CANADIAN WILDLIFE HEALTH COOPERATIVE

CWHC NATIONAL OFFICE

Western College of Veterinary Medicine
52 Campus Dr, Saskatoon, SK S7N 5B4
PH. 1.306.966.5099 EM: info@cwhc-rcsf.ca

Canadian National White-nose Syndrome Decontamination Protocol for entering bat hibernacula

Date: 11 June 2015

Contents

CANADIAN WILDLIFE HEALTH COOPERATIVE

CWHC NATIONAL OFFICE

Western College of Veterinary Medicine
52 Campus Dr, Saskatoon, SK S7N 5B4
PH. 1.306.966.5099 EM: info@cwhc-rcsf.ca

NEW IN THIS VERSION

1. The hot water treatment recommendation changed to 60ºC (140ºF) for 20 minutes.
2. Regarding chemical treatment products, a disclaimer is added to emphasize the importance of following manufacturer's recommendations as stated on the label, for health and safety concerns.
3. The decision tree is simplified.
4. A contact list of regional bat biologists is added to the Appendices.

EXECUTIVE SUMMARY

White-nose Syndrome (WNS) is a fungal disease in bats, causing mass mortality of hibernating bats in eastern North America. It is important to reduce the impact of WNS by ensuring that we do not spread the fungus to new areas. Decontamination of all gear (clothing, footwear and equipment) that may have come in contact with the fungus is essential. Decontaminate after each caving trip and when moving between infected sites more than 10 km apart. Use dedicated clean gear or borrow clean gear when visiting non-affected sites. Take appropriate measures to limit the risk of contaminating your vehicle. Appropriate methods for decontamination of submersible gear is submersion in water that maintains a temperature of at least 60ºC (140ºF) for a minimum of 20 minutes. Non-submersibles can be thoroughly wiped with a chlorine bleach solution or Quaternary ammonium products.

PURPOSE OF THIS DOCUMENT

White-Nose Syndrome (WNS) is devastating Canadian bat populations. Although the primary vector for transmission may be bat-to-bat, the fungus that causes the disease could be spread by people and the gear used to visit bat hibernacula (e.g.: caves, mines and other bat hibernation habitats). THE PURPOSE of this document is to provide recommended guidelines/ best management practices on how you can limit spreading this disease to new areas or between already affected sites. Even bats in areas already affected by WNS may be at risk from additional threats. Little is known about the diversity of the fungus and effects of different strains (variations of the fungus) on bats. Though only one strain of the fungus is known to be in North America, fungi can mutate/change rapidly, possibly with devastating effects to the few bats surviving WNS. For this reason we **recommend to always decontaminate gear** and clothing between hibernacula visits. These ecosystems, including bats, are fragile, unique and

CWHC NATIONAL OFFICE
Western College of Veterinary Medicine
52 Campus Dr, Saskatoon, SK S7N 5B4
PH. 1.306.966.5099 EM: info@cwhc-rcsf.ca

worth preserving. You do not want to risk being the one to spread this disease, killing many more bats, and proper decontamination between hibernacula visits can minimize this risk.

This document offers guidance on practices that minimize the chance of people further moving this fungus to new areas and expanding this epidemic. The recommendations are based on the best available evidence to-date.

HOW TO USE THIS DOCUMENT

The decision tree helps you to determine if there is a need to consider other sections of this document. This document focuses on how to prevent spread from areas already affected by WNS to non-affected areas. Refer to the CWHC website for an up-to-date map on the locations of WNS in Canada.

The background section provides a brief overview of the disease and an introduction to who should decontaminate and why. More technical information can be found at the CWHC website at.

The Section on the **decontamination process** sets out the goals and practices to follow. This section provides information on the goals in case you need to adapt your practices to unexpected situations or variations in local capacity for decontamination. The section "**after hibernaculum visit"** contains recommendations on how to clean and decontaminate your gear, and refers to effective treatment options for decontamination.

