireland (Bratton, 1991 in Kerney, 1999; Moorkens, 2006). *Myxas glutinosa* has had widespread losses across its range in Northern Europe with documented population extinctions (Kerney, 1999; Bouchet et al., 1999). *Pisidium moitessierianum* was considered extinct in Ireland (Kerney, 1999) until it's rediscovery in

2003 in the Royal Canal (Killeen and Moorkens, 2003). It has been considered endangered in Ireland and is in decline across much of its native range (Moorkens, 2006). The distributions for each of the species were mapped together, using the online mapping system on the island of Ireland scale (Figure 1). The midlands-east region of Ireland is focused on for the purposes of this demonstration. The mapping system allows one to view records against different GIS (Geographic Information System) layers (for example, localities, designated areas etc.), in this case the records are viewed against the counties of Ireland layer (Figure 1).

The 'zoom in' tool was then used to view the records in the 1km square that the two species co-occured. Some records had high resolution (100m or higher) and so the mapping system displayed the records at this resolution. At these higher resolutions the Discovery Series Ordnance Survey layer cuts in, showing that the records are actually from around Kilmore Bridge, Co. Kildare (Figure 2). Zooming further in reveals the aerial photograph layer of the site. Due to the fact these species are considered rare and endangered in Ireland, it was queried to see if the area was protected in anyway (Figure 2). The records were, at least, partially in proposed Natural Heritage Areas (pNHAs), though it is possible that the species may have been recorded just outside of the protected boundary.

We hope this resource will be used by (and useful for) recorders and encourage, and enthuse, people to study and be interested in this important part of Ireland's fauna. We also hope that the database, as a repository, will be utilised as a safeguard of valuable biological information for generations to come.

Acknowledgements

We would like to thank the funders of this project, National Parks and Wildlife Service and the Heritage Council. We also would like to thank key collaborators: the Conchological Society of Britain and Ireland, Centre

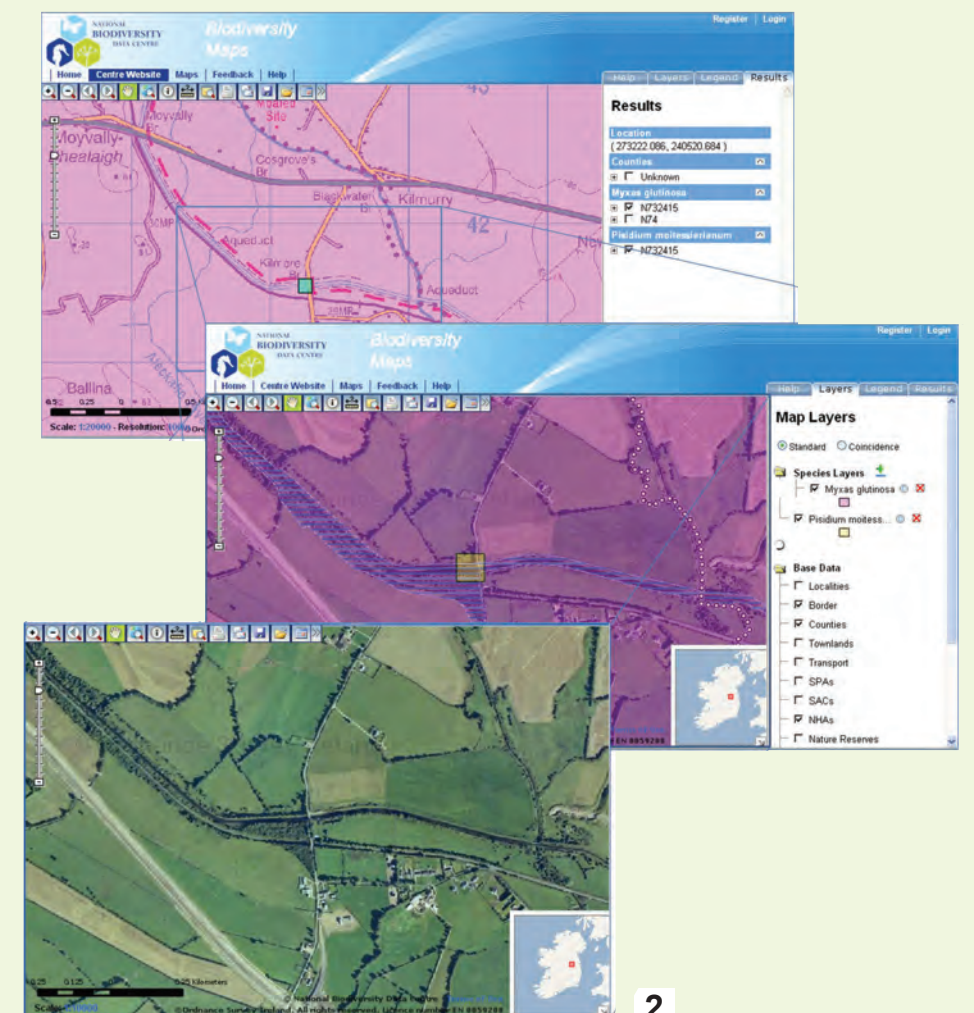
for Environmental Data and Recording (CEDaR) and all the recorders of the non-marine mollusca of Ireland, without their work this resource would not exist.

References

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Figure 1: The distribution of the 51 records for *Myxas glutinosa* and the 16 records of *Pisidium moitessierianum*. At low resolutions the records are shown as 10km squares. At higher resolutions the records are shown either at 1km square or the level at which the record was taken. Purple = *M. glutinosa* yellow = *P. moitessierianum* orange = both species.

Figure 2: The distribution of the records for *Myxas glutinosa* and *Pisidium moitessierianum* from Kilmore Bridge at 100m resolution. Both species co-occur at the same site and they are selected in the first view. The NHA GIS layer is selected in the second view. Turning off the species layers allows the end-user to view the site's aerial photograph alone (third view). Blue/yellow = co-occurrence of species.



2

The publication of Biotir 2 The Landsnails of Madeira: An illustrated compendium of the landsnails and slugs of the Madeiran archipelago provides an end to the project on Landsnails of Madeira. It provides the first full colour illustrated guide to identification of landsnails on the Madeiran Islands. This fauna is well-known in a European context, as it has a high percentage of range restricted endemic species. The provision of range maps using Museum survey data, and Museum collection data (Coles, Cameron, Holyoak-Seddon and Melvill-Tomlin Collection) as well as an assessment of the species conservation status using IUCN categories and criteria will provide the conservation authorities on Madeira with a sound base for future assessment work.

