



White-nose syndrome: Guidance for bat workers in the UK and the Isle of Man

This document has been produced by the Bat Conservation Trust in collaboration with Natural England, Natural Resources Wales, Scottish Natural Heritage, the Department of Environment, Food & Agriculture, and Animal & Plant Health Agency. The first section provides an overview of white-nose syndrome, and introduces what we are requesting bat workers in the UK to do and the reasons for this. Step-by-step guidelines for different types of bat workers involved in hibernation checks and swarming surveys are then provided in subsequent sections.

Contents

1. Background	2
1.1 What is white-nose syndrome?.....	2
1.2 What causes WNS?.....	2
1.3 Have there been any cases of WNS in the UK, Europe or other parts of the world?	2
1.4 What does the discovery of <i>P. destructans</i> in the UK mean for our bats?	3
1.5 What is being asked of UK bat workers?.....	3
1.6 What should I do if I observe symptom(s) of WNS?.....	4
1.7 What decontamination products can I use?	4
1.8 Why are decontamination procedures recommended?	5
1.9 Overseas travel.....	5
1.10 Why report negative cases?	5
2. Guidelines for licensed bat workers undertaking hibernation checks	6
2.1 Preparation	6
2.2 Suggested Good Practice	6
2.3 On-site.....	6
2.4 Follow-up	7
3. Guidelines for unlicensed bat workers checking underground sites for potential use by bats	9
3.1 Preparation	9
3.2 Suggested Good Practice	9
3.3 On-site.....	9
3.4 Follow-up	10
4. Guidelines for volunteers assisting on a site visit.....	11
Appendix I: Photo examples of <i>P. destructans</i>	12
Appendix II: Field surveillance form.....	14

1. Background

1.1 What is white-nose syndrome?

White-nose syndrome (WNS) is the name used to describe a group of symptoms associated with the deaths of over 5.7 million bats since 2006 across the Eastern USA (26 states) and Canada (five provinces)¹. These symptoms are:

- bats with a white fungus (*Pseudogymnoascus destructans*), particularly around the nose, but also on the wings, ears and/or tail (see photos in Appendix I)
- bats clustered near the entrances of hibernacula, or in areas not normally identified as winter roost sites
- bats flying outside during the day in temperatures at or below freezing, and/or
- dead or dying bats in or near hibernation sites

In isolation, the symptoms do not necessarily indicate WNS; for example bats with a white fungus might otherwise be perfectly healthy. Conversely, not all bats affected with WNS will necessarily be found with white fungus on them.

1.2 What causes WNS?

The fungus, *P. destructans*, has been confirmed as the cause of WNS². It is a soil fungus that grows optimally at the temperatures found in winter hibernacula, which irritates the bats and causes energetically-expensive arousals from hibernation, loss of body fat and starvation. Research has also suggested that infections on the wing membranes of bats may lead to dehydration thereby increasing the frequency of arousals³. Additionally where the fungus causes lesions in the wing membrane, this may affect the fitness of bats that survive the hibernation period. It is likely that *P. destructans* was introduced into North America from Europe.⁴

1.3 Have there been any cases of WNS in the UK, Europe or in other parts of the world?

In Europe the fungus *P. destructans* was originally identified on a single hibernating bat in France in 2009. It has now been identified in a total of seventeen European countries (from molecular analysis in 14 countries and from photographic evidence in another three countries). This includes the UK where the fungus was first discovered in 2013, through a combination of active and passive surveillance projects. Unlike North America, there have been no reports of mass die offs and therefore there is no evidence of the syndrome itself in Europe. It is thought probable that European bats have a resistance to the fungus, possibly evolved over thousands of years of exposure⁵.

¹ US Fish & Wildlife Service Figures. See: <http://www.whitenosesyndrome.org/about-white-nose-syndrome>

² Lorch, J. M. *et al.* (2011) Experimental infection of bats with *Geomyces destructans* causes white-nose syndrome. *Nature* doi:10.1038/nature10590

³ Willis, C.K.R., *et al.* (2011) Evaporative Water Loss Is a Plausible Explanation for Mortality of Bats from White-Nose Syndrome. *Integrative and Comparative Biology* 51(3): 364-373

⁴ Warnecke, L. *et al.*, (2012) Inoculation of bats with European *Geomyces destructans* supports the novel pathogen hypothesis for the origin of white-nose syndrome. *PNAS* online; available at: www.pnas.org/cgi/doi/10.1073/pnas.1200374109