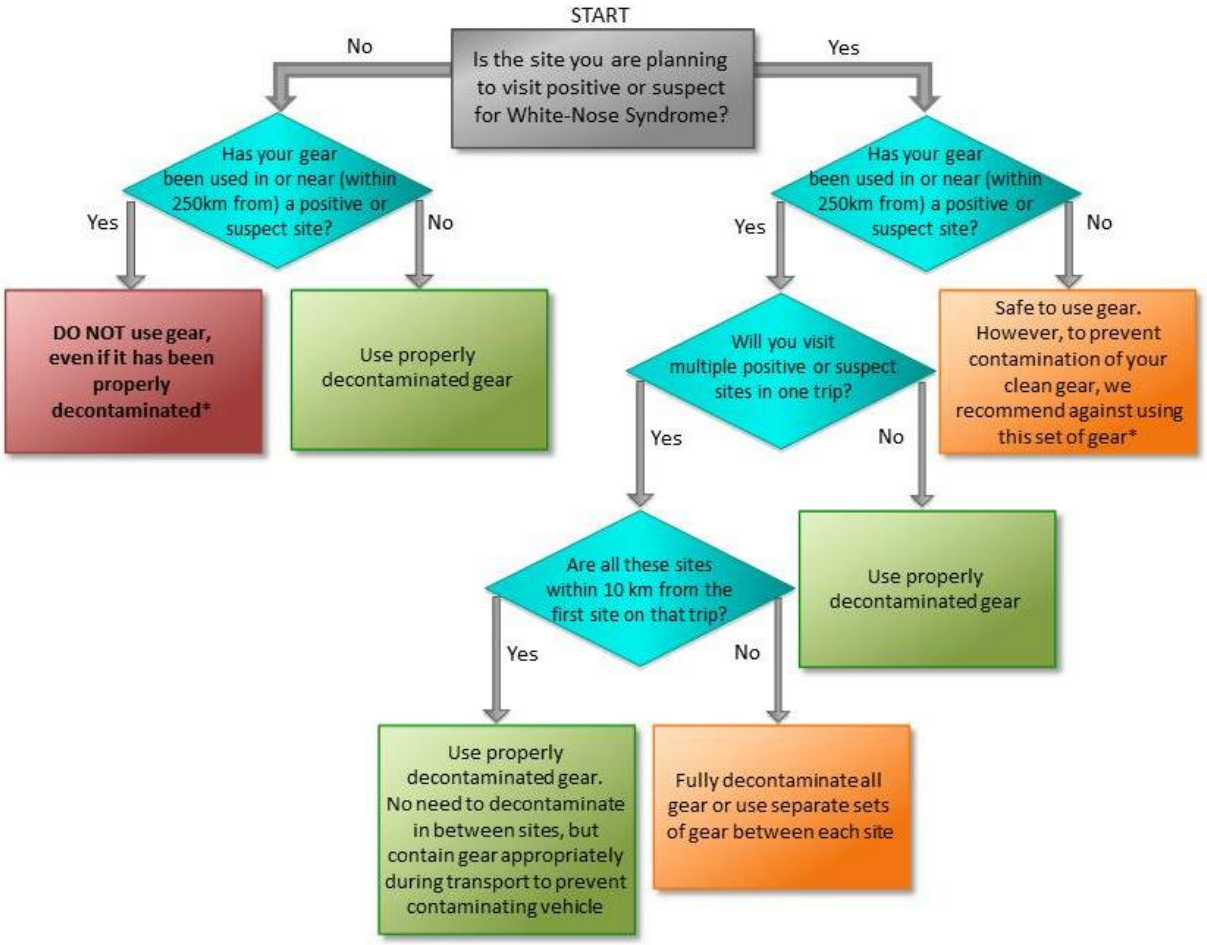
CANADIAN WILDLIFE HEALTH COOPERATIVE

CWHC NATIONAL OFFICE

Western College of Veterinary Medicine
52 Campus Dr, Saskatoon, SK S7N 5B4
PH. 1.306.966.5099 EM: info@cwhc-rcsf.ca

Decision Tree to Determine Gear Use or Decontamination Needs and Practices

Some provinces and federal authorities have closed hibernacula to visits or may require specific protocol prior to visits. Before proceeding to visit a hibernaculum, please check with any applicable provincial or federal regulatory agencies. Where there are no specific procedures or closures that apply, the following decision tree should be followed.