ORDER FORM

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The Paua shell

Adrian Sumner



1

Few people who have visited New Zealand can have failed to notice paua shells or the artefacts made from them. The paua (pronounced *pa-wa* or *pah-wah*) is a large ormer or abalone, *Haliotis iris*, found all round the coasts of New Zealand, where it is endemic. The best specimens are said to come from the south of South Island and from around Stewart island. This species is also known as the blackfoot paua. There are two other species of *Haliotis* in New Zealand, the Queen Paua, *Haliotis australis*, also known as the Silver Paua, Yellow Foot Paua, Hihwiwa or Karariwha, and the Virgin Paua, *Haliotis virginea*, but these are less common and do not appear to be commercially important. A large blackfoot paua can be as much as 6 inches (150 mm) long, and so contains plenty of meat, but it is for the blue-green iridescence of the inside of the shell (Figure 1) that the paua is especially prized (<http://en.wikipedia.org/wiki/Paua>).

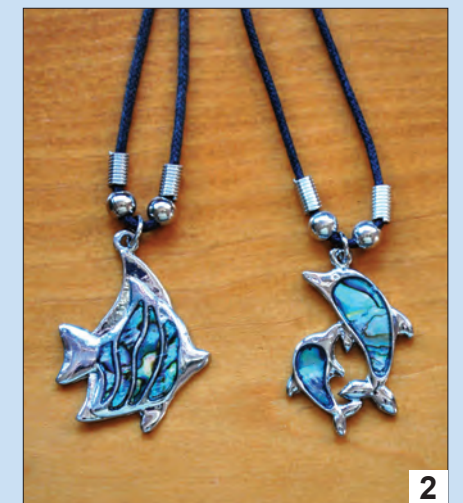
According to Maori legend, the paua originally had no shell. Tongaroa, the Maori god of the sea, noticing that this caused problems for the paua, made a covering, using blues from his own ocean, and asking his brother Tane, god of the forest, to add greens; the dawn was to provide violet, and the sunset pink. However, this layer was rather fragile, and so Tangaroa added many more layers to the shell to make it stronger and to camouflage it. The meat is esteemed as a delicacy by the Maori, who serve it on special occasions such as weddings, and the iridescent shell was used to make the eyes on their exquisitely carved wooden figures, and on their canoes.

Today, the paua fishery is the fifth largest in new Zealand, worth NZ\$ 50 million a year. The meat is eaten not only in New Zealand, but is also exported to Asia, where it is in great demand. Many recipes are available on-line from the New Zealand Abalone Farmers' Association (<http://www.nzafa.org.nz/recipes>). The shells are largely made into jewellery (Figure 2), but are also used for a variety of decorative inlaid work, and indeed almost anything you can think of, including ornamenting wedding dresses! To prepare the paua shell for use, the outer

layers (which are usually covered with a variety of other marine organisms) are ground away until only the blue-green nacre remains, and it is this thin layer that is used. This can be done by hand, using progressively finer grades of abrasive paper, but commercially this process is carried out by machines. John Llewellyn-Jones has previously described this industry in detail in an article in these pages (*Mollusc World* No. 2, pp. 20–21, 2003), to which the reader should refer for more information.

Exploitation of paua is controlled by law. The shells can only be obtained by diving without breathing apparatus, and the commercial catch is limited to between 1000 and 1100 tons a year. For recreational fishermen, the number of shells collected must not exceed ten per person per day, although lower limits are applied in some places. Regular assessments are carried out by the Ministry of Fisheries to ensure that the fishery is sustainable (<http://www.fish.govt.nz>). Needless to say, with such a valuable product, which is easy to catch, unscrupulous criminal gangs break the law and take excessive numbers of paua using artificial aids for diving, and it is estimated that the illegal catch may be as great as the commercial catch of paua. Much of the illegal catch is exported to Asia. From time to time illegal paua fishermen are caught and face fines of up to NZ\$ 250,000 and/or 5 years in prison. Recently, sniffer dogs have been trained to detect paua shells, in an attempt to reduce the illegal exploitation of paua. However, New Zealand has a long coastline, much of it remote, and it is difficult to patrol it adequately.

To improve the sustainability of the paua fishery, paua farms have been set up. Aquaculture of paua started in the 1980s, and is still on quite a small scale, with only 14 farms operating in 2008, producing 10–15 tons of abalones a year. However, this is expected to rise to 300 tons in the next 10 years or so, making the industry valued at NZ\$ 20 million (<http://www.nzafa.org.nz>). One can only hope that initiatives such as this will counteract the effects of over-exploitation, and that future generations will still be able to enjoy this beautiful shellfish.



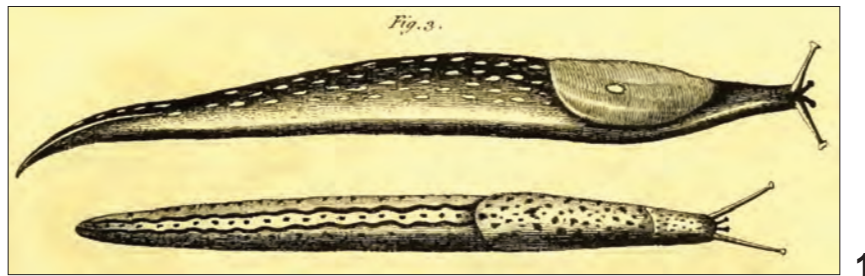
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Figure 1. The inside of a paua (*Haliotis iris*) shell from Stewart Island, New Zealand.
 Figure 2. Paua shell jewellery.

An eighteenth century description of the mating of *Limax maximus*

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The well-known and often photographed mating of the slug *Limax maximus* takes place whilst a couple is suspending itself with mucus from an elevated point, commonly a tree branch or a wall (Örstan, 2008). Adams (1898) published the first detailed description of this process, although there were a few earlier and shorter accounts of it, the very first one apparently being that of Martin Lister published in 1678 (Isabel Hyman, in litt.).