⁵ Peuchmaille, *et al.* (2011). White-nose syndrome: is this emerging disease a threat to European bats? *Trends in Ecology and Evolution*, 26(11): 570-576

⁶ Hoyt, *et al.* (2016). Widespread Bat white-nose syndrome fungus in northeastern China [letter]. *Emerging Infectious Diseases*. Jan. Available online at: http://wwwnc.cdc.gov/eid/article/22/1/15-1314_article

The fungus has most recently been confirmed in north eastern China⁶. As has been observed in Europe there is no evidence that the fungus is causing mass mortality.

1.4 What does the discovery of *P. destructans* in the UK mean for our bats?

We now have positive confirmation of the presence of the fungus at five sites in south-east England (in Kent and Sussex) and a further site in East Anglia (Norfolk). There have been no significant mortalities reported from any of the sites the samples were collected at, or mass mortalities at any other hibernation site in the UK.

Further work is underway to determine the wider distribution of the fungus across the UK with National Bat Monitoring Programme volunteers having collected environmental samples in early 2014 from 26 sites in England, Scotland, Wales and Northern Ireland. These samples are being analysed as part of a Pan-European project. The results should be available in 2016 and will contribute to our understanding of how widespread the fungus is.

The discovery of the fungus without the mass mortalities observed in North America, mirror that seen across the rest of Europe. This allows us to be cautiously optimistic that in the UK, like the rest of Europe, our bats have lived alongside the fungus for a long time and have developed a resistance to it.

1.5 What is being asked of UK bat workers?

Guidance for UK bat workers has not changed following the discovery of *P. destructans* in the UK. We are continuing to ask all visitors to underground hibernation sites to remain vigilant for the symptoms commonly associated with WNS (as listed in 1.1) as part of their usual survey activities. We are not requesting that bat workers do additional checks for signs of WNS. Furthermore, licensed bat workers should not handle suspect live bats; in cases where a live bat is found with a suspect fungus, a sample should be taken from visible fungal lesions whilst the bat is in a hanging position.

All UK bats and their roosts are fully protected under UK and European legislation. This means that **you must not enter a known hibernaculum without an appropriate licence or accompanied by an appropriately licensed bat worker, and disturbance to bats during licensed work must be kept to a minimum.**

Detailed guidelines for bat workers are provided in sections 2 to 4 of this document; table 1.1 summarises what is being asked of different groups of bat workers.

Please note that we are now focusing testing on live bats observed with the characteristic fungus at hibernation sites. Where dead bats are found with a fungus – only very fresh specimens will be considered for testing. This decision has been made based on our experience and understanding of the fungus. In addition all of the dead bats tested to date have been negative for PD, with only saprophytic fungi cultured from these bats.

There are a separate set of guidelines for bat carers, these can be downloaded from http://www.bats.org.uk/pages/about_bats-white-nose_syndrome-586.html

1.6 What should I do if I observe symptom(s) of WNS?

If you observe any of the symptoms associated with WNS, please follow the step by step instructions (as relevant to you) provided in sections 2-4. In particular, please follow the recommended decontamination procedures and do not visit any further sites without having first decontaminated equipment and clothing.

Table 1.1 An overview of what is being requested of whom

	Licensed bat workers	Unlicensed ecologists checking sites for potential-use by bats	Volunteers assisting on a site visit
Familiarise yourself with commonly observed symptoms	✓	✓	✓
Be vigilant on site whilst undertaking usual survey activities	✓	✓	✓
Add items to your standard kit list	✓	✓	✗
Sample suspect dead bats (if fresh)	✓	✓	✗
Sample suspect LIVE bats	✓	✗	✗
Follow decontamination procedures	✓	✓	✓
Report suspect cases	✓	✓	✗
Report negative cases	✓	✗	✗

1.7 What decontamination products can I use?

The decontamination products you use need to contain an anti-fungal agent. Prior to use of a disinfectant please check the relevant product data sheets to ensure anti-fungal action and the correct dilution rates for use. An increased concentration should be used if boots, equipment, etc. are wet.