* Recommendation: Use gear that has not previously been used in a White-Nose Syndrome positive area. Contact the regional speleological society in that area to inquire about borrowing clean gear.

Note: When moving between sites within 10 km from the first site, we still recommend to always at least change into clean coveralls for each site.

CWHC NATIONAL OFFICE

Western College of Veterinary Medicine
52 Campus Dr, Saskatoon, SK S7N 5B4
PH. 1.306.966.5099 EM: info@cwhc-rcsf.ca

If you determine from this chart that you should decontaminate your gear and clothing, please see "The Decontamination Process".

Background on White-nose Syndrome

White-nose Syndrome is a disease causing extensive mortality of bats in eastern North America. Named for the white fungus that appears on the muzzle and other parts of hibernating bats, WNS has spread rapidly across the eastern United States and Canada. The cause of this disease is a cold-loving fungus called *Pseudogymnoascus destructans* (*P.d.*).

Bat populations are vulnerable to WNS because they are unable to quickly recover from mass mortality. The *P.d.* fungus grows on bats, and can survive for long periods of time in soil and on a range of different materials. It produces spores (conidia), small units of fungus similar in size to dust, that can cling to surfaces and can be transported to distant locations where they may fall to the ground or onto other substrates.

Bats themselves carry these spores and can spread *P.d*. People may also spread the fungus, simply by visiting or working in an environment where *P.d.* exists. Spores on gear can be transported from place to place in this manner and could introduce *P.d.* to new areas where it will grow and threaten the health of hibernating bats.

Hibernating bat species are those affected by White-nose Syndrome in hibernacula. Hibernacula are the sites where bats spend the winter months to conserve energy. Potential bat hibernacula include, but are not limited to, caves, mines, houses (basements and sometimes attics), rock crevices, wells, bunkers, etc. Anyone entering potential bat hibernacula should be aware of the risks involved in spreading *P.d.* and is encouraged to follow the guidelines in this protocol.

Why Decontaminate?

White-Nose Syndrome has killed millions of bats in North America since 2006, resulting in a 10-fold decline of population numbers. Some of the affected species, once among the most numerous mammals on the continent, are now rare and may become locally extinct in affected areas. Bats are valuable for many different ecological, economic and aesthetic reasons.

The single most important thing any person can do to reduce the impact of WNS is to ensure that he or she does not spread the fungus to new areas. The only way to do this is to decontaminate all gear that may have come in contact with the fungus to prevent it from being transported to a new location.

CANADIAN WILDLIFE HEALTH COOPERATIVE

CWHC NATIONAL OFFICE

Western College of Veterinary Medicine
52 Campus Dr, Saskatoon, SK S7N 5B4
PH. 1.306.966.5099 EM: info@cwhc-rcsf.ca

Who Should Decontaminate?

If you enter potential bat habitat in Canadian provinces that are WNS-positive or suspect, you should decontaminate your gear before going anywhere else that bats might occupy (for the most recent map of the distribution of WNS/*P.d.* in Canada, go to http://www.cwhc-rcsf.ca/data_products_wns.php). White-Nose Syndrome is spreading in Canada and the United States, and it is being spread to new sites within regions where WNS already exists. Decontamination of gear is something that people can do to minimize the spread of WNS, whether you are a tourist, a caver, a scientist, a government official, a mining engineer or a land-owner.

People entering potential bat habitat in western Canada may feel distant from the problem of WNS. However, it is critical to avoid spreading WNS/*P.d.* to these areas. Northern Canada and Newfoundland and Labrador are also unaffected at this time and should be protected from introduction of the fungus by people.

Additional guidelines to avoid spreading *P.d.* to western Canada have been prepared by a consortium of cavers and biologists in BC and Alberta and are available (http://www.cwhc-rcsf.ca/docs/WNS_Western_Transmission_Prevention.pdf).

What Can You Do?

Below, you will find guidelines for decontamination of gear to prevent the spread of the fungus that causes WNS.

- These guidelines provide you with information about how to treat gear so that no living fungus (*P.d.*) remains and the gear has the least chance of spreading the fungus to new locations when used in these new locations.
- As new information becomes available, these guidelines will be revised to provide the most up-to-date information possible.