Recently, during a search of Google Books (<http://www.books.google.com>) for the occurrences of the phrase “limax maximus”, I discovered a description of the mating of that species in James Barbut’s *The genera Vermium exemplified by various specimens of the animals contained in the orders of the Intestina et Mollusca Linnaei*, published in London in 1783. As far as I can tell, Barbut’s account of the mating of *L. maximus* has not been noted before.

Barbut’s 101-page book is bilingual with each page carrying text both in English and French; in addition, brief descriptions of the orders and genera are given in Latin. Scattered throughout are 11 plates of illustrations drawn by Barbut as noted on the cover of the book. Barbut’s description of the genus *Limax*, closely following the original of Linnaeus (1758), is as follows:

“The body is long, creeping; has over it a kind of buckler made of flesh; underneath a longitudinal flat disk.

There is a hole on the right side, for the genitals and evacuations. The feelers are four in number, placed above the mouth.”

The “buckler” is, undoubtedly, the mantle, but it is not clear if the “longitudinal flat disk” refers to the internal vestigial shell of the slugs in the genus *Limax* or to the sole of the foot. Linnaeus’s corresponding statement was also equivocal. The hole on the right side that Barbut (and Linnaeus before him) observed was most likely the conspicuous pneumostome, the breathing hole that is visible in Barbut’s drawing of *L. maximus* (Figure 1). The openings of the rectum and the ureter are next to it, but the genital opening is separate and closer to the front of the head and is normally kept closed except during mating (Figure 2). The misidentification of the pneumostome as the genital opening was an oversight of Linnaeus that Barbut perpetuated.

This is how Barbut outlined the mating of slugs:

“Their coming together is towards the end of spring. The organs of generation are placed, as in the snail, on the right side of the neck. The male implement unfolds with the same mechanism, as the finger of a glove when turned inside out. They are sometimes met with hanging in the air with their heads downwards, their tails united by a kind of viscous and thick tie, are grappled to the branch of a tree. In this situation they remain for three hours, and that is the

instant of impregnation.”

Barbut also gave brief accounts of the four species of slugs that were known from Great Britain at that time and which Linnaeus had described in 1758. These were *Limax ater* (now *Arion ater*), *Limax rufus* (now *Arion rufus*), *Limax maximus* and *Limax flavus*. Although Barbut did not specify which of those four slug species mated in the manner he described, we can deduce that his description was for *L. maximus*, because unlike *L. maximus*, the two *Arion* species and *L. flavus* all mate on the ground (Quick, 1960).

Barbut’s brief description of the eversion of a slug’s penis is remarkably accurate. Moreover, whilst discussing *L. ater*, he states correctly that “it is an [sic] hermaphrodite, both sexes being in each individual, and both in the coitus impregnate, and are impregnated, at the same time.” However, Barbut did not state if these were his original observations or were taken from the literature.

A search of the Internet for biographical information about Barbut revealed only one relevant source, Damkaer’s *Copepodologist’s Cabinet* (2002). Damkaer, however, had very little to say about Barbut:

“I am surprised that there is apparently no substantial biographical material about Barbut. Even the *Dictionary of National Biography* has no entry...The date of Barbut’s death is from the library catalog of the Wellcome Institute. Barbut’s (1783) preface, in which he states that he would appreciate specimens from anyone, gave his home as ‘Walcot Place, Lambeth,’ likely a London district.”

Damkaer could not determine Barbut’s birth year and gave his death year tentatively as 1791. Barbut appears to have been an enthusiastic

naturalist and a talented scientific illustrator. Although his works have survived, he himself has unfortunately become an unknown.

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Angliae tres tractatus. Unus de Araneis. Alter de Cochleis tum terrestribus tum fluviatilibus. Tertius de Cochleis marinis. Quibus adjectus est quartus de Lapidibus ejusdem

insulae ad cochlearum quandam imaginem figuratis. (<http://tinyurl.com/7r4mdn>)

Örstan, A. 2008. *Limax maximus* mating—part 2. *Snail’s Tales*, 14 February 2008. <http://tinyurl.com/2shmf7>

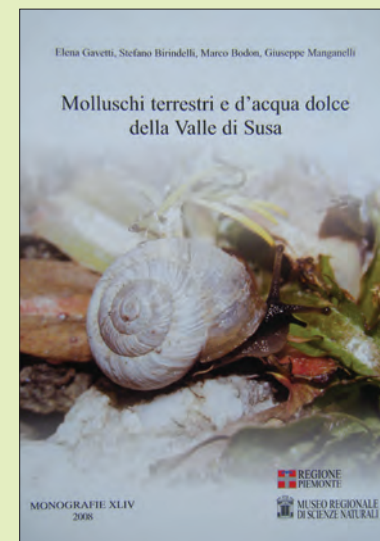
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Figure captions:

Figure 1: *Limax maximus* from Barbut’s Plate III.

Figure 2: A pair of *Limax maximus* mating on the trunk of a pine tree in Maryland, USA. The separate locations of the genital opening out of which the penis

was everted and the pneumostome, the large hole to the right of the former, are clearly visible along the right side of the head of the slug in the back.



Molluschi terrestri e d’acqua dolce della Valle di Susa

Elena Gavetti, Stefano Birindelli, Marco Bodon & Giuseppe Manganelli. Regione Piemonte Museo Regionale di Scienze Naturali Monografie XLIV 2008. Hardback with dustcover, 273pp. In Italian. ISBN 978-88-86041-71-3. Price €50 + postage.

This work presents the results of a 10 year study to map the mollusc fauna of the Susa Valley. The valley lies mostly in north-west Italy (with the city of Turin to the east) but with some parts in France in the Departments of Savoie and Hautes-Alpes. The

actual area of the catchment does not appear to be given but is approximately 100km long and 20km wide, and ranges from 290 to 3400m in altitude. The authors have collected information from nearly 400 locations in the valley.

Introductory sections give information on the geography, geology and vegetation cover of the study area supported by coloured maps, plus materials and methods. The bulk of the book is taken up with accounts of the 159 species recorded – comprising 121 terrestrial and 38 freshwater species. The page for each species comprises a synonymy, distribution map, details of habitat, distribution and observations, plus a colour photograph. The distribution maps are particularly effective as the symbols are shown

in colour on colour relief maps. Therefore the discrimination between, for example, valley floor and higher altitude species is immediately obvious without any cross referencing back to maps elsewhere. One has come to expect very high quality close up images in any work these days and those used in this book are, on the whole, no exception. A considerable number of the photographs are of living, crawling snails, those for the *Chilostoma* species and clausilids are especially beautiful. Many of the smaller species are shown only as shells although the live *Pagodulina austeniana* is exquisite. The photographs of the unionids with their foot out trying to bury in wet sand doesn’t work so well though. The conclusions sections include an analysis of the fauna, analysis from ecological and biogeographical perspectives and conservation.

