

White-Nose Syndrome Decontamination Protocol - Version 03.15.2012

I. GENERAL INFORMATION:

The fungus *Geomyces destructans* (*G.d.*) is the cause of white-nose syndrome (WNS), a disease that has devastated populations of hibernating bats in eastern North America. Since its discovery in New York in 2007, WNS has spread rapidly through northeastern and mid-Atlantic states and now to the Midwest and eastern Canada, and continues to threaten bat populations across the continent. For the protection of bats and their habitats, we strongly recommend compliance with all current cave and mine closures, advisories, and regulations on the federal, state, tribal, and private lands you plan to visit. In the absence of cave and mine closure policy, or when planned activities involve close/direct contact with bats, their environments, and/or associated materials, the following decontamination procedures should be implemented to **reduce the risk of transmission** of the fungus to other bats and/or habitats. For the purposes of clarification, the use of the word “decontamination,” or any similar root, in this document entails both the 1) cleaning and 2) disinfection of exposed materials in a way that is safe to both human and animal health. **Under no circumstances should clothing, footwear or equipment that was used in a WNS-affected state or region be used in a WNS- unaffected state or region.** Some state/federal regulatory or land management agencies have supplemental documents that provide additional requirements or exemptions on lands under their jurisdiction to those provided herein. All supplemental material for state and federal agencies can be found at: <http://www.whitenosesyndrome.org/>

If you observe live or dead bats (multiple individuals in a single location) that appear to exhibit signs of WNS, contact a wildlife professional in your nearest state (<http://www.fws.gov/offices/statelinks.html>) or federal wildlife agency (<http://www.fws.gov/offices/>, <http://www.fs.fed.us/>, <http://www.blm.gov/wo/st/en.html>, or <http://www.nps.gov/index.htm>). **Please do not handle bats unless properly trained, vaccinated for rabies, and permitted to do so by the appropriate government agency.**

II. KNOWN DECONTAMINANTS¹:

Disinfectants/Applications

While other disinfectant(s) with similar chemical formulas (e.g., a minimum of 0.3% quaternary ammonium compound, etc.) or water based applications may exist, laboratory testing has determined that the following options are known to kill the conidia of *G.d* when employed for a minimum of 10 minutes, unless specified.

- Submersion in hot water - Effective at sustained temperatures $\geq 50^{\circ}\text{C}$ (122°F) for **15 minutes**^{2,3}
- Lysol[®] IC Quaternary Disinfectant Cleaner - Effective at 1:128 dilution, or 1 ounce of concentrate per gallon of water^{2,3}
- Professional Lysol[®] Antibacterial All-purpose Cleaner - Effective at 1:128 dilution, or 1 ounce of concentrate per gallon of water^{2,3}
- Formula 409[®] Antibacterial All-Purpose Cleaner - Effective at concentrations specified by label^{2,3}
- Clorox[®] (6% HOCl) Bleach - Effective at 1:10 dilution (bleach : water)^{2,3,4}
- Lysol[®] Disinfecting Wipes - Effective at 0.28 % di-methyl benzyl ammonium chloride^{2,3}

¹ Reference herein to any specific commercial products, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government.

² 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.

³ 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 prior to entering cave environments and understand that products and corresponding procedures may cause irreversible harm. Always use personal protective equipment to reduce contact with these products, particularly when recommended by the manufacturer.

⁴ Do not store bleach solution for more than 24 hours as the solution will begin to break down once diluted and/or exposed to sunlight.

Safe Use of Decontaminants

Ensuring the safety of those who use any of the above chemicals is of utmost importance. Material safety data sheets (MSDS) are developed by chemical-product manufacturers to 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 disinfectants prior to use will help to ensure safe use these materials and improve emergency response.

It is the responsibility of the users of this protocol to read and follow the labeled instructions provided on the products outlined in this section. 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.

Always remember the following:

- Reference the product label and MSDS prior to use of product to:
 - Avoid dangerous/volatile situations; know reactivity and stability of products.
 - Know appropriate first aid measures
 - Ensure adequate ventilation
 - Wear personal protective equipment: respiratory, hands, skin, body, and eye protection
 - Develop a spill plan and prepare a spill kit
 - Ensure secondary containment (incidental spill prevention such as a catchment basin or tub)
- Follow all local, state and federal laws (i.e., state-by-state requirements for product disposal may vary. Disinfectant chemicals, or their contaminated rinse water, should be prevented from entering any ground or non-municipal water feature such as streams, rivers, lakes, or other body of water).

III. BIOSECURITY/DECONTAMINATION PROCEDURES¹:

Before Each Cave/Mine or Site Visit:

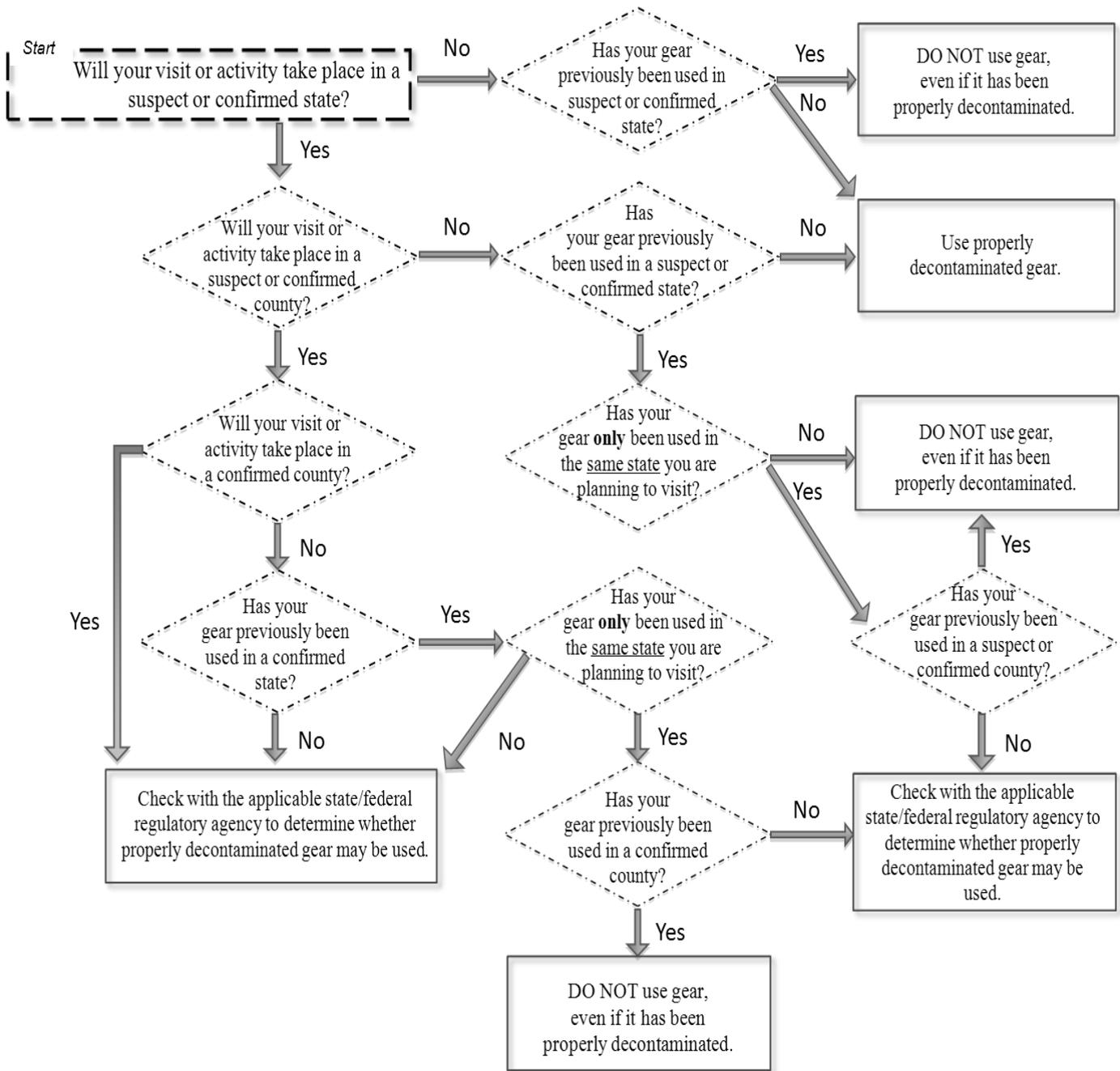
- 1.) Exercise care when selecting the appropriate gear⁵ for use on your cave/mine visit or bat research site. Choose gear that can be most effectively decontaminated (i.e., rubber wellington type vs. leather boots) or dedicated to a specific location. **Remember, under no circumstances should any gear that was used in a WNS-affected state or region be used in a WNS-unaffected state or region.** Brand new gear can be used at any location where access is otherwise permitted.
- 2.) Determine G.d./WNS status⁶ of the state/county(s) where gear was previously used.
- 3.) Determine G.d./WNS status⁶ of state/county(s) to be visited.
- 4.) Determine whether gear is permitted for your cave/mine visit or bat related activity, as defined by the current WNS case definitions⁷ and the flowchart below.
- 5.) Determine if any state/federal regulatory or land management agency addendum or supplemental document⁸ provides additional requirements or exemptions on lands under its jurisdiction that supplement the final instruction identified in the flowchart below.