Laws, Rules and Personal Responsibilities

On some lands in Canada there may be firm rules or restrictions to site entry. Know the local laws and regulations before entering potential bat habitat. In most situations, however, each person must evaluate the potential risks of spreading *P.d*. that are associated with his or her activities, and make an appropriate decontamination decision.

To evaluate the risk your actions may pose for White-Nose Syndrome:

CWHC NATIONAL OFFICE
Western College of Veterinary Medicine
52 Campus Dr, Saskatoon, SK S7N 5B4
PH. 1.306.966.5099 EM: info@cwhc-rcsf.ca

- Be informed: read the pages of the CWHC website and visit the White-Nose Syndrome website of the US Fish and Wildlife Service.
- Look at the most recent map of the known distribution of *P.d.* in North America (http://www.cwhc-rcsf.ca/data_products_wns.php), and locate your planned activities on this map.
- Call your provincial bat biologist (Appendix I) and confer about risks associated with spread of WNS.
- Read the decontamination guidelines provided in this document and consider how you can work these into your activities.

Decontamination Products for Use in Canada

Testing of the effectiveness of various chemicals and processes for decontamination of gear against spores of *P.d.* is incomplete at present. Some testing of products sold in the United States has been done and further testing is underway on products available specifically in Canada. The results of these tests will be added to the guidelines below as they become available. Many products are manufactured for use only on non-porous surfaces (hard surfaces) and carry no product guarantees for use on porous surfaces (e.g. clothing).

CANADIAN WILDLIFE HEALTH COOPERATIVE

CWHC NATIONAL OFFICE

Western College of Veterinary Medicine
52 Campus Dr, Saskatoon, SK S7N 5B4
PH. 1.306.966.5099 EM: info@cwhc-rcsf.ca

THE DECONTAMINATION PROCESS

GOALS

Prevent the spread of *P.d.* by:

1. Planning ahead to match your actions with the local risk of spread
2. Using protective gear to prevent contamination of personnel and gear in known or suspected contaminated sites
3. Limiting transfer of spores from infected sites to non-infected sites
4. Removing spores from gear
5. Inactivating spores still present on gear

PLAN AHEAD BEFORE EACH HIBERNACULUM VISIT

1. KNOW THE RISK
    a. Determine the *P.d.* /WNS status[1] of the location where your gear was previously used.
    b. Determine the *P.d.* /WNS status[1] of the location to be visited.
    c. Contact local provincial/federal regulatory or land management agencies to determine additional requirements for site visits.

2. MANAGE YOUR GEAR USE
    a. If possible, have dedicated gear – one set to use between contaminated sites only and one clean set to use at non-contaminated sites, or simply do not enter hibernacula that require such gear. Many types of rope and webbing have not been thoroughly tested for integrity after decontamination. Reminder: **Safety equipment must never be treated with chemicals, temperature modifications, or manual treatments that have not been approved by the manufacturer.**
    b. Choose gear that can be most effectively decontaminated (keeping in mind what items can be submerged in hot water and what cannot).
    c. When planning to enter hibernacula in non-contaminated areas, contact the regional speleological society to inquire about borrowing clean gear, if you don't have dedicated clean gear yourself.

3. PLAN TO DEAL WITH POTENTIALLY CONTAMINATED GEAR

[1]Visit http://www.cwhc-rcsf.ca/data_products_wns.php for the most up-to-date WNS status of a county or province/territory

CWHC NATIONAL OFFICE
Western College of Veterinary Medicine
52 Campus Dr, Saskatoon, SK S7N 5B4
PH. 1.306.966.5099 EM: info@cwhc-rcsf.ca

a. Bring bags – Isolate (quarantine) all gear not decontaminated on site at the hibernaculum entrance, in a sealed plastic bag or container, to be cleaned and disinfected off-site. Wet bags with disinfectant and seal in an additional bag before placing in vehicle to ensure the vehicle does not become contaminated.
b. Prepare a strategy (i.e., how/where all gear and waste materials will be contained, stored, treated and/or discarded after returning to your vehicle/base area) for cleaning and treatment of gear.
c. Where possible, clean and decontaminate all gear between each separate hibernaculum visit. If you must visit known *P.d.* contaminated sites or sites likely to be contaminated with *P.d.* without the possibility to decontaminate or change gear in between, visit these sites after you have visited sites for which the presence of *P.d* or WNS is unknown or not detected, to further reduce the risk of carrying *P.d* to new locations.