It would be easy to suggest that the results from this type of study is easily disseminated through local and national record centres and web sites, but most of us involved in any biogeographical study would be thrilled to have a work such as this as the end product. The book is well presented, beautifully produced and at €50 is good value. Anyone working on the biogeography of European non-marine molluscs should buy a copy and enjoy! For further details contact: anna.grassini@regione.piemonte.it

Collecting and eating snails in Morocco

Alex Menez



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In November 2008 I formed a part of a team that carried out biological work in Morocco. This was the last fieldwork trip carried out as a part of the GIBMANTUR campaign, an Interreg IIIA Gibraltar-Morocco project run by the Gibraltar Ornithological & Natural History Society and the Institut Scientifique of the University Mohammed V Rabat-Agdal, co-funded by the European Union and the Government of Gibraltar. During the two week trip I collected at 63 locations and amassed a very large amount of material, both live and dead. Morocco is a very interesting place for the malacologist. It lies in the West Mediterranean and West Saharo-Arabian biogeographical regions and has high species diversity and high rates of endemism. Morocco has a complex geology with four main physiographic regions:

1. An area of highlands paralleling the Mediterranean coast (Er Rif);
2. The Atlas Mountains (Moyen Atlas, Haut Atlas and Anti-Atlas) extending in a south-western to north-eastern direction between the Atlantic Ocean and Er Rif from which the mountains are separated by the Taza Depression;
3. The Atlantic Coastal Plain along the Atlantic Ocean located in an arc formed by the Er Rif and Atlas Mountains;
4. The Plains and Valleys south of the Atlas Mountains. These merge with the Sahara in the southeast.

The climate is generally Mediterranean-subtropical with cooling Atlantic and Mediterranean breezes. There is considerable fluctuation in the interior with cold winters and hot summers. Temperatures may drop below zero in the Atlas Mountains with snow on mountain peaks during most of the year. The south and southeast desert regions become very hot during the summer.

Morocco is of great interest biogeographically and ecologically because of its key location between the rest of the African continent and Europe. There are many floral and faunal similarities between southern Iberia and the Mahgreb region, which includes Morocco. Some species have relict distributions as a result of the previous continuity of the Betics-Rif mountain chain running from southern Iberia to North Africa, and subsequent vicariance events. Existing evidence for this continuity has recently been substantiated by plate reconstructions that indicate late Cretaceous-Palaeogene congruence between African and European plates. During the Tertiary the western Mediterranean was involved in a series of events caused by the interactions of the African and European Plates. The eastern movement of the African Plate during the Oligocene or Lower Miocene caused detachment of the western portion of the Alpidic Chain and its fragmentation into a series of micro-plates which subsequently moved in various directions in the Mediterranean, some towards North Africa, the Kabylas (Algeria), Italy (Calabro-



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Peloritan), Corisca and Sardinia.

The Strait of Gibraltar separates the Iberian fauna from the Mahgreb and has been a geographic barrier for gene flow during the last 5 million years. The Miocene desiccation of the Mediterranean Basin (the Messinian Salinity Crisis) resulted from the closing of the Strait 5.96 million years ago creating land bridges which may have allowed exchange between the Iberian and Mahgrebian faunas. There is evidence that these geological changes may have led to vicariance and subsequent genetic differentiation. There is a lot of opportunity for new work for the malacologist. A revision of many of the molluscan taxa is required to accurately assess diversity and systematic status. Many problematic taxa exist and there is much synonymy in the early literature. Most of the published literature on the land mollusca of Morocco dates back from the 1870s to 1930s. During the 1980s Mary Seddon and colleagues, from the National Museum of Wales, undertook mapping work in Morocco (as well as Algeria and Tunisia) and several papers were published, mostly on taxonomic and distributional aspects of their research. Very few papers have been published on the Moroccan land molluscs in the last 10-15 years, and no biogeographical treatment exists.

Our fieldwork trip took in the three Atlas ranges, south and south-western Morocco as well as parts of the west coast. I collected enough material to keep any malacologist sorting, identifying, synthesising and studying for years!

Some of it may represent new species as well as material rarely collected live before. I collected a lot of *Theba* including the polytypic *T. subdentata* (Férussac, 1821). Live material of *T. pisana ampullacea* (Pallary, 1915) was collected at Souss-Massa and *T. subdentata helicella* (Wood, 1828) was recorded from several localities including Cap Ghir and Essaouira. At Cap Ghir the subspecies occurs sympatrically with *T. subdentata dehnei* (Rossmässler, 1846), both present in high abundance as death assemblages although live material was scarce. Live *T. subdentata helicella* were found attached to *Euphorbia* spp. Fossil *T. subdentata helicella*, and other helicid, material was found 5km north from Cap Ghir in consolidated sand deposits (these require dating to verify age).

The live material collected from this trip, all preserved in ethanol, will help solve a '*Theba* mystery'. This is the highly disjunct distribution of *T. subdentata helicella*. The species has been recorded from coastal areas in west Morocco, from Tensift (about 30 km south of Safi) south to Cap Ghir, and from Almeria, southeast Spain. Material in the former Altimira collection from El Alquíán in Almeria prompted Gittenberger and Ripken to search for live material. They did not find the species and concluded it may once have been introduced into southern Spain, but had since become extinct. During recent fieldwork at Retamar, Almeria, however, I found the species at low abundance. Further fieldwork at El Alquíán, Almeria, led to my finding the species at densities of up to about 50/m². The re-discovery of this species at high density adds to the records of Puente *et al.* and Moreno and Ramos. The material from Cap Ghir and from El Alquíán will be used to study genetic similarities between these populations to assess degree of relatedness, probable timing of divergence event(s) and evolutionary outcomes, and so provide a better understanding of the species' distribution.

Other genera collected include: *Rumina*, *Cochlicella*, *Otala*, *Pseudotachea*, *Sphincterochila*, *Tingitana*, *Trochoidea*, *Xeroleuca*, *Hygromia* and *Helicopsis*. I have been able to identify some of the material; some species occurring in southern Iberia also, an area I have worked for many years. A lot of it, though, will be challenging and I plan to take advantage of Mary Seddon's offer to use the Cardiff collections for



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comparisons. I also spent a little time looking at the collections in the Mohammed V Rabat-Agdal University and I plan to return there to do more detailed work. The collections have not been studied for many years and there's a possibility that some of the original Pallary material may be there.

Another part of my malacological activities included eating some of my research subjects! Whilst in Marrakech I sampled the excellent cooked snails offered by the vendors in the main marketplace. The snails are prepared in a lighter sauce than commonly available in southern Spain, although the Moroccan sauce is slightly more spicy. I asked several of the vendors where they sourced their snails, but they were guarded as to revealing localities. Even though one of the vendors told me these were

collected locally, the large numbers sold, however, could not, I think, be sustained from wild populations. Morocco is one of the world's largest exporters of snails, and a significant number are exported to southern Spain to keep the snail-hungry Spaniards in supply. I suspect, therefore, that heliculture is keeping the vendors in Marrakech in business. But this is yet another Moroccan malacological question that requires further research to answer!

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Photo caption

- 1 Souss Massa, where live *Theba pisana ampullacea* (Pallary, 1915) were found on vegetation. (photo: A. Menez/GONHS).
- 2 *Theba subdentata helicella* (Wood, 1828) on *Euphorbia* sp. at Cap Ghir. (photo: A. Menez/GONHS).
- 3 Fossil *Theba subdentata helicella* (Wood, 1828) from deposits 5km north of Cap Ghir. (photo: A. Menez/GONHS).
- 4 A part of the collections in the Mohammed V Rabat-Agdal University, Rabat. (photo: L. Linares/GONHS).
- 5 The author, ready for fieldwork on the plains of M'Cissi. (photo: L. Linares/GONHS).
- 6 All a part of serious malacological research: the author tucking into juicy helicids in the main market at Marrakech (photo: I. Thompson/GONHS).
- 7 You need to take a little extra care in Morocco when looking for snails under stones. A large black scorpion in Sidi Quasik. (photo: L. Linares/GONHS).
- 8 Not everything you find with a shell in Morocco is a snail! This tortoise was photographed at Tiznit, but they were present at several of the sites visited (photo: A. Menez/GONHS).
- 9 An example of one of the many wonderful areas sampled: *Euphorbia-Argania* habitat in Tighmi. (photo: A. Menez/GONHS).

BIOTIR 3
The New Molluscan Names
of
César-Marie-Felix Ancey
 including illustrated type material from the
 National Museum of Wales
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The New Molluscan Names of César-Marie-Felix Ancey
 including illustrations of type material from the National Museum of Wales

Ancey (1860-1906) was a keen land and freshwater snail collector who principally focused on snails from the Hawaiian Islands, Central Asia, North and South America, Europe and Africa. In his short life he published many new taxa and greatly contributed to the conchological community.

Following Ancey's death, lists of his many publications and published taxa were produced, however, these were incomplete. This publication expands upon this previous work and provides a fully researched definitive list of Ancey's publications and his introduced new molluscan names.

Ancey's material is widely distributed in museums around the world, including the Melvill-Tomlin collection at the National Museum of Wales (NMW) in Cardiff. This publication illustrates all of the NMW material and, where known, indicates where other type material can be located.

- Full biography
- 176 published papers
- 762 new molluscan names
- 153 illustrated type lots on 26 colour plates

The Shell Cottage, Carton Estate, County Kildare, Ireland *Evelyn Moorkens*



There are a number of examples of the use of shells as interior decoration, but the Shell Cottage at the Carton Estate must be one of the finest examples of its kind.

The history of Carton Demense spans more than 800 years, it was given to the FitzGerald family in 1170 following the capture of Dublin by the Normans. The magnificent Carton House was built in the early 18th Century and the house and estate now hosts a prestigious hotel and two of Ireland's best parkland golf courses.

In 1747 James FitzGerald, the 20th Earl of Kildare married Lady Emily Lennox, daughter of the Duke of Richmond and great-granddaughter of the English King Charles II. The pretty shell cottage was built for Lady Emily. It originally had a thatched roof, but nothing from the outside could hint at the amazing décor inside. The centerpiece is a beautiful dome lined with thousands of tropical shells of every size. The walls, windows and furniture are all patterned with shells. While Carton House has had many famous residents and guests over the centuries, the shell cottage has made an interesting home also; one resident over the years was the singer Marianne Faithful.



A field survey of the molluscs of the Pilliga Scrub in semi-arid inland New South Wales, Australia

Michael J. Murphy

Coonabarabran, New South Wales, Australia

The Pilliga Scrub (30° 45' S, 149° 15' E) is a vast 450,000 hectare (1.1 million acre) area of semi-arid eucalypt and cypress pine woodland in *Gamilaraay* Aboriginal Country in inland northern New South Wales, Australia. The landform ranges from low sandstone ridges and hills separated by wide sandy valleys in the east to an extensive flat outwash sand plain in the west and north. The Pilliga is a harsh environment for molluscs. The sandy soils are poor in nutrients. Rainfall is infrequent and irregular and streams are dry for most of the year. Summers are hot (often up to 45° C), with frequent intense bushfires initiated by dry thunderstorms.

A field survey of aquatic and terrestrial molluscs in a 9,674 km² (3735 sq mile) study area, comprising the entire Pilliga Scrub as well as farmland, towns and villages in the local area, was started in 2006 and is ongoing. To help readers appreciate the scale of this study area, it is larger than North Yorkshire or the combined area of Norfolk and Suffolk in England, larger than the combined area of Powys, Ceredigion and Carmarthenshire in *Cymru* (Wales) and larger than the combined area of County Cork and County Waterford in *Eire* (Ireland). Very little work on the molluscs of the Pilliga had been done prior to this survey.

Molluscs have been sampled at

253 sites across the study area to date, sampling the range of habitats present. Survey methods for land snails and slugs involved hand searches of leaf litter, turning fallen timber and other ground debris, collection of leaf litter and soil samples for searching under magnification, and occasional searches with a torch on wet nights looking for active animals. Some snails were also found during fire-fighting work, when the ground litter was completely burned away. Survey methods for aquatic species primarily involved searching along the dry beds of streams and lagoons (including under debris), and occasional searching along the margins of water bodies.

