

Wildlife Health Bulletin 2021-02

National Wildlife Health Center

Jonathan Sleeman, Center Director

December 7, 2021

SARS-CoV-2 and North American Wildlife

Summary

- The USGS National Wildlife Health Center is working with the Centers for Disease Control and Prevention to assess the prevalence of SARS-CoV-2 and the diversity of other coronaviruses in North American wildlife.
- NWHC will be working with partners to collect and test samples from elevated-risk wildlife groups.
- Currently, there is no evidence that wildlife is a source of SARS-CoV-2 infection for people in the United States.

Background

As SARS-CoV-2, the virus that causes COVID-19 in humans, continues to spread globally, questions have emerged about the potential for humans to transmit the virus to North American wildlife, its potential effects on native wildlife populations, and the resultant possibility and consequences of establishing a persistent wildlife reservoir. Recent studies have detected SARS-CoV-2 in escaped or wild mink and white-tailed deer ([Chandler et al. 2021](#), [Hale et al. 2021](#), [Ip et al. 2021](#), [Kuchipudi et al. 2021](#), [Shriner et al. 2021](#)), suggesting that more One Health work, including more widespread surveillance for zoonotic transmission of SARS-CoV-2 at the human-wildlife interface and spread in North American wildlife is warranted.

The USGS National Wildlife Health Center (NWHC) has recently entered into a partnership with the Centers for Disease Control and Prevention One Health Office (CDC) to assess the prevalence of SARS-CoV-2 and the diversity of other coronaviruses in North American wildlife. We are also coordinating surveillance with the U.S. Department of Agriculture, who is partnering with states to sample and test cervids. As part of this work, NWHC and CDC will use a One Health approach to develop a risk assessment to identify high risk interfaces for human-wildlife transmission of SARS-CoV-2.

Planned Surveillance

To begin assessing coronavirus diversity in wildlife and help inform the risk assessment we have initiated pilot work with partner agencies to collect and test samples from wildlife for SARS-CoV-2 and other coronaviruses. The first stage of surveillance will focus on samples of convenience (i.e., those where NWHC or partner agencies will already be accessing wildlife), and species and situations where there may be an elevated risk of human to wildlife transmission. We are not requesting any additional submissions outside of our standard submission guidelines from partner agencies at the current time. All positive test results will be reported to partner agencies as well as the CDC using established communication protocols. We will also be available to assist partners with interpretation and communication of results.

If your agency prefers that wildlife carcasses from morbidity/mortality events submitted to NWHC for diagnostic evaluation not be sampled for SARS-CoV-2 and other coronaviruses, please let us know either ahead of time or at the time of submission.

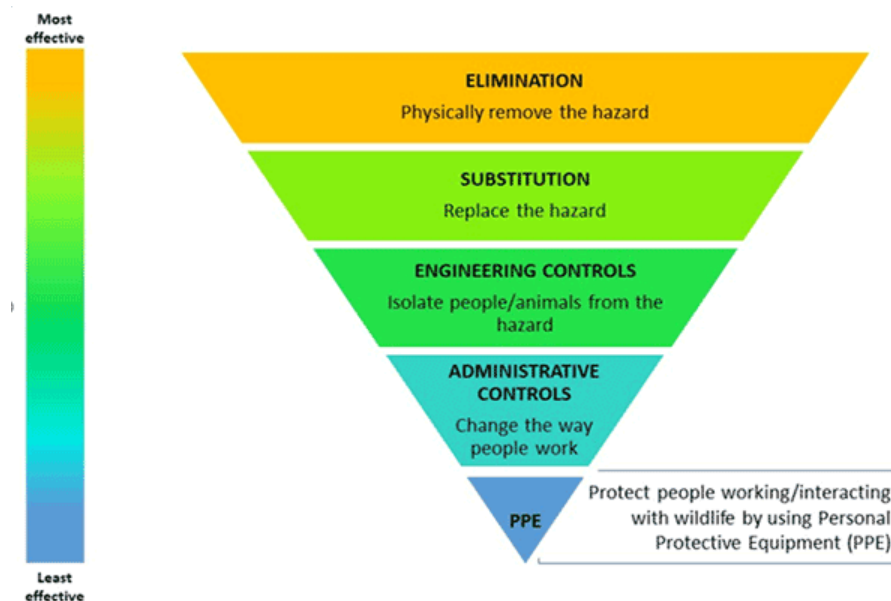
While our surveillance strategy will be adapted as the science around SARS-CoV-2 increases, our current plans include:

- Sampling wildlife carcasses submitted to NWHC as part of typical mortality event investigations
- Working with partner agencies to collect samples of convenience
 - Focusing on wildlife groups with an elevated risk of infection (e.g., mustelids, felids, rodents, microchiropterans, procyonids, castorids, ursids, cetaceans, and pinnipeds)
 - Focusing on situations where there may be an elevated risk of exposure from humans
- Working with partner agencies and laboratories who may be able to collect appropriate samples while conducting their own necropsies
- Potentially working with select wildlife rehabilitators (when approved by the permitting agencies) to collect samples from relevant wildlife species upon intake

Currently, there is no evidence that wildlife is a source of infection for people in the United States. However, we are aware of the potential impacts of negative perceptions on wildlife conservation efforts, particularly when the pathogen of interest affects humans (see [MacFarlane and Rocha 2020](#)). Therefore, we are also actively working to develop communication strategies that put risk in context and to balance wildlife conservation with disease concerns. Guidance to assist interested partners is [available on our website](#).

Reducing Risk

The CDC's "[Reducing the Risk of SARS-CoV-2 Spreading between People and Wildlife](#)" provides guidance tailored to the most common types of wildlife interactions likely to occur among the public, hunters, wildlife rehabilitators, and natural resource agencies. Given the variety of potential wildlife interactions for natural resource agencies, the CDC suggests the use of a Hierarchy of Controls framework and suggests that risk mitigation actions correspond to the degree of risk associated with the type of activity and length of exposure during those activities.



The Hierarchy of Controls is a standard tool applied in occupational safety and health practices to minimize exposure to hazards by implementