Autumn 2016 - Issue 66

The Rehabilitator

BWRC NEWSLETTER

In this issue

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Front cover: Manx Shearwater (Puffinus puffinus) courtesy of Gower Bird Hospital

A word from the Chair

Welcome to the Autumn 2016 edition of The Rehabilitator! In this issue we bring you news of publication of the new BVZS Guidelines for Wildlife Rehabilitation Units – the story of which began (for BWRC) at our symposium in Scotland in 2014, where we heard from Mike Stanford & Liz Mullineaux about concerns of risks of rehabilitators and vets being caught out by legislation controlling veterinary practice. Since then we have worked with BVZS to produce their new guidelines – see pages 15-16 for more details.

It is my pleasure to welcome new trustee Dr Stephen Cooke BVSc, MRCVS who will take over the role of Treasurer. Steve qualified from Bristol University in 1981 and has practiced small animal practice with a special interest in exotics and British wildlife. On graduating he set up a charity which later became Swan Lifeline, and developed the first successful treatment of lead poisoning in swans, as well as supporting the Private Members Bill that led to the banning of the use of lead split shot by anglers. More recently Steve has acted as an Expert Witness in multiple legal proceedings, and is working with John Cooper on a forensic facility for wildlife crime. Steve has managed his own veterinary businesses and so also brings the skills we need in a Treasurer with his appointment, to allow our previous treasurer Janet Peto to retire.

In recent years we have rotated the BWRC annual symposium between the venues in the south or midlands of England, Scotland, and then every third year Lower Moss Wood Wildlife Hospital have taken a turn at organising and hosting the symposium. Unfortunately this year, due to circumstances

beyond their control, it has not been possible to organise a symposium this Autumn, but they are considering organising a meeting next Spring – watch this space.

However that doesn't mean that there are no other options this conference season! At the time of writing I'm looking forward to attending the inaugural conference of the Wild Animal Welfare Committee (WAWC) on Tuesday 8th November at Edinburgh City Chambers – will report back in the Winter edition.

As always – if you have comments or would like to contribute articles or advertise events please contact editor@bwrc.org.uk. If you are a working rehabilitator, make sure that your up-to-date details are on our Directory of Rehabilitators – you can download a 'Rehabilitation Unit Contact Form' from the 'Find a Rehabilitator' page of our website (wwwbwrc.org.uk) or see inside the back cover of this newsletter.

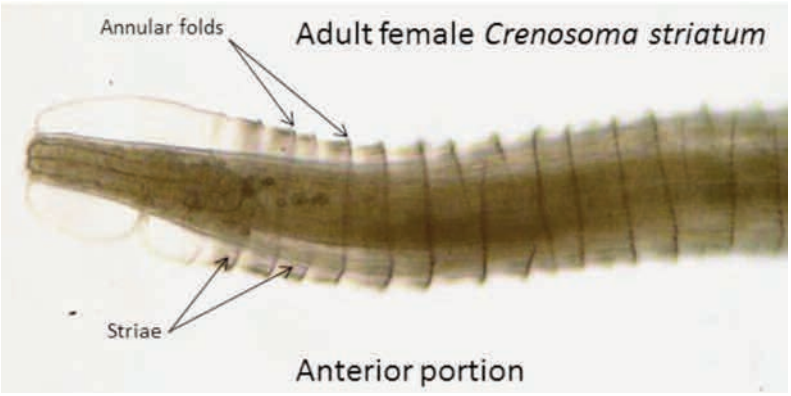
Terri Amory

BWRC Chair

Study investigating lungworm burden and lung disease in hedgehogs

Simon Allen MSc(R) from Gower Bird Hospital explains how his research into lung disease in hedgehogs has led him towards stabilising (and even perhaps achieving weight gain in) autumn juvenile hedgehogs before asking his vet to consider worming treatments…

Crenosoma striatum is one of 12 known species of *Crenosoma* [1] and is relatively common in hedgehog populations sampled across Europe including Germany [2, 3], Switzerland [4], Poland [5], Italy [6], Turkey [7] and Britain [8-10]. It is the oldest known species of this genus, first observed from the bronchi of a hedgehog over 330 years ago in Florence, Italy by Francesco Redi [11], but its relationship with hedgehogs probably goes back much further, possibly as far back as the last ice age.



The Hedgehog Lungworm: *Crenosoma striatum*

There are no records of this nematode in any other species other than the hedgehog family which may reflect the length of time both species have lived together. It is a bursate nematode which means the males have a pronounced bursa at the tail end used for sexual reproduction (fig1). It lives and reproduces in the lungs making it a true lungworm (fig2).

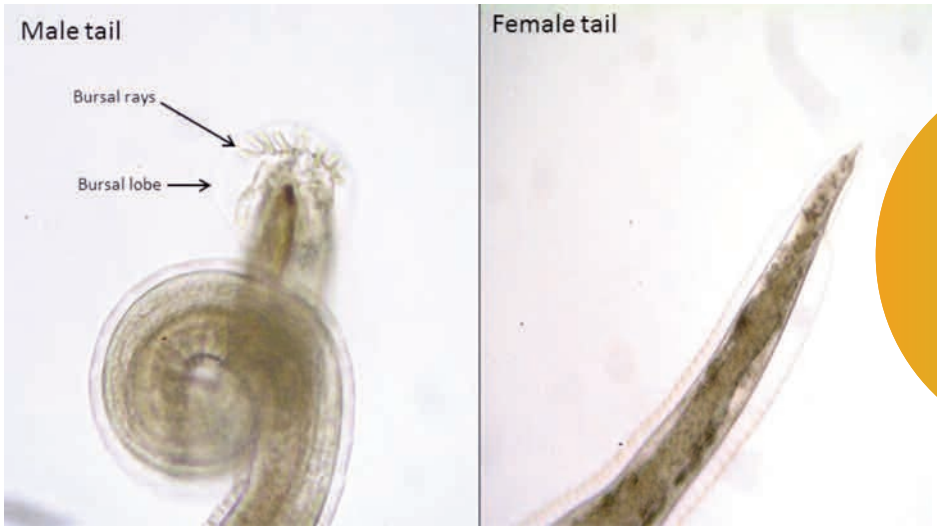


Fig. 1. Difference between male and female tails.

Life Cycle

C. striatum is ovo-viviparous, which means the larvae break out of their eggs inside the female. The larvae (L1) are coughed up by the hedgehog, swallowed and passed out in the faeces (fig3). The life cycle is indirect via a range of molluscan intermediate hosts, 8 slugs and 9 snail species have been recorded as capable of being intermediate hosts, but many more are likely [12, 13]. The larvae enter the molluscan host, where they develop and become infective when they reach the third stage of development (L3) at between 12 to 15 days [12] (the rate of development depends on environmental temperature).

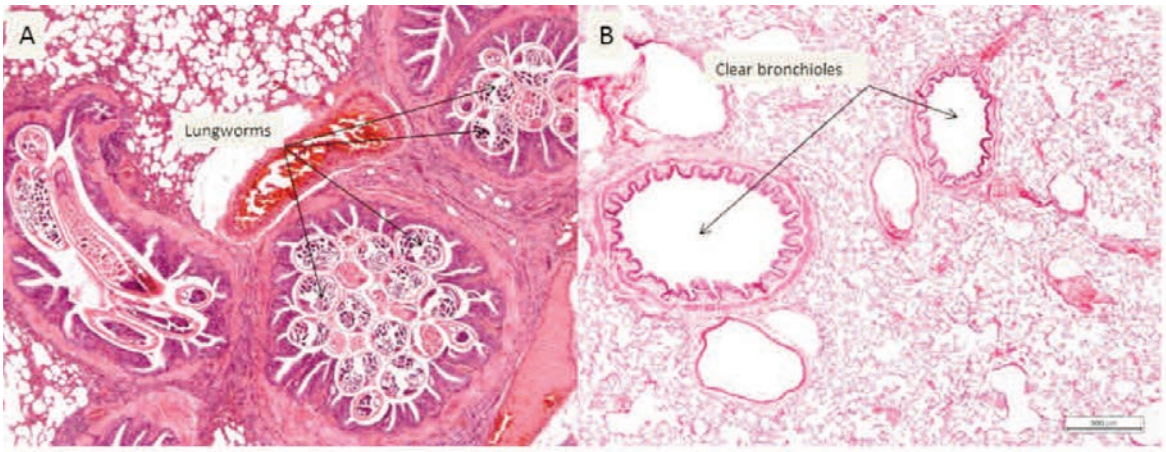


Figure 2. Standard 4µm transverse hedgehog lung sections stained with haematoxylin and eosin. Panel (A) shows adult lungworms in the bronchioles of the lungs. Panel (B) shows the bronchioles in the absence of lungworm infection.