The mollusc fauna of the Pilliga was found to be richer than expected for such a harsh, dry area. Four bivalve species (two families), 10 species of freshwater snail (six families) and 23 species of land snail and slug (11 families) have been recorded so far (see Table 1). The greatest contributors to this diversity are the Hyriidae (3 species), Planorbidae (4 species), Pupillidae (7 species) and Camaenidae (4 species). Records of particular interest include the following:

- The hyriid mussel *Velesunio wilsonii* (found at 3 sites) is a northern Australian species and has been recorded only once before in New South Wales (Jones 2007).
- The identity of the viviparid *Notopala* sp. (found at 4 sites)



1



2



3

was uncertain and may represent an undescribed species (Ponder pers. comm.). *Notopala* species in general have suffered a serious decline in southern Australia due to sensitivity to human-induced changes to riverine environments (Ponder and Walker



4



5



6



7



8

2003), and are close to extinction in New South Wales.

- The planorbid *Bayardella cosmeta* (recorded once) is a cryptic and seldom-recorded species with few recent records in New South Wales (Ponder et al. 2000).
- Records of the pupillid *Pupoides myoporinae* from the western Pilliga (7 sites) represent an easterly range extension of about 1000 km (620 miles) for this arid zone species (Shea pers. comm.).
- Charopid species A was unknown prior to this study and awaits formal description and naming (Shea pers. comm.).
- Records of the introduced *Bradybaena similaris* and *Vallonia excentrica* are the most westerly records of these species in New South Wales (Shea pers. comm.). Introduced land snails and slugs were restricted to anthropogenic moist microhabitats available in domestic gardens and urban and agricultural waste ground, and did not extend into the drier natural areas. Two native species, the pupillid *Gastrocopta strangei* and the punctid *Paralaoma caputspinulae*, also form part

of the Pilliga's 'domestic garden' land snail assemblage.

The survey so far has revealed differences between the mollusc assemblages of the rugged sandstone country of the east Pilliga and the outwash sand plain of the west/north Pilliga (see Table 1). The slow-moving streams of the outwash plain appear to support a far greater diversity of aquatic molluscs than the faster-flowing streams in the east. Only two (out of 14) aquatic species have been recorded in both areas. There was considerably more overlap (or less difference) amongst the native land snail assemblages of the two areas, with 10 (out of 16) species recorded in both. It remains to be seen whether these patterns are supported by continued sampling.

The mollusc fauna of the Pilliga (and Australia in general) comprises three different elements (Smith and Kershaw 1979). Families such as the Hyriidae, Charopidae and Rhytididae are part of an ancient Gondwanan group which predates the break-up of Australia, Africa and South America and is probably over 100 million years old. A second group, which includes the



Ponder, W.F., Clark, S.A. and Dallwitz, M.J., 2000. *Freshwater and Estuarine Molluscs: An Interactive, Illustrated Key for New South Wales*. CD ROM, CSIRO Publishing, Australia.

Ponder, W.F. and Walker, K.F., 2003. From mound springs to mighty rivers: The conservation status of freshwater molluscs in Australia. *Aquatic Ecosystem Health & Management* 6(1): 19-28.

Smith B.J. and Kershaw R.C., 1979 *Field Guide to the Non-Marine Molluscs of South Eastern Australia*. Australian National University Press: Canberra, Australia.

Stanisic, J. and Ponder, W.F., 2004. Forest snails in eastern Australia – one aspect of the other 99%. Pp. 127-149 in *Conservation of Australia's Forest Fauna* (2nd edition), edited by D. Lunney. Royal Zoological Society of New South Wales: Mosman, NSW, Australia.

Image captions:

Figure 1: *Velesunio ambiguus*, the most common mussel species found in the Pilliga, can survive buried in the moist sand below dry stream beds for up to 2 years.

Figure 2: *Notopala* sp. is the largest native gastropod in the Pilliga and was found in slow-moving streams which are dry for most of the year.

Figure 3: *Austrorhytida* sp. A is an undescribed species of carnivorous snail from the nearby Warrumbungle Ranges which was found in the Pilliga in both native woodland and in urban waste ground.

Camaenidae, only reached Australia from south-east Asia within the last 15 million years. Lastly, families such as the Physidae, Bradybaenidae, Limacidae, Helicidae and Zonitidae represent a modern element dating from the last 200 years and comprising ecologically catholic tramp species originating from Europe, eastern Asia and North America.

poorly sampled.

Acknowledgements

My children Jess, Nicola and Sam helped with field work. Michael Shea (Australian Museum) and John Stanisic (Queensland Museum) helped with species identification and Michael Shea also provided comments on a draft of this paper.

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Jones, H.A., 2007. The influence of hydrology on freshwater mussel (Bivalvia: Hyriidae) distributions in a semi-arid river system, the Barwon-Darling River and intersecting streams. Pp. 132-142 in *Animals of Arid Australia: out on their own?*, edited by C. Dickman, D. Lunney and S. Burgin. Royal Zoological Society of New South Wales, Mosman, NSW, Australia.

Kerney, M., 1999. *Atlas of the Land and Freshwater Molluscs of Britain and Ireland*. Harley Books, Colchester, England.