There are a number of disinfectants available that have anti-fungal properties:

- Ark-Klens – available online from http://www.vetark.co.uk/Shop/Falconry/Hygiene/Ark-Klens_7.aspx (the 'ready to use' product is £6.04; December 2014 price).
- Anigene – available from various suppliers including online from amazon http://www.amazon.co.uk/Anigene-Surface-Disinfectant-Replaces-LAVENDER/dp/B008S8VMTO/ref=sr_1_1?ie=UTF8&qid=1383148064&sr=8-1&keywords=trigene+disinfectant (from £19.69 per litre of concentrate; November 2015 price)

- Virkon S (DuPont) – available from various suppliers including online from www.animalmedicationdirect.co.uk/virkon-s-1kg-5kg-10kg-50x-50g-sachets-pr-6022.html (£16.39 for 1kg box; November 2015 price)
- F10 – available from Meadows Animal Health Care online at www.mah-shop.co.uk/f10-ready-to-use-disinfectant-160-p.asp (£8.75 for 1 litre of ready to use disinfectant; November 2015 price)
- Lysol (Reckitt Benckiser) – available from various suppliers including online from www.amazon.co.uk (various sizes and prices)

For easy application, we suggest decanting ‘ready to use’ disinfectant into a trigger spray container, such as those available from hardware stores (check usage instructions on the product you have purchase). For example www.arco.co.uk/products/5634489 – cost £1.80 (excl. VAT; November 2015 price).

The skin cleaner Hibiscrub is also a useful antifungal for use on hands. This is available from various suppliers including amazon http://www.amazon.co.uk/Hibiscrub-250ml/dp/B001A33VRU/ref=sr_1_6?ie=UTF8&qid=1383147933&sr=8-6&keywords=hibi+scrub for £7.45 (November 2015 price). You can, alternatively, wash your hands thoroughly with soap and water. However, this method can be more difficult in the field.

Please note: general antibacterial hand gels are NOT effective against fungal spores.

1.8 Why are decontamination procedures recommended?

Although we have reason to believe that our bats, like those in the rest of Europe are resistant to the effects of the fungus, further monitoring work is required to confirm this and to better understand the distribution of this fungus across the UK. Whilst we undertake this further work we ask all those visiting hibernation sites to follow a precautionary approach and continue with decontamination procedures to minimise the risk of transmission.

1.9 Overseas travel

Decontamination procedures are particularly important if you are considering visiting underground and/or hibernation sites in other countries. Across Europe, bat workers are being asked to follow basic decontamination protocols. Please also note that clothing, footwear, and equipment, such as harp traps, bat bags, weighing tubes, rulers, and gloves, have not yet been ruled out as vectors of transmission of Pd between sites.

1.10 Why report negative cases?

Negative sightings are as important as reports of suspect cases because they help to build a true picture of the fungus’ distribution, which in turn will inform future action and policy. Therefore, even if you do not observe any of the signs commonly associated with WNS, please do report back.

You can do this by ticking the relevant box on your NBMP hibernation form or by keeping a simple spreadsheet of sites and submitting these to BCT at the end of the survey season. (See section 2.4 for more details).

2. Guidelines for licensed bat workers undertaking hibernation checks

Please note that only live bats and fresh dead bat samples are now tested – unless a large number of dead bats are observed with the characteristic fungus.

2.1 Preparation

Prior to undertaking a site visit, please:

- Ensure you are familiar with the symptoms commonly associated with WNS described in 1.1, and photos of *P.destructans* fungal lesions provided in Appendix I
- Check to see whether there have been any suspect cases in your area by visiting www.bats.org.uk/pages/info_for_batworkers.html

Please also check you have the following with your equipment:

- Field surveillance form and pencil
- Digital camera
- Disposable, single-use gloves
- Sterile fine-tipped swab
- Sealable plastic bags
- A suitable disinfectant (see 1.7)
- Hibiscrub hand cleanser (see 1.7)
- Thermometer (if you have one)
- Humidity reader (if you have one)

2.2 Suggested Good Practice

After visiting a hibernation site, we suggest you:

- Scrape excess mud and soil off boots, clothing and equipment
- Spray your boots with a suitable disinfectant and wash hands with Hibiscrub between site visits
- Complete the field survey form or keep an ongoing record as suggested at 2.4 below (negative results are as important as positive ones)

Please note: BCT does appreciate that there may be situations where it is not practical to undertake full decontamination procedures after each individual site (for example if bat workers are visiting a number of small sites all very close together in one day). We do however ask that you follow these procedures at the end of each day as a minimum and where practically possible take some steps to decontaminate between sites.