⁵ In this document, “gear” refers to any clothing, footwear, and/or equipment.

⁶ Visit <http://www.fws.gov/whitenosesyndrome/maps.html> to determine the WNS status of a county or state.

⁷ Visit http://www.nwhc.usgs.gov/disease_information/white-nose_syndrome/wns_definitions.jsp for current WNS case definitions.

⁸ To find applicable addenda and/or supplemental information, visit <http://www.whitenosesyndrome.org/topics/decontamination>



6.) When visiting multiple caves/mines or bat research sites on the same day, decontaminate all gear according to the applicable disinfectant(s)/application(s) listed in Part II between **each** cave/mine/site, **unless** otherwise directed in an agency addendum. It is recommended that known confirmed or suspect caves/mines be visited only after those sites of unknown G.d. status have been visited, to further reduce the risk of inadvertent transmission.

7.) Prepare a decontamination strategy (i.e., how and where all gear and waste materials will be stored, treated and/or disposed of after returning to your vehicle and base area) for your particular circumstances that provides for decontamination of gear on a daily basis **unless** instructed above to decontaminate gear more frequently throughout the day.

After Each Cave/Mine or Site Visit:

- 1.) Thoroughly scrub and remove sediment/dirt from clothing, footwear, and other gear immediately upon leaving the cave/mine or bat research site. Mild soaps, as detailed below, can be used for this step, as can many of the cleansers identified in Part II.
- 2.) Disinfect gear by using the appropriate disinfectant(s)/application(s) listed in Part II for a minimum of 10 minutes, unless otherwise noted. All gear not decontaminated on site should be isolated (quarantined) in a sealed plastic bag or container to be cleaned and disinfected off-site. Precautions should be taken to avoid contamination of vehicles, and exposed gear should be stored separately from unexposed gear. Gear used in a suspect or confirmed state should be decontaminated prior to transport when traveling back to or through a state **without** known cases of G.d./WNS.

A.) Submersible Gear (i.e. clothing, footwear, and/or equipment that can be submerged in liquid):

I.) Clothing, footwear, and submersible equipment:

Once fully scrubbed and rinsed of all soil and organic material, clothing, footwear, and any appropriate equipment should be machine or hand-washed using a conventional cleanser like Woolite[®] detergent or Dawn[®] antibacterial dish soap, respectively, in water (the use of Dawn[®] antibacterial dish soap is not intended for use in conventional washing machines.) Once cleaned, gear should be rinsed thoroughly in water, soaked for a minimum of 10 minutes in the appropriate disinfectant(s)/ application(s) from Part II, rinsed thoroughly in water again, and air dried. If submersing gear in hot water for use as the primary disinfectant/application, then recognize all gear must be **submersed in water of at least 50°C (122°F) for a minimum of 15 minutes**. Note: Although commercially available washing machines with sanitation cycles often sustain desirable water temperatures to properly disinfect gear, the use of these machines for disinfection should not occur until the efficacy for killing the conidia of G.d. can be demonstrated.

B.) Non-submersible Gear:

Gear that may be damaged by liquid submersion should be cleaned according to the manufacturer's recommendation, when appropriate, using soap (e.g. Dawn[®] antibacterial dish soap) and water, AND disinfected using the most appropriate disinfectant(s)/application(s) in Part II and allowed to air dry.

I.) Ropes, Harnesses, and Other Vertical Equipment:

Rope and webbing, other than specific types manufactured by the Sterling Rope company, have not been tested for integrity after exposure to these decontamination procedures and therefore should be dedicated to a single cave/mine or not used at all (cave/mine requiring use should not be entered). All ropes, harnesses and soft components of equipment used for building anchor systems (e.g., "quick draws," cams, cordelletes, etc.), and personal vertical gear (e.g., slings, rope for Prusiks, etc.) should, at a minimum, be cleaned to the manufacturer's specifications after each use, regardless of their dedication or re-use status at a location.

Sterling Rope's rope (Sterling Superstatic or HTP) and stitched webbing (Sterling tubular 1" webbing) were tested, and the following decontamination procedure has been recommended: Wash rope/webbing in a front loading washing machine on a delicate (cold) cycle using Woolite[®] detergent (at the manufacturer's recommended concentration); remove and place rope/stitched webbing in a 1:128 diluted Lysol IC[™] Quaternary Disinfectant Cleaner for 15 minutes; rinse two more times in clean water; and allow to air dry. Strength testing results are available at: <http://www.caves.org/WNS/Sterling%20Results.pdf>. Users should consult Sterling Rope for more information regarding the safety and applicability of this procedure on their product.

II.) Cameras and Electronic Equipment:

Until effective techniques are developed to comprehensively disinfect cameras and electronics, it is recommended that these items only be used when absolutely necessary. Regardless of the cave/mine visited, cameras and electronics should be decontaminated after each visit using the most appropriate disinfectant/application in Part II. If practical, equipment that must be used in the cave/mine may be placed in a sealed plastic casing (i.e., underwater camera housing), plastic freezer bag, or plastic wrap that permits proper operation of the equipment (i.e., glass lens is exposed) and further reduces the risk of exposure to the environment. Prior to opening or removing any plastic protections, wipe the outside surfaces with an appropriate disinfectant(s)/application(s) described in Part II. Plastic freezer bag or wrap should be removed and discarded after each visit. A sealed plastic casing may be reusable (refer to step 4 in Part III) if properly submersed in one of the disinfectant(s)/application(s) from Part II and the functionality and protective features of the casing have not been sacrificed (check with manufacturer). After removal of any outside plastic protection, all non-submersible equipment surfaces (i.e., camera body, lens, etc.) should be wiped using the appropriate disinfectant(s)/application(s) in Part II.

3.) Reduce the risk of unintentional vehicle contamination and transport of *G.d.* to new areas by taking precautions to transport gear in clean containers, conduct all work outside of the vehicle after exiting a cave/mine or completing necessary field work, changing into clean clothing and footwear prior to entering the vehicle, and clean dirt and debris from the outside of vehicles (especially wheels/undercarriage). At a minimum, outer clothing and footwear should be removed and isolated in a plastic bag or container prior to entering a vehicle. Storage options vary considerably depending on the type of vehicle; but **always clean and disinfect the outside surfaces of storage containers prior to putting them back in the vehicle.**

Note: Protocol updated as of 03.15.2012