Much work remains to be done before Australia is able to produce a publication comparable to Kerney (1999), with detailed record-based distribution maps for all freshwater and terrestrial mollusc species at a national scale. An estimated two thirds of Australia's land snail fauna has yet to be formally described (Stanisic and Ponder 2004) and many parts of the continent have only been poorly sampled or not sampled at all. The present study demonstrates the unexpected diversity which can be found in an area previously only

Table 1. Mollusc species recorded in the Pilliga Scrub

		East Pilliga	West/North Pilliga (o utwash)
BIVALVES			
Corbiculidae	<i>Corbicula australis</i> (Deshayes, 1830)	X	
Hyriidae	<i>Alathyria jacksoni</i> Iredale, 1934		X
	<i>Velesunio ambiguus</i> (Philippi, 1847)	X	X
	<i>Velesunio wilsonii</i> (Lea, 1859)		X
FRESHWATER SNAILS			
Viviparidae	<i>Notopala</i> sp.		X
Ancylidae	<i>Ferrissia tasmanicus</i> (Tenison-Woods, 1876)	X	
Bithyniidae	<i>Gabbia vertiginosa</i> Frauenfeld, 1862		X
Planorbidae	<i>Bayardella cosmata</i> (Iredale, 1943)		X
	<i>Glyptophysa gibbosa</i> (Gould, 1847)	X	X
	<i>Helicorbis australiensis</i> (Smith, 1882)		X
	<i>Isidorella newcombi</i> (Adams & Angas, 1864)		X
Lymnaeidae	<i>Austropeplea huonensis</i> (Tenison-Woods, 1876)		X
	<i>Austropeplea lessoni</i> (Deshayes, 1830)		X
Physidae	<i>Physa acuta</i> Draparnaud, 1805 #	X	
LAND SNAILS			
Pupillidae	<i>Cylindrovertilla hedleyi</i> Pilsbry, 1920		X
	<i>Gastrocopta hedleyi</i> Pilsbry, 1917	X	X
	<i>Gastrocopta pediculus</i> (Shuttleworth, 1852)	X	X
	<i>Gastrocopta strangei</i> (Iredale, 1937)	X	X
	<i>Omegapilla australis</i> (Angas, 1864)		X
	<i>Pupoides myoporinae</i> (Tate, 1880)		X
	<i>Pupoides pacificus</i> (Pfeiffer, 1846)	X	X
Punctidae	<i>Paralaoma caputspinulae</i> (Reeve, 1851)	X	X
Charopidae	<i>Elsothera funerea</i> (Cox, 1868)	X	X
	Charopid species A	X	
Rhytididae	<i>Austrorhytida</i> species A	X	
Succineidae	<i>Austrosuccinea macgillivrayi</i> Cox, 1864	X	X
Camaenidae	<i>Galadistes intervenens</i> Iredale, 1938	X	X
	<i>Neveritis aridorum</i> (Cox, 1866)	X	X
	Camaenid species A	X	X
	Camaenid species B		X
Bradybaenidae	<i>Bradybaena similis</i> (Ferussac, 1821) #	X	
Limacidae	<i>Lehmannia nyctelia</i> (Bourguignat, 1861) #	X	X
	<i>Limax maximus</i> Linnaeus, 1758 #	X	
	<i>Cornu aspersum</i> (Muller, 1774) #	X	
	<i>Prietocella barbara</i> (Linnaeus, 1758) #	X	
Valloniidae	<i>Vallonia excentrica</i> Sterki, 1892 #	X	
Zonitidae	<i>Zonitoides arboreus</i> (Say, 1817) #	X	
	# introduced species		

Figure 4: Aftermath of an extreme intensity bushfire in the eastern Pilliga in 2006. All ground litter, ground vegetation and shrubs were incinerated, tree trunks were charred to 15 metres (49 feet) or higher and all canopy foliage scorched.

Figure 5: Streams in the Pilliga are dry for most of the year, although water can usually be found under the sand.

Figure 6: *Corbicula australis* was only found in fast flowing sandy streams in the eastern Pilliga. The Australian 5

cent coin is about the size of a UK 5p coin or a 2 Euro cent coin.

Figure 7: Two different shell shapes of the planorbid *Glyptophysa gibbosa* (left and centre) with the lymnaeid *Austropeplea lessoni* (right) collected from a dry stream in the west Pilliga.

Figure 8: The camaenid *Neveritis aridorum* is a widespread species in the Pilliga Scrub.

Figure 9: The introduced slug *Lehmannia nyctelia* is common in the

study area in gardens and urban waste ground.

Figure 10: The introduced slug *Limax maximus* is rare in the study area in urban gardens and waste ground.

Figure 11: Many land snails found in the Pilliga are very small. The punctid and pupillid shells shown here are dwarfed by an Australian 5 cent coin.



Snails and Shells help archaeologists learn about *Land and People* - the Conchological Society supports new publication *Mike Allen*

The Conchological Society has agreed to be a publishing partner for one volume of the newly established Prehistoric Society Research Papers Series. The publication *Land and People* is dedicated to the late John Evans, an archaeologist and conchologist who wrote in 1972 the definitive publication on *Land Snails in Archaeology* derived from his doctoral and post-doctoral research. The 20 papers cover many aspects of research he engaged in during his career; a number of papers on landscape archaeology and environmental archaeology – and not surprisingly a number of papers relate to land snails and shells, some written by members of the Conchological Society.

Papers by Paul Davies and Mark Robinson examine land snails in particular, with Paul discussing the nature of modern recording and ecology of woodland and Mark examining the palaeoecology of *Ena montana*. Palaeoecological sequences of land snails are discussed from Roman colluvium at Rock Roman villa on the Isle of Wight by George Speller, Richard Preece and Simon Parfitt, and from sediment cores from mire in Orkney by Terry O'Connor and Jane Bunting. Data derived from land snail evidence provide the basis of arguments of prehistoric land-use of the chalklands of southern England by Mike Allen and Julie Gardiner, and to a lesser extent by Charly French. Land snails were used in some of the preliminary work examining the prehistory of the Wylve valley, Wiltshire (Gardiner & Allen).

Marine shells, in the form of prehistoric middens, are discussed to examine continuity and change in the Mesolithic – Neolithic of the west coast of Scotland, by Nicky Milner and Oliver Craig. Their study included isotope and radiocarbon analysis of the shells.

The appreciation of John Evans first published in 2006 in *J. Conch.* 39 is re-published with but with some additional comments as well as a number of other molluscan references omitted from the previous list, and several published since then. This volume therefore brings together papers that address themes on a variety of levels. They cover geographical, methodological and thematic areas that were of interest to, and had been studied by, John Evans. In some instances papers have been inspired by John's approaches to landscape and landscape analysis and their application to new or wider areas

than John himself studied in detail. Others take forward, re-examine or elaborate on some of his specific theories and interpretations, looking at new or improved datasets. As a collection, the papers in this volume provide a diverse and cohesive picture of how archaeological landscapes are viewed within current research frameworks and approaches, while also paying tribute to the innovative and inspirational work of one of the leading protagonists of environmental archaeology and the holistic approach to landscape interpretation and showing how snails and shells have been, and continue to be, key to understanding some of our most important prehistoric landscapes and sites.