2.3 On-site

If, as part of your usual hibernation check activities, you see a **live bat** with a characteristic fungus, and **you are a licensed bat worker**⁶, please follow the procedure below, whilst taking measures to disturb the bat (and other bats at the site) as little as possible.

- Take a digital photo of the affected bat(s)
- Complete the form in Appendix II
- Wearing single-use gloves, take a sample of the external fungus:

⁶ i.e. you are a holder of or registered for a licence that permits disturbance of hibernating bats.

- This sample should be taken using a sterile fine-tipped swab
- with the bat still in a hanging position, gently touch the tip of the fine tipped swab onto the fungus letting only the superficial fungal structures adhere; try to avoid getting soil or other matter mixed in with the sample
- Finally, remove gloves, spray them with disinfectant and dispose of them in a sealed bag

Please note fine tipped swabs are available on request from Alex Barlow at the APHA, these can be requested by telephone 01626 891121 or email alex.barlow@apha.gsi.gov.uk (please make sure you allow plenty of time ahead of your site visit for the swabs to be sent to you). Single swabs are also available from BCT – please contact the helpline on 0345 1300 228.

If you see a **dead bat** with the characteristic white fungus AND it is freshly dead:

- Wearing single-use gloves, carefully carry the bat out of the site and away from any hibernating bats
- Take a digital photo(s) of fungal lesions
- Wearing single-use gloves, take a sample of the external fungus:
 - This sample should be taken using a sterile fine-tipped swab
 - gently touch the tip of the fine-tipped swab onto the fungus letting only the superficial fungal structures adhere; try to avoid getting soil or other matter mixed in with the sample
- Still wearing the gloves, place the bat in a separate sealed bag or container, such as a APHA sample tube (available on request from BCT)
- Finally, remove gloves, spray them with disinfectant and dispose of them in a sealed bag

Please note that only fresh dead bat samples are now tested – unless a large number of dead bats are observed with the characteristic fungus.

If you observe **ANY** of the signs commonly associated with WNS during your site visit, please do not visit any further sites that day and:

- Scrape excess mud and soil off boots, clothing and equipment
- Spray your boots and clothes with a suitable disinfectant
- Wash hands with Hibiscrub, if possible
- Complete the field survey form

Until the status of the finding(s) is confirmed, anyone visiting sites within the region of a suspect case should **carry out the decontamination procedures between site visits**. For the latest information about sites see www.bats.org.uk/pages/info_for_batworkers.html

2.4 Follow-up

Upon returning home, please wash your hands thoroughly with soap and water and either wash your outer clothes, or spray them with a suitable disinfectant (if you have not done this on site already).

If you have seen signs of WNS:

- Please send fungal samples, drawings of fungal lesions (see p. 18) and/or freshly dead suspect bats chilled/frozen to: A M Barlow MRCVS, APHA Starcross Veterinary Investigation Centre, Staplake Mount, Starcross, Devon. EX6 8PE

- Any dead bats should be placed in a sealed package such as a plastic sample tube (available from the BCT helpline on 0345 1300 228).
- The dead bat and/or sample must then be placed in a plastic grip bag
- This should then all be placed in a padded envelope, which should be clearly marked with the code **UN3373** (this is a royal mail request) and additionally marked as “**Suspected White-Nose Syndrome**”, and “Pathological specimen. Handle with care”.
- Write the sender’s name, address and phone number on the rear of the envelope
- Please telephone Alex Barlow first if possible on 01626 891121 or email alex.barlow@apha.gsi.gov.uk / alexmbarlow@btinternet.com.
- Please then submit observational data as soon as possible via our online surveillance form, which can be found at www.bats.org.uk/pages/report_form.html or send the form in Appendix II to BCT at: WNS Team, Bat Conservation Trust, Quadrant House, 250 Kennington Lane, London SE11 5RD or email the form to enquiries@bats.org.uk.

If you **have not** seen any signs of WNS, please mark this on your NBMP hibernation form prior to submission. Or, keep a record of your sites in a spreadsheet with the following column headings and send these to BCT via email to enquiries@bats.org.uk at the end of the survey season:

- Site name
- Site location (including county)
- Grid reference
- Site code (if NBMP site)
- Date of visit
- Confirmation of no signs of WNS

3. Guidelines for unlicensed bat workers checking underground sites for potential use by bats

Please note that only live bats and fresh dead bat samples are now tested – unless a large number of dead bats are observed with the characteristic fungus.

3.1 Preparation

Prior to undertaking a site visit, please:

- Ensure you are familiar with the symptoms commonly associated with WNS described in 1.1, and photos of *P.destructans* fungal lesions provided in Appendix I.
- Check to see whether there have been any suspect cases in your area by visiting www.bats.org.uk/pages/info_for_batworkers.html

Please also check you have the following with your equipment:

- Field surveillance form and pencil
- Digital camera
- Disposable, single-use gloves
- Fine tipped swab
- Sealable plastic bags
- Suitable disinfectant (see 1.7)
- Hibiscrub hand cleanser (see 1.7)

3.2 Suggested Good Practice

After visiting a hibernation site, we suggest you:

- Scrape excess mud and soil off boots, clothing and equipment
- Spray your boots and clothes with a suitable disinfectant and wash hands with Hibiscrub between site visits
- Complete the field survey form or keep an ongoing record as suggested at 2.4 below (negative results are as important as positive ones)

Please note: BCT does appreciate that there may be situations where it is not practical to undertake full decontamination procedures after each individual site (for example if bat workers are visiting a number of small sites all very close together). We do however ask that you follow these procedures at the end of each day as a minimum and where practically possible take some steps to decontaminate between sites.

3.3 On-site

If you see a **dead bat** on the floor with fungal lesions characteristic of *P. destructans*, AND the bat is freshly dead, we ask that you:

- Wearing single-use gloves, carefully carry the bat out of the site and away from any hibernating bats.
- Take a digital photo(s) of fungal lesions.
- Wearing single-use gloves, take a sample of the external fungus:
 - The sample should be taken using a sterile fine-tipped swab

- gently touch the tip of the fine-tipped swab onto the fungus letting only the superficial fungal structures adhere; try to avoid getting soil or other matter mixed in with the sample
- Still wearing the gloves, place the bat in a separate sealed bag or container, such as a APHA sample tube (available on request from BCT)
- Finally, remove gloves, spray them with disinfectant and dispose of them in a sealed bag.

Never take a bat from a hanging position, even if it appears to be dead. Report any unusual observations to the licensed bat worker.

If you see a **live bat** with characteristic fungal lesions:

- Take a photo of the affected individual, taking measures to ensure that disturbance to the bat (and other bats at the site) is minimal.
- Leave the roost immediately and notify BCT of your observation(s).

Please note that as an unlicensed individual, if any signs of bats are observed within a site and you are not accompanied by an appropriately licensed bat worker, you should leave the site immediately.

If you observe **ANY** of the signs commonly associated with WNS during your site visit, please do not visit any further sites that day and:

- Scrape excess mud and soil off boots, clothing and equipment
- Spray your boots, clothes and equipment with a suitable disinfectant
- Wash hands with Hibiscrub, if possible
- Complete the field survey form

Until the status of the finding(s) is confirmed, anyone visiting sites within the region of a suspect case should **carry out the decontamination procedures between site visits**. For the latest information about sites see www.bats.org.uk/pages/info_for_batworkers.html

3.4 Follow-up

If you have seen signs of WNS:

- Please send fungal samples, drawings of fungal lesions (see p. 18) and/or freshly dead suspect bats chilled/frozen to: A M Barlow MRCVS, APHA Starcross Veterinary Investigation Centre, Staplake Mount, Starcross, Devon. EX6 8PE
- Any dead bats should be placed in a sealed package such as a plastic sample tube (available from the BCT helpline on 0345 1300 228).
- The dead bat and/or sample must then be placed in a plastic grip bag
- This should then all be placed in a padded envelope, which should be clearly marked with the code **UN3373** (this is a royal mail request) and additionally marked as “**Suspected White-Nose Syndrome**”, and “Pathological specimen. Handle with care”.
- Write the sender’s name, address and phone number on the rear of the envelope
- Please telephone or email Alex Barlow first if possible 01626 891121 or email alex.barlow@apha.gsi.gov.uk / alexmbarlow@btinternet.com.
- Please then submit observational data as soon as possible via our online surveillance form, which can be found at www.bats.org.uk/pages/report_form.html or send the form in Appendix II to BCT at: WNS Team, Bat Conservation Trust, Quadrant House, 250 Kennington Lane, London SE11 5RD or via email to enquiries@bats.org.uk.