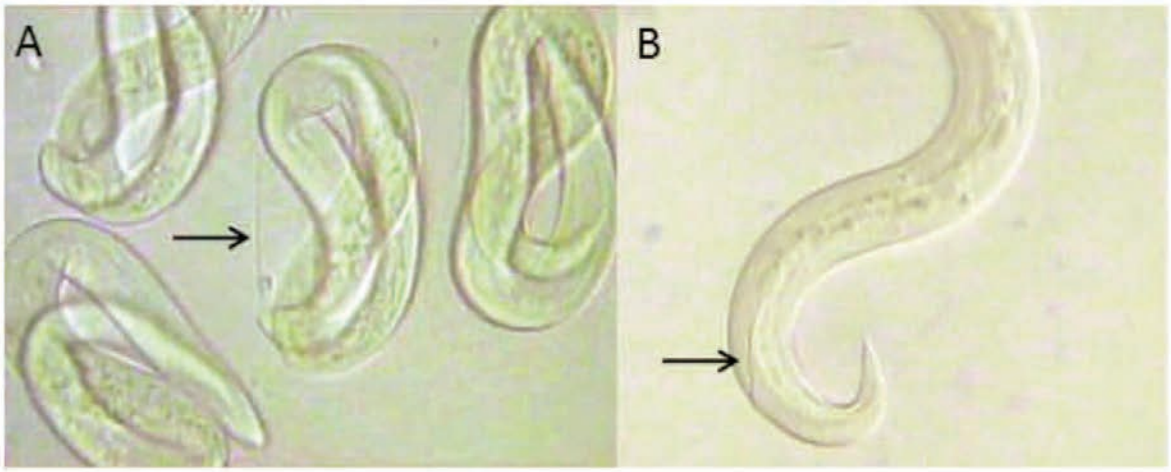


Figure 3 (A) C. *striatum* larvae within the fine egg shell indicated by arrow, magnification X400. (B) Free swimming C. *striatum* larva tail detail, anal pore indicated by arrow. The larvae are between 250 µm and 287 µm in length.

The hedgehog becomes infected by eating the intermediate host, the L3 larvae then travel to the lungs. The route from the stomach

to the lungs has not been studied in hedgehogs, although *Crenosoma vulpis*, a closely related lungworm of red foxes (Vulpes vulpes) travels to the lungs via the visceral lymphatics, thoracic duct, vena cava, and to the right side of the heart which pumps blood and hence the larvae to the lungs [14]. The time taken for L3 to make this journey from the stomach to the lungs in hedgehogs can take 48 hours [12]. The prepatent period (the period before larvae appear in the faeces after infection) is 19 to 21 days.

Pathology and Treatment

C. striatum is reported to be an important cause of disease and death in hedgehogs with a high incidence of infection occurring in juvenile hedgehogs presented at rescue centres in the autumn [15, 16]. It has been stated that verminous pneumonia due to lungworm infection in first-year hedgehogs in the autumn approaches 100% and the mortality rate can be high [17]. The presence of the worms in the lungs activates the immune system and it's this immune response which causes most of the damage to the lungs not the actual worms themselves [17, 18] (Fig4).

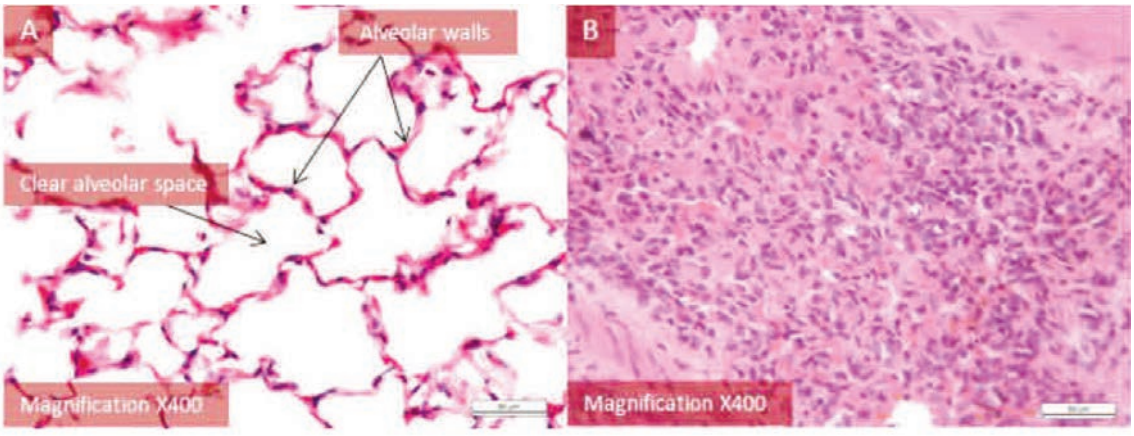


Figure 4. Panel A shows a normal lung section showing a lace-like appearance with clear airspaces and airways. The