4. Remember, any gear that was used in a WNS-affected location should not be used in a WNS-unaffected area. Decontamination may not be 100% effective; thus, decontaminated gear should not be assumed to be free from *P.d.* spores.

CLOTHING AND EQUIPMENT TO FACILITATE DECONTAMINATION

The following clothing and equipment guidelines are mostly aimed at bat researchers in hibernacula. However, we do encourage everybody entering bat habitats to consider these recommendations and apply if appropriate.

1. Wear overalls of adequate size over clothes. When visiting multiple sites, bring a clean set of overalls for each site.

2. We recommend wearing disposable, Tyvek® coveralls over all other layers on each site visit. These suits do not prevent layers worn underneath from getting contaminated, but will minimize contamination and make decontamination easier and more reliable. Do not reuse suits as they are easily ripped when crawling through small spaces in caves and mines. Tyvek suits are comfortable and relatively cheap. Discard the Tyvek® suit in a sealed, plastic bag and spray with disinfectant and return for disposal. When Tyvek® coveralls rip or none are worn over clothing; take extra care when cleaning layers underneath. Wear clothing resistant to submerging in at least 60ºC water for a minimum of 20 minutes (see “After each hibernaculum visit”) or chemical disinfectants.

3. Wear caving or similar helmet with light source. The hood of Tyvek® suit can be worn up over the hair under helmet. Loose hair should be tied back.

Western College of Veterinary Medicine
52 Campus Dr, Saskatoon, SK S7N 5B4
PH. 1.306.966.5099 EM: info@cwhc-rcsf.ca

4. Wear a pair of clean boots, preferably rubber boots, which have a surface that is easy to clean. Wear boots with rain suit cuffs (gaiters) outside the top (and Tyvek® suit cuffs outside that). Do not tuck garments into boots. Before leaving site remove boots and rain cuffs and contain in sealed bags for later decontamination. Do not wear those boots or cuffs again until properly disinfected and put on (different) clean footwear when leaving the site.

5. Wear gloves at all times inside hibernacula, and while handling potentially contaminated gear outside. Pull gloves up over Tyvek® suit at wrists. Bats should not be handled without the proper permits, vaccinations and training. Carry an ample supply of clean gloves of appropriate sizes, inside a plastic bag. When handling bats, wear disposable nitrile gloves. Researcher should remove and discard gloves in a plastic bag after handling a bat. Put on a new uncontaminated pair of gloves before handling the next bat, or equipment such as a camera. **Degloving:** with gloved fingers, grasp the exterior of glove near wrist (without touching skin) and pull off, inverting the glove so that contaminated exterior ends up on the interior of glove once removed. Remove the second glove by slipping your fingers inside the wrist and inverting the contaminated external surface as you pull the glove off. **Regloving:** handling the exterior of the clean glove near the wrist, and using bare fingers, pull on first glove. Repeat using the gloved hand to pull on second glove.

6. Bring disposable or washable plastic or other impervious bags for transport of cameras. For easy cleaning, use a waterproof camera.

7. Bring disposable, impervious, sealable plastic bags for bagging contaminated gear.

AFTER EACH HIBERNACULUM VISIT

ON SITE:

1. **REMOVE DIRT:** It is essential to remove mud and sediment first to facilitate effective decontamination (Shelley et al. 2013). Do this immediately upon exiting the hibernaculum (e.g. with a bristle brush), and before gear is sealed for transport and further decontamination.

2. **DISCARD DISPOSABLES SAFELY:** All used, disposable gloves, Tyvek® coveralls are discarded in a plastic garbage bag which is then sealed and sprayed with disinfectant and returned for disposal.

