

Memorandum of Understanding among the United States Fish and Wildlife Service, the West Virginia Division of Natural Resources' Wildlife Resources Section and the Smithsonian's National Zoological Park

I. Authority

This Memorandum of Understanding (MOU) between the U.S. Department of the Interior, U.S. Fish and Wildlife Service (USFWS), the State of West Virginia, Division of Natural Resources' Wildlife Resources Section (WVDNR) and the Smithsonian's National Zoological Park (SNZP), hereafter "the Cooperators," is entered into under the authority of the Fish and Wildlife Coordination Act (16 U.S.C. 661) and the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

II. Purpose

White Nose Syndrome (WNS), a newly-emerging disease that has killed more than one million bats in the northeastern United States since 2006, is spreading and represents a significant extinction threat to the Virginia big-eared bat, *Corynorhinus townsendii virginianus* (VBEB). This MOU establishes a collaborative framework to: (1) establish a security population of VBEB at SNZP's Conservation and Research Center, near Front Royal, Virginia; and (2) generate health and husbandry procedures critical to the captive management of the VBEB and other insect-eating bats at risk from WNS.

III. Background

The VBEB, a subspecies of the Townsend's big-eared bat (*C. townsendii*), is listed as endangered by the USFWS. This non-migratory bat (perhaps numbering ~15,000 individuals) lives in caves year-round in West Virginia, Virginia, Kentucky and North Carolina. Four genetically-distinct subpopulations are distributed throughout regions in northeastern West Virginia, southern West Virginia, eastern Kentucky and western Virginia/North Carolina. The northeastern West Virginia subpopulation is the largest and hibernates in seven caves located in Tucker, Pendleton and Grant counties in West Virginia and Highland County, Virginia. Caves in this region also support approximately 77% of the range-wide maternity population. Historically, the primary threats to the VBEB have been human disturbance, loss of habitat, and possibly decreased access to foraging sites. The recent spread of WNS represents a substantial threat to extant VBEB populations that could lead to irreversible, catastrophic effects, including extinction.

Because WNS recently has been identified in West Virginia and Virginia, the threat to the endangered VBEB is of high concern. If the spread of WNS continues, populations in Kentucky and North Carolina also will be at risk. Recognizing the substantial threat that WNS represents to the continued existence of the VBEB, the Cooperators agree to establish the first captive security population for this subspecies. This captive population will: (1) serve to ensure the continued existence of VBEB; (2) provide time for scientists and managers to address and alleviate WNS impacts and identify measures to restore the suitability of affected cave environments for VBEB; and (3) serve as a resource for restoring VBEB populations in the wild.

IV. Roles and Responsibilities

(i) U.S. Fish and Wildlife Service

1. In cooperation with the WVDNR, identify capture locations, and conduct collection, transport, and delivery of the apparently clinically healthy specimens.

2. Obtain necessary permits for bat capture and transportation across the state line between West Virginia and Virginia.
3. Coordinate with the WVDNR and other Cooperators to determine and implement appropriate disposition or release of any captive-held or -raised VBEB.

(ii) West Virginia Division of Natural Resources' Wildlife Resources Section

1. In cooperation with the USFWS, identify capture locations, and conduct collection, transport, and delivery of the apparently clinically-healthy specimens.
2. Coordinate with the USFWS and other Cooperators to determine and implement appropriate disposition or release of any captive-held or -raised VBEB

(iii) Smithsonian's National Zoological Park

1. Construct an enclosure that is suitable for maintaining VBEB at the SNZP's Conservation and Research Center (CRC).
2. Plan, develop and implement appropriate captive husbandry and health management protocols to sustain a viable captive population of VBEB.
3. Communicate with USFWS and WVDNR on the progress of the project via telephone conference at least every 90 days. Summarize and share notes of call with all Cooperators.
4. As described by an Interagency Agreement between USFWS and SNZP, submit a written report to USFWS and WVDNR every 12 months on population numbers, health status and modification of standard operating procedures.
5. Offer project results and photos to USFWS, WVDNR, and others as necessary and disseminate appropriate findings to scientific community through publication in peer-reviewed journals and to the public through other appropriate measures.

(iv) Shared responsibilities

1. All Cooperators will be acknowledged in local and national media releases regarding the project.
2. Each Cooperator will obtain written permission from the appropriate Cooperator before using any other Cooperator's name or logo in any promotional and fundraising activities.
3. The Cooperators recognize that routine communication and sharing of information will be critical to project success. All Cooperators will strive to share new information and developments with each other regarding WNS and/or bat husbandry that may affect the success of this effort or the long-term recovery of VBEB.

V. Scope

(i) Ownership of the bats

All bats secured from the wild as founders of the captive population(s) and all of their progeny shall remain the property of the state from which they were collected.

(ii) Initial genetic assessment and health examinations upon bat arrival at CRC and after an appropriate acclimation period

1. To determine the level of genetic variations in the founder population, biological samples will be collected, processed and stored per the recommendations provided by the USFWS.
2. All bats will be individually identified, first using a temporary marker to be followed by subcutaneous, electronic transponders (PIT tags).
3. All bats will receive a complete physical examination, likely under gas anesthesia, and will be screened for enteric pathogens and parasites, skin fungal organisms and rabies virus.

(iii) Husbandry Protocols

1. SNZP will care for all bats according to specific husbandry protocols that include standard operating procedures for diets, sanitation, behavioral observation and health management. Initial protocols will be developed prior to the establishment of the captive population and agreed to by the Cooperators
2. Protocols will be modified and refined as new information is obtained. SNZP will notify USFWS and WVDNR of all modifications as these occur.

(iv) Health Intervention

1. Medical treatments and therapeutic or diagnostic interventions will be at the professional discretion of SNZP animal care team.
2. SNZP will inform the WVDNR and USFWS prior to euthanasia of any bats, except in the event of an acute emergency where animal suffering must be immediately terminated.

(v) Necropsy Protocol

1. SNZP will conduct full post-mortem examinations on all bats that die or are euthanized.
2. Preliminary and final post-mortem reports will be completed by SNZP, and copies of these reports will be provided to WVDNR and USFWS.
3. Tissue and specimen samples taken during necropsy will belong to SNZP. Any tissues or remaining parts of the carcass not needed for the postmortem diagnostics and not considered to have high potential for disease transmission belong to WVDNR and will be transferred to a third party under the advice of WVDNR and USFWS.

(v) Bio-security agreement

1. All bats will be housed under strict permanent quarantine conditions.

2. Access to the bats will be restricted to responsible SNZP animal care and veterinary staff. State and USFWS biologists and other bat experts may also be granted access when appropriate to evaluate the project and provide technical advice.
3. All bats will be tested and vaccinated for rabies by SNZP veterinary staff.
4. SNZP staff assigned to work with the bats will be vaccinated against rabies virus following extant SNZP protocols. Vaccinations and subsequent health clearances will be performed by the Smithsonian Institution's human health care personnel.
5. In the event that SNZP staff are bitten, clinically healthy bats will not be sacrificed for rabies testing, but will be closely monitored. Bats showing neurologic signs or signs of illness consistent with rabies will be euthanized for official rabies testing.

(vi) Project Risks

Although the goal of this project is to have minimal VBEB mortality, the Cooperators acknowledge that this project carries substantial risks and that significant bat mortality may occur. The project will be considered successful as long as new information and knowledge are generated regarding best husbandry and health guidelines for insectivorous bats in captivity, regardless of mortality events.

VII. Limitations

1. Each Cooperator agrees to bear responsibility for his/her acts or omissions and hold harmless the other parties from such acts or omissions.
2. The MOU does not create any joint venture, agency relationship or legal partnership between the Cooperators.
3. The MOU may be revised, as necessary, by the issuance of a written amendment that is signed and dated by all Cooperators.
4. Each Cooperator grants all other Cooperators a non-exclusive, royalty-free and irrevocable license to use research and works written or prepared by such Cooperator related to this project for educational and research purposes, with appropriate credit given to the Cooperator who wrote or prepared such research or work.
5. Additional organization(s) may be added as a Cooperator(s) in this MOU by the issuance of a written amendment that is signed and dated by all Cooperators.
6. The term of this MOU is two years from the date of execution by the last Cooperator. If the parties mutually agree and funding is available, the project may be extended. Each Cooperator may terminate this MOU by providing 30 days written notice to other Cooperators. Upon the termination of this project, all bats will be returned to WVDNR within 30 days after the project termination.
7. During the performance of work undertaken pursuant to the MOU, any supplements hereto, or any specific agreement entered into pursuant to the authority of this MOU, the Cooperators

shall not discriminate on the grounds of race, color, religion, sex, national origin, age, disability, marital status, or political affiliation.

VIII. Effective date

IN WITNESS WHEREOF, the Cooperators hereto have executed this MOU as of the last written date below.

FOR THE U.S. FISH AND WILDLIFE SERVICE

Deborah Carter 10/23/2009

Deborah Carter

Date

Field Supervisor

FOR THE WEST VIRGINIA DIVISION OF NATURAL RESOURCES

Frank Jezioro 10/24/09

Frank Jezioro

Date

Director, West Virginia Division of Natural Resources

FOR THE SMITHSONIAN'S NATIONAL ZOOLOGICAL PARK

Mary R. Tanner 11/3/2009

Steve Monfort

Date

Acting Director