This new series has a distinctive format; the books are published in hard cover (no flopping about on your shelves), and are not that uniform uninteresting A4 format, but a squarer format and imaginatively designed allowing images to bleed into the white space making wide and varied content more pleasing to read. But also these volumes are affordable – due to subvention from the Prehistoric Society, and their skilled editors and editorial board, as well as co-operation from their co-publishers Oxbow Books and the support of the Conchological Society - the book is published at only £35. Pre-publication price is now only £25 and post-publication members of the Conchological Society are entitled to a 25% discount on the normal cover price.

The book will be launched at the Association for Environmental Archaeology's 30th Anniversary Conference in York on 3-5th September 2009. The volume will contain a *Tabula Commemorativa* that will be published in the front of the book of all those who wish to honour John, his work and contribution to environmental archaeology, conchology, and archaeological thinking. To take advantage of the pre-publication offer and to honour the achievements of John G Evans by adding your name to the *Tabula Commemorativa* please download the form on the Conchological Society Website or use the form below.



Diary of Meetings - Conchological Society

Programme Secretary: Ron Boyce, 447c Wokingham Road, Earley, Reading, Berkshire RG6 7EL

IMPORTANT: Please remember to inform the leader if you are attending a field meeting. If you are held up in traffic or your public transport is delayed, it may be possible to ring the Programme Secretary on 0794 109 4395 on the day of the meeting for information on the location of the field site being surveyed.

Indoor meetings at the Natural History Museum will take place in the Dorothea Bate Room [Palaeontology Demonstration Room] at the end of Gallery 30, unless otherwise stated. Please note the earlier start times, and also the long indoor meeting in October with an early start time of 11:00h. Please bring plenty of exhibits and demonstration material.

The 2009 Annual General Meeting will take place in the lobby of the Flett Lecture Theatre at the Natural History Museum on 18 April starting at 13:30h. On this occasion please use the Museum Geology entrance in Exhibition Road. The Flett lobby is on the left at the top of the Palladian staircase. The Programme Secretary will be happy to receive any offers to lead field meetings or suggestions for speakers for indoor meetings.

Key to meetings:

- NHM** = Natural History Museum, London, indoor meeting
- FIELD** = Field Meeting at outdoor location
- WKSHP** = Workshop on Molluscan topic
- YCS** = Yorkshire Conch. Soc. events

FIELD - Saturday 9 May
Lower Smite Farm, Worcester
Leader: Harry Green
(01386 710377) (home),

harrygreen_worcs@yahoo.co.uk

Meet at the farm, grid ref. SO 889590, at 10.30h.

The farmhouse and buildings at Lower Smite Farm form the headquarters of the Worcestershire Wildlife Trust which also farms the surrounding 125 acres in an environmentally friendly fashion. The farm is a mixture of pasture and arable with a series of hedges, ditches and ponds. Although some agrichemicals have been used the farm has escaped intensive cultivation. Molluscicides have not been used. The plan for the day is to sample a series of sites throughout the farm to give a picture of the molluscs of a fairly ordinary patch of central Worcestershire: a change from ancient woods and limestone grasslands.

Lower Smite Farm lies just north of Worcester near junction 6 on the M5 motorway. From the roundabout over the M5 follow the A 4538 NW (signposted Droitwich) for about a mile. Brown signs to Lower Smite Farm with the Wildlife Trust's badger logo are situated on the SW side of the road indicating a turn on the opposite side of the road. Follow this minor road for about 400 metres to the farm buildings on the left labelled Worcestershire Wildlife Trust. Enter and park!

Bring suitable outdoor clothing for a country walk, and lunch.

YCS - Saturday 9 May
Rudston area, VC61.
Contact: David Lindley
(0113 2697047) (home),
david.lindley3@btinternet.com

Meet at 10:30h in the village centre near the church, grid

ref. TA 097677, for 1-km recording on the Yorkshire Wolds.

FIELD - Saturday 13 June
Crab Wood, Winchester.
Helicodonta obvoluta search.
Joint meeting with Southampton Natural History Society
Leader: June Chatfield
(01420 82214) (home)

Members should bring packed lunch and drinks. The morning will be in the beech wood of Crab Wood (Hampshire Wildlife Trust) and the afternoon in West Wood to the west.

Meet at 10:30h in the Hampshire County Council free car park for Crab Wood near the cross roads 1.5 miles south of Sparsholt. The site is about 3 miles west of Winchester, Grid reference SU 435293.

Please contact the leader if coming to Winchester by train and needing a lift to the wood, or for any other information.

FIELD - Saturday 4 July
Yorkshire, Kettlewell area
Joint meeting with Yorkshire Naturalists' Union
Leader: Adrian Norris
(01132 745244) (home)

This meeting in VC64 is being held at Kettlewell by kind permission of the National Trust. Meet at 10:30h just inside the entrance to the National Trust area on the western side of New Bridge, Kettlewell, Grid Reference SE 967723. The NT property is situated on the west bank of the River Wharfe on the outskirts of the village.

Kettlewell is known to be one of the busiest villages of the Yorkshire Dales with large numbers of visitors descending on the area,

particularly at weekends. A small public car park is situated at the entrance to the village. If this is full, alternative car parks can usually be found as some local land owners open their fields to raise money for charity.

The main area to be visited is an area of limestone grassland and crags, with springs and flushes facing north-east. However, public footpaths run alongside the River Wharfe on both sides of the river between Kettlewell and Starbotton, a return journey of approximately 10 kilometres, and the Dales Way footpath runs along the western side of the river northwards and the eastern side south. Further footpaths climb the east facing slopes of Knipe Scar and down to Hawkswick.

Maps: Explorer Series No. OL30 Yorkshire Dales Northern & Central areas; Landranger Series No. 98 Wensleydale & Upper Wharfedale.

The tea and meeting will be at 16:30h. The site for this meeting will be announced at the start of the meeting, and this information should be available earlier via the YNU Website.

FIELD - Saturday 11 July
Loddon Bridge/Sandford Mill
Freshwater meeting
Leader: Rosemary Hill
(0118 9665160) (home)

This meeting gives an opportunity to sample the River Loddon further downstream than at the 2007 meeting and to look at additional gravel pit lakes of different stages of development in Dinton Pastures Country Park. It is hoped that it may be possible to extend the species list,

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