Western College of Veterinary Medicine
52 Campus Dr, Saskatoon, SK S7N 5B4
PH. 1.306.966.5099 EM: info@cwhc-rcsf.ca

3. **CONTAIN MATERIAL TO BE DISINFECTED OFF SITE:** Isolate all gear not decontaminated on site at the hibernaculum entrance, in sealed plastic bags or containers, to be cleaned and disinfected off-site. **DON'T CONTAMINATE THE VEHICLE**: Reduce the risk of vehicle contamination and transport of *P.d*. to new areas by making sure to:

   A. Transport gear in clean containers.
   B. Remove outer clothing/footwear and isolate in a sealed plastic bag or container prior to entering a vehicle. Storage container options vary considerably depending on the type of vehicle; but **always clean and disinfect the outside surfaces of storage containers prior to putting them in the vehicle**.
   C. Remain outside of the vehicle after exiting a hibernaculum or completing field work until you have changed and cleaned.
   D. Change (outer layer) into clean clothing and footwear prior to entering the vehicle.

      Note: for additional safety measures, non-porous surfaces inside the vehicle can be wiped with Lysol (or similar) wipes, after removing contained gear from the car for decontamination.

OFF SITE:

4. **CLEAN** submersible and non-submersible gear according to approved manufacturer's specifications. Laboratory trials (Shelley et al. 2013) demonstrate that the use of conventional cleansers like Woolite® detergent and Dawn® dish soap aid in the removal of dirt and organic debris prior to treatment with a disinfectant contributes to the overall effectiveness of the disinfection. Pressure washers at car washes are not recommended for safety gear because of the potential contact of petrochemical products with the equipment. Once cleaned, rinse gear thoroughly in water. Clean/treat gear used in a suspect or confirmed location prior to transport when traveling back to or through a province **without** known cases of *P.d.*/WNS. Waste water should be considered contaminated; however, risks of *P.d.* contaminated water are not known and currently no guidelines for waste water disposal are in place. Try to dispose of waste water in a manner least likely to contaminate gear, vehicles or the environment.

5. **DISINFECT** Table 1 summarizes appropriate treatment products for decontamination of submersible, non-submersible, porous and non-porous gear.

   A. **<u>Submersible gear</u>** (i.e., clothing, footwear, and/or equipment that can be submerged in liquid)**:**

The preferred treatment for all submersible gear is complete submersion in water that maintains a temperature of at least 60ºC (140ºF) for a minimum of 20 minutes.

CWHC NATIONAL OFFICE
Western College of Veterinary Medicine
52 Campus Dr, Saskatoon, SK S7N 5B4
PH. 1.306.966.5099 EM: info@cwhc-rcsf.ca

Alternatively, Some submersible gear (depending on material) may be soaked for a minimum of 10 minutes in the appropriate products listed in Table 1, rinsed thoroughly with water, and air dried overnight.

Note: Although commercially available washing machines with sanitation cycles often sustain desired water temperatures**;** their efficacy for killing *P.d.* spores is untested.

B. **<u>Non-submersible gear</u>** (i.e., electronics, and/or other gear that may be damaged by liquid submersion):

Chemical treatment options for non-submersible gear include:

1. **Household chlorine bleach solution** (e.g. Javex®, other brands of sodium hypochlorite 5-6% solution) diluted to 10% by volume (1 part bottled bleach solution, 9 parts water).
2. **Quaternary ammonium products** containing at least 0.3% ammonium quaternary compounds. Testing of efficacy of quaternary ammonium products available in Canada (Appendix II) is in progress. *Until these results are available we recommend using the hot water treatment and quaternary ammonium wipes (e.g., Lysol wipes) as much as possible.*

Gear that is not approved for disinfection should be dedicated to individual sites.

*Note: The effectiveness of alcohol based disinfectants, such as wipes and hand wash, for destroying P.d. spores has **not** been fully tested.*

See Appendix III for links to additional WNS and decontamination sources.

REMEMBER, the product label is the law!

It is the responsibility of the users of this protocol to read and follow the product label and MSDS.

Products must be used in accordance with the label:

Ensuring the safety of those who use any of the here mentioned products for treatment is of utmost importance. Material safety data sheets (MSDS) developed by product manufacturers provide critical information on the physical properties, reactivity, potential health hazards, storage, disposal, and appropriate first aid procedures for handling or working with substances in a safe manner. Familiarization with MSDS for chemical products prior to use will help to ensure appropriate use of these materials and assist in emergency response.

CWHC NATIONAL OFFICE
Western College of Veterinary Medicine
52 Campus Dr, Saskatoon, SK S7N 5B4
PH. 1.306.966.5099 EM: info@cwhc-rcsf.ca

It is a violation of federal law to use, store, or dispose of a regulated product in any manner not prescribed on the approved product label and associated MSDS.

Disinfectant products, or their contaminated rinse water, should be managed and disposed of as per product label directions to avoid contamination of ground water, drinking water, or non-municipal water features such as streams, rivers, lakes, or other bodies of water. Follow all local, provincial and federal laws. Note: Quaternary ammonium wastewaters should not be drained through septic systems because of the potential for system upset and subsequent leakage into groundwater.

CANADIAN WILDLIFE HEALTH COOPERATIVE

CWHC NATIONAL OFFICE

Western College of Veterinary Medicine
52 Campus Dr, Saskatoon, SK S7N 5B4
PH. 1.306.966.5099 EM: info@cwhc-rcsf.ca

Table 1: Treatment options for decontamination of non-porous and porous surfaces (adapted from U.S. National White-Nose Syndrome Decontamination Protocol)[2,3,4]. See Appendix II for comparable products available in Canada.

		Preferred Treatment	Other Treatments				
	PRODUCT	**Submersion in Hot Water**	**Clorox® (6% HOCl) Bleach**	**Lysol® IC Quaternary Disinfectant Cleaner**	**Professional Lysol® Antibacterial All-purpose Cleaner**	**Formula 409® Antibacterial All-Purpose Cleaner**	**Lysol® Disinfecting Wipes**
APPROVED USES	**Hard, non-porous surfaces**	Yes	Yes	Yes	Yes	Yes	Yes
	Non-porous personal protective safety equipment	Yes	No	Yes (headgear, goggles, rubber boots, etc.)	No	No	No
	All surfaces, including: porous clothing, fabric, cloth footwear	Yes	Yes (do not use on ropes, harnesses or fabric safety equipment)	No	No	No	No
	DILUTION/ TREATMENT (as per label)	Effective at sustained temperatures ≥ 60°C (140°F) for 20 minutes	Effective at 1:9 dilution (bleach : water) for 10 minutes	Effective at 1:128 dilution (1 ounce: 1 gallon of water) for 10 minutes	Effective at 1:128 dilution (1 ounce: 1 gallon of water) for 10 minutes	Effective at concentrations specified by label for 10 minutes	Effective at 0.28 % di-methyl benzyl ammonium chloride for 10 minutes

Other effective disinfectant(s) with similar chemical formulas (e.g., a minimum of 0.3% quaternary ammonium compound) or water based applications may exist and are currently being tested

[2] The use of trade, firm, or corporation names in this protocol is for the information and convenience of the reader. Such use does not constitute an official endorsement or approval by provincial and/or federal agencies of any product or service to the exclusion of others identified in the protocol that may also be suitable for the specified use.

[3] Product guidelines should be consulted for compatibility of use with one another before using any decontamination product. Also, detergents and quaternary ammonium compounds (i.e., Lysol® IC Quaternary Disinfectant Cleaner) should not be mixed directly with bleach as this will inactivate the bleach and in some cases produce a toxic chlorine gas. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

[4] Final determination of suitability for any decontaminant is the sole responsibility of the user. Use of some treatments which utilize such method need to be applied carefully, especially in confined spaces, due to inhalation or contact risks of the product. All users should be aware of these risks

CANADIAN WILDLIFE HEALTH COOPERATIVE

CWHC NATIONAL OFFICE

Western College of Veterinary Medicine
52 Campus Dr, Saskatoon, SK S7N 5B4
PH. 1.306.966.5099 EM: info@cwhc-rcsf.ca