alveolar walls have a thin and delicate appearance. Panel B shows severe interstitial pneumonia, characterised by loss of alveolar space due to consolidation of pulmonary tissue by inflammatory infiltration. There are no clear airspaces visible and the alveolar walls are not discernible,

However a study investigating lungworm burden and lung disease in hedgehogs found that statistically juvenile hedgehogs were less likely to have lung disease, even though the overall intensity of infection with lungworms was higher in the juvenile sample than the adult sample [13]. In practical terms, this may switch attention from focussing primarily on the parasite burden and wormers to a more holistic approach to supportive treatment in the early stages of rehabilitation for autumn juveniles.

During the study of lung disease a controlled clinical trial on the efficacy of levamisole and ivermectin was carried out. The findings were that levamisole was statistically more effective at reducing *Crenosoma striatum* infection in the respiratory tract of hedgehogs than ivermectin during the trial period. Anecdotally some of the hedgehogs in the clinical trial developed bronchitis after the removal of *C. striatum*. It was found that another lungworm species know to infect hedgehogs *Eucoleus aerophilus* (synonymous with *Capillaria aerophila*) was still present. A follow on treatment with ivermectin resolved the infection.

<u>Caution</u>
The use of ivermectin in mal-nourished hedgehogs should be avoided. Please seek the advice of your veterinary surgeon when worming your hedgehogs. Levamisole and ivermectin are Prescription Only Medicines for Veterinary use (POM-V). POM-V medicines must be prescribed by a veterinary surgeon, who must

first carry out a clinical assessment of the animal under his or her care.

Acknowledgements
I would like to thank Professor Michael Day, Dr Alex Barlow and Dr Eric Morgan of Bristol University for their patience and help with the pathology investigation and the design of the anthelmintic clinical trials. I would also like to thank Gower Bird Hospital veterinary surgeon Brita Webb MRCVS for overseeing the clinical trials at the centre.

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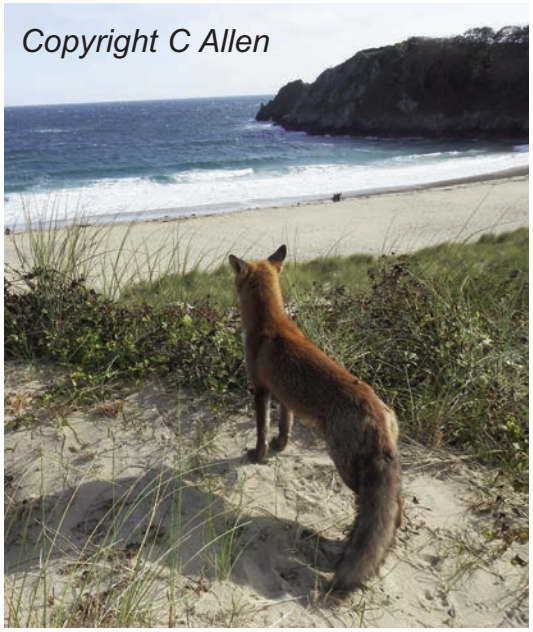
Review

Struggle to find time to keep up with the latest published research? BWRC Trustee Dr Dan Forman distils the 'take-home message from a recently published paper...'

Does temporary captivity during rehabilitation affect fox dispersal and ranging behaviour post-release?



A necessary and unavoidable aspect of wildlife rehabilitation is the removal of sick and injured animals from their natural habitats for treatment before being released back to where they originated from. It is clearly important, however, to understand how temporary captivity affects the social behaviour, movements and integration of animals back into the population they derived from post-release. A study published in the Applied Animal Behaviour journal recently examined this important topic in red foxes. In this study, the movements and range size of seven rehabilitated foxes post release were compared to those of 13 wild caught foxes over a two year period using GPS tracking equipment. The results of this study revealed that rehabilitated foxes occupied larger home ranges, were less likely to form a stable home range size, and travelled further from release sites than wild caught foxes. Females from both rehabilitated and wild caught cohorts travelled

further than males, and this data was thought to be influenced by two wild vixens who increased their range size and localised movements during breeding.