4. Guidelines for volunteers assisting on a site visit

If you are assisting on a site visit, please familiarise yourself with the commonly associated symptoms and photos of fungal lesions in advance of the site visit.

If you suspect any of the symptoms described, notify the licensed bat worker you are with immediately. They will then instruct you regarding decontamination where required.

Appendices

Appendix I: Photo examples of *P. destructans*

Photo examples of *P. destructans* in the UK

	<p>Daubenton's bat: confirmed fungus on ear tip, Kent, 2013</p> <p>Photo courtesy of Shirley Thompson, Kent Bat Group</p>
---	---

Photo examples of *P. destructans* in North America

The images below, and other photographs, can be viewed on the U.S. Geological Society website at: http://www.nwhc.usgs.gov/disease_information/white-nose_syndrome/gallery.jsp

	<p><i>Little brown bats in NY cave.</i></p> <p><i>Photo credit: Al Hicks, NY Dept of Environ. Conservation.</i></p>
	<p><i>Little brown bats in NY hibernation cave. Most of the bats exhibit fungal growth on their muzzles.</i></p> <p><i>Photo credit: Nancy Heaslip, NY Dept of Environ. Conservation.</i></p>
	<p><i>Little brown bat with fungus on muzzle.</i></p> <p><i>Photo credit: Al Hicks, NY Dept of Environ. Conservation.</i></p>



A little brown bat found in a New York cave exhibits fungal growth on its muzzle, ears and wings.

Photo credit: Al Hicks, NY Dept of Environ. Conservation.

PART 4: Observations in relation to suspect fungus (on live bats in situ)	
Bat species	
Ring number (where applicable)	
Body condition (very good / good / moderate / bad / emaciated)	
Outdoor Temperature	
Temperature near animals position	
Humidity near animals position	
No. of individuals in hibernaculum	
No. of individuals with fungal growth <i>(please sketch where you see the fungal lesions using the illustrations overleaf)</i>	
Colour of fungus	
Number of fungal patches	
Size of fungal patches (min and max, in mm)	
Sample taken?*	
Photograph(s) taken?	

***Sampling method** (based on the protocol developed by Leibniz Institute for Zoo and Wildlife Research)

Wearing single-use gloves, and whilst the bat is still in a hanging position, gently touch the visible fungal lesion with the adhesive tape, letting only the superficial fungal structures adhere. Try to avoid getting soil or other matter mixed in with the sample. Gently, press your adhesive tape onto a transparent piece of plastic, for example a food storage bag, making sure there are no air bubbles or gaps between the spore sample and plastic. Taking care not to squash it, store the sample until it can be securely packaged between two bits of card and posted to the APHA.

Alternatively if this site is surveyed as part of the NBMP hibernation surveys please use the fine tipped swab provided by BCT. Please note that additional fine tipped swabs are available from Alex Barlow at the APHA by telephone 01626 891121 or email alex.barlow@apha.gsi.gov.uk (please make sure you allow plenty of time ahead of your site visit for the swabs to be sent to you).