Appendix I – Contact list of Provincial Biologists

Province	Name	Phone number	E-mail address
Newfoundland and Labrador	Shelley Pardy	709-637-2018	shelleypardy@gov.nl.ca
Nova Scotia	Mark Elderkin	902-679-6219	Mark.Elderkin@novascotia.ca
Prince Edward Island	Garry Gregory (until Spring 2015)	902-569-7595	ggregory@gov.pe.ca
New Brunswick	Karen Vanderwolf Don McAlpine	506-643-7280 506-643-2345	kjvanderw@gmail.com donald.McAlpine@nbm-mnb.ca
Quebec	Ariane Masse	418-627-8694 ext. 7310	ariane.masse@mffp.gouv.qc.ca
Ontario	Chris Heydon	705-755-5378	chris.heydon@ontario.ca
Manitoba	Craig Willis	204-786-9433	c.willis@uwinnipeg.ca
Alberta	Lisa Wilkinson Margo Pybus	780-723-8556 780-427-3462	lisa.wilkinson@gov.ab.ca margo.pybus@gov.ab.ca
British Colombia	Helen Schwantje Purnima Govindarajulu	250-953-4285 250-387-9755	Helen.schwantje@gov.bc.ca Purnima.govindarajulu@gov.bc.ca
Northwest Territories	Joanna Wilson	867-873-7588	joanna_Wilson@gov.nt.ca
Nunavut	Lenny Shirose	866-673-4781	lshirose@uoguelph.ca

CANADIAN WILDLIFE HEALTH COOPERATIVE

CWHC NATIONAL OFFICE

Western College of Veterinary Medicine
52 Campus Dr, Saskatoon, SK S7N 5B4
PH. 1.306.966.5099 EM: info@cwhc-rcsf.ca

Appendix II – Canadian products

Quaternary ammonium products containing at least 0.3% ammonium quaternary compounds are effective at killing fungal spores of P.d. Quaternary ammonium products must be used at the label dilution for safe use. (Note: The Lysol Professional cleaning products listed by the U.S. National White-Nose Syndrome Decontamination protocol [Table 1] are not available in Canada, according to the manufacturer Reckitt Benckiser). A selection of products containing quaternary ammonium compounds available in Canada, include:

A. **ASEPTOL 2000 S.E.C. Repro Inc.**
http://www.secrepro.com/en/sanitary/aseptol_2000.php

B. **EP51B Av-mixx Avmor**
http://www.avmorgreen.com/English/products.php?cat=1

C. **Aqua San Zep Inc.**
http://webfiles.acuitysp.com/MSDS/2410_1_EN1_CDN.PDF

D. **Vanguard 256 Dustbane Products Ltd.**
http://www.dustbane.ca/msds/english/Vangard%20256_en.pdf

E. **Dyna Quat Plus Zep Inc.**
http://webfiles.acuitysp.com/psrCanada/psr_q161.*PDF*

F. **Clinicide (Bimeda-MTC Animal Health Inc.)**
http://www.bimedamtc.com/bimeda-products - go to: “disinfectant”

G. **Virocid CID Lines**
http://www.belgagri.com/images/store/files/1272_VIROCID_FDS_FR.pdf

H. **Avmor Ecopure EP66**
http://www.avmor.com/files/prods/efab1159448063.pdf

CANADIAN WILDLIFE HEALTH COOPERATIVE

CWHC NATIONAL OFFICE

Western College of Veterinary Medicine
52 Campus Dr, Saskatoon, SK S7N 5B4
PH. 1.306.966.5099 EM: info@cwhc-rcsf.ca

Appendix III – Further Information

This document will be revised as new research and developments come available. It is recommended you refer to documents online to ensure you are reviewing the most up to date version. Additional information can be found at:

- Please consult the U.S. Fish and Wildlife Service website on WNS at: https://www.whitenosesyndrome.org//
- The U.S. National White-Nose Syndrome Decontamination Protocol https://www.whitenosesyndrome.org/sites/default/files/resource/national_wns_revise_final_6.25.12.pdf
- For more information about White-Nose Syndrome in Canada: http://www.cwhc-rcsf.ca/wns
- Other informative websites regarding White-Nose Syndrome: http://batcon.org/index.php/what-we-do/white-nose-syndrome.html