So what does this mean from a welfare perspective and for wildlife rehabilitators?

The authors discussed the previously known links between increasing dispersal distances and the risk of mortality (the further animals disperse the greater the risk of mortality). As rehabilitated foxes travel further in general, they may be more prone to negative sub-lethal effects that may affect their survival and reintegration into fox society. These negative sub-lethal effects include the threat of aggression from conspecifics as they pass through existing established fox territories and try to establish a home range, difficulties in integrating back into fox society and a lack of knowledge of where food resources are located which may lead to nutritional stress. Although the sample sizes used in this study were relatively small (20 foxes), the authors argue that, given the results of this study, a precautionary approach should be adopted, specifically minimising the duration that animals are held in captivity prior to release and that alternatives to care in captive environments are considered in the decision-making process during wildlife rehabilitation. Further research is necessary on this complex and multi-faceted subject in foxes and other species if we are to fully understand the long term post release success and survival of animals that have been housed temporality for rehabilitation.

The citation of the paper discussed in this resume is: Tolhurst, B., Grogan, A., Hughes, H. & Scott, D. 2016. Effects of temporary captivity on ranging behaviour in urban red foxes (Vulpes vulpes). Applied Animal Behaviour Science. **181**: 182–190. The full paper can be accessed via Google Scholar

New BVZS Guidelines for Wildlife Rehabilitation Units

Terri Amory

It was at BWRC Symposium 2014 that we first heard from Michael ('Stan') Stanford who was at the time President of the British Veterinary Zoological Society (BVZS) and Liz Mullineaux, vet for Secret World Wildlife Rescue, about their concerns that rehabilitators and their vets might soon come under increased scrutiny from the authorities regarding their wildlife practice.

In his role as a Claims Consultant for the Veterinary Defence Society (professional indemnity insurers for most UK vets and VNs) Stan was hearing of cases where vets and lay staff working with wildlife were seeking legal representation because they were falling foul of interpretations of legislation regarding what non-vets are legally allowed to do, and exactly what "under veterinary supervision" means with regards to procedures and the use of controlled drugs such as those used for chemical euthanasia.

You can read articles detailing both Stan and Liz' presentations from the symposium in issues 60 and 61 of The Rehabilitator – these are available to download from our website - **http://bwrc.org.uk** – under the 'newsletters' tab.

Subsequent to the Symposium, Liz and other BVZS members started work on a set of good practice guidelines for wildlife rehabilitation based on their zoo inspection guidelines model. The following summer a draft of the guidelines were distributed to stakeholders including the BWRC for feedback. BWRC trustees spent some weeks working through the guidelines and putting together feedback to the BVZS particularly concerning issues of scale, cost and practicality from the point of view of rehabilitators often working from a very different financial position to that of zoos.

BWRC were sent the final draft of the new guidelines in September 2016 by the current BVZS President Mark Stidworthy, and contributed the following statement to the BVZS press release –

“BWRC aims to support and promote the professional integrity of wildlife rehabilitators. While we recognise that meeting all of these guidelines may be difficult (particularly for smaller scale rehabilitators) we hope that they will enable rehabilitators to work alongside veterinary partners with increased awareness and confidence in their own working policies and procedures.”

The guidelines were published at the beginning of October, and can be downloaded as a pdf document from the BVZS website (it is not necessary to be a BVZS member) by clicking on the “Position Statements” tab, and selecting BVZS Good Practice Guidelines for Wildlife Rehabilitation Centres or use the following link -

http://www.bvzs.org/images/uploads/BVZS_Good_Practice_Guidelines_for_Wildlife_Centres_011016_.pdf

If you have feedback about these new guidelines please share it with us (for publication or not!) by e-mailing **bwrcouncil@gmail.com**.

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Please tick to confirm you have read the Terms and Conditions of BWRC Associate Membership ☐

Please tick this box if you are a practising rehabilitator (for BWRC statistics only). ☐

Regular payment of membership allows us to plan for future activities knowing funds are available. If you would like to help in this way by paying by standing order, please complete this form (including your name and address above). Please note that Associate Membership runs from the 1st January to 31st December each year.