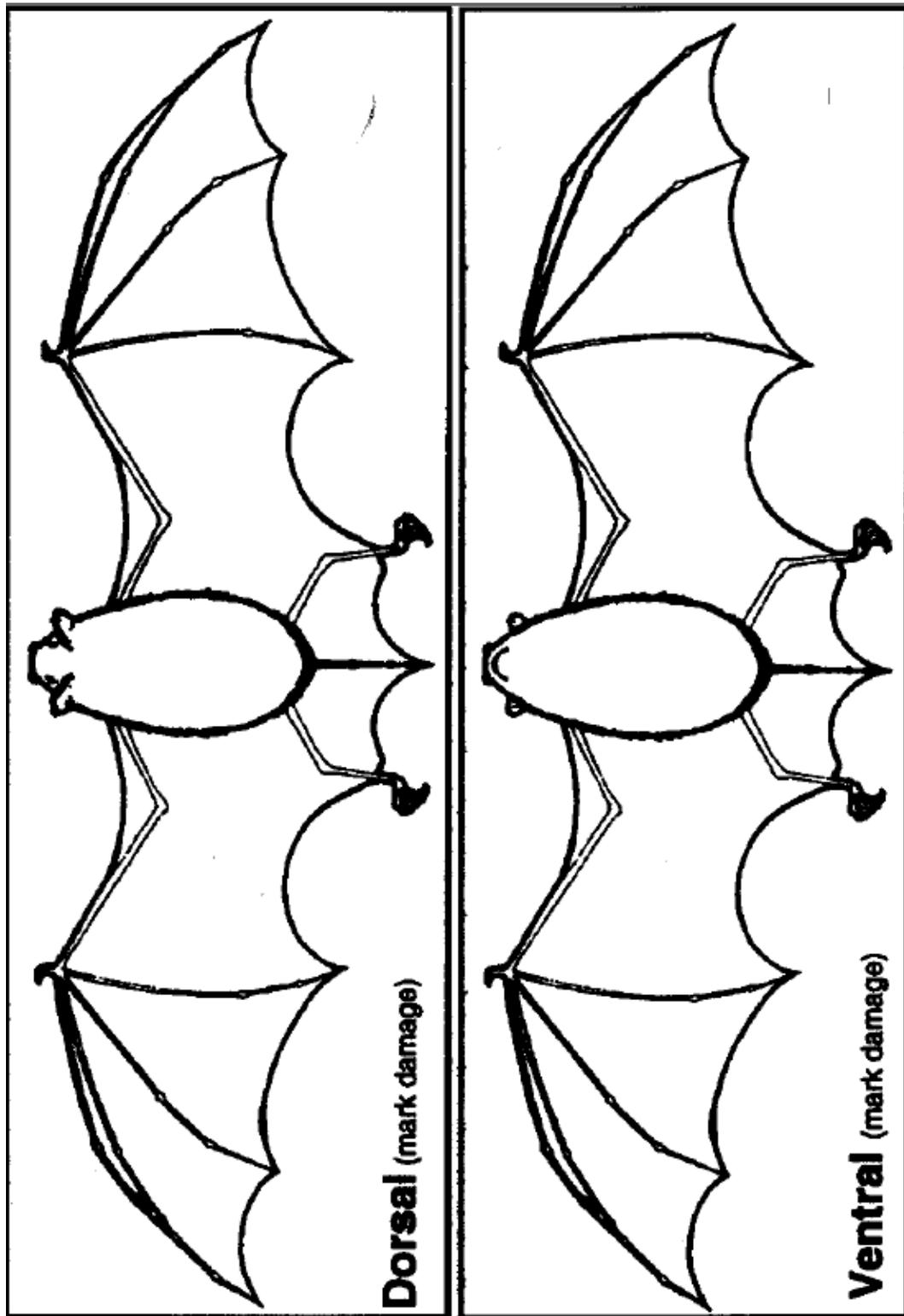
PART 5: Observations in relation to suspect fungus (on dead bats)	
Bat species	
Ring number (where applicable)	
Outdoor Temperature	
Temperature near animals position	
Humidity near animals position	
No. of individuals in hibernaculum	
No. of individuals with fungal growth <i>(please sketch where you see the fungal lesions using the illustrations overleaf)</i>	
Colour of fungus	
Number of fungal patches	
Size of fungal patches (min and max, in mm)	
Sample taken?*	
Photograph(s) taken?	

***Sampling method** (based on the protocol developed by Leibniz Institute for Zoo and Wildlife Research)

Wearing single-use gloves, gently touch the visible fungal lesion with the adhesive tape, letting only the superficial fungal structures adhere. Try to avoid getting soil or other matter mixed in with the sample. Gently, press your adhesive tape onto a transparent piece of plastic, for example a food storage bag, making sure there are no air bubbles or gaps between the spore sample and plastic. Taking care not to squash it, store the sample until it can be securely packaged between two bits of card and posted to the APHA along with the dead bat.

Alternatively if this site is surveyed as part of the NBMP hibernation surveys please use the fine tipped swab provided by BCT. Please note that additional fine tipped swabs are available from Alex Barlow at the APHA by telephone 01626 891121 or email alex.barlow@apha.gsi.gov.uk (please make sure you allow plenty of time ahead of your site visit for the swabs to be sent to you).

Localisation of fungal infection(s) (please mark in the sketch)



If you are a licensed bat worker, and you find a live bat with fungal lesions, please return this page to the APHA with the fungal sample.