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If you are a UK tax-payer your membership (and donations) can be worth 25% more to the BWRC – so £10 becomes £12.50 at no extra cost to you. Please tick the box and sign the declaration below. Thank you.

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1.1 Applications for associate membership will be considered by the BWRC who have the right to refuse applications.
1.2 By submitting an application form by email, the Associate Member is deemed to have signed the application form.
1.3 All information provided by you to us must be true and accurate at the point of applying. In the event of a change of circumstances such as moving jobs, change of contact details you must notify the BWRC by phone, email or in writing so that our records are up to date.

2. Membership Payments, Renewals and Cancellations

2.1 Associate Membership is £15 per person per calendar year starting on 1st January. Associate Membership will be activated at point of approval of the application but payment must be received within 30 days of application.
2.2 Payment can be made by cheque, BACS or Standing Order. If Associate Membership payment remains outstanding we will notify you by telephone, email or letter.
2.3 It is the member's responsibility to advise the BWRC of their intention not to renew. Subscription payments not received within one month of becoming due will result in the membership being considered lapsed and all services or benefits may be suspended pending payment. However, Associate Membership charges will continue to accrue, until resignation is received in writing, subject to the cancellation procedure outlined below. To cancel your membership you will need to notify us in writing stating a reason which will be recorded for internal use only. Refunds will not be given for cancelled memberships.

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3.1 Individual Associate Membership.
- 3.1.1 Associate individual non-voting membership of the BWRC does not count as membership for legal purposes; therefore Associate Members do not have any voting rights, legal obligations to act in the interests of the BWRC, or any liability to contribute to the assets of the BWRC on dissolution.
- 3.1.2 Associate membership belongs to the individual and not to the organisation regardless of who pays for the membership. Any dispute arising from this must be resolved by the member and their organisation. You will be issued with a membership number which you should use when calling us to help identify you quickly.
- 3.1.3 It is the Associate Member's responsibility to keep their membership number confidential. The BWRC reserves the right to withdraw Membership or to prevent any Member from renewing if the Member is misusing the membership benefits (for example, allowing someone else to use the benefits of their membership package).

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4.1 Associate Member benefits are only available if subscription payments are up to date.
4.2 Associate Member benefits may change without notice.

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5.1 The BWRC reserves the right to withdraw membership or to prevent any Associate Member from renewing membership if the Member puts the BWRC into disrepute.
5.2 The BWRC reserves the right to withdraw membership if the Associate Member is deemed to have misused the membership privileges.
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6. Variation of Terms & Conditions

6.1 These terms and conditions may be revised from time to time. If they are revised, we will post or email the revised version to you. It will be your responsibility to keep up-to date with all such changes and your continued membership shall be deemed acceptance of any changes to these terms and conditions.

31 January 2015

British Wildlife Rehabilitation Council

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1. Name of rehabilitator or organisation	
2. Address (or town/district)	
3. County	
4. Telephone number	
5. Alternative telephone (e.g. mobile)	
6. E-mail address, if applicable	
7. Web address, if applicable	
7. Species of casualty accepted and any additional comments on the facilities of the unit to be included in your entry – alternatively, please note here if your organization provides a related service other than direct rehabilitation [continue overleaf if necessary]	
8. Opening hours/preferred times for calls, if applicable	
9. Are you prepared to collect casualties? [If so, specify area/terms as necessary]	
10. If you are sending us a hard copy of this form, please sign alongside & print your name to confirm that you understand that the above details will be stored in the BWRC Contact List database and may be displayed on the BWRC website.	**Signed** **Print name**

IF YOU ARE RETURNING THIS FORM BY EMAIL, PLEASE INCLUDE THE FOLLOWING STATEMENT ON THE FACE OF YOUR EMAIL TO ENABLE US TO USE YOUR DATA:

"I hereby give my permission for the attached details to be stored in the BWRC Contact List database and displayed on the BWRC website."

PLEASE HELP US TO KEEP THE BWRC REHABILITATION UNIT CONTACT LIST UP TO DATE BY NOTIFYING US OF ANY CHANGES TO THE ABOVE DETAILS AS SOON AS POSSIBLE.

Please return to: *Mrs Anne Maskell, 27 Admiral's Way, Eaton Socon, St Neots, PE19 8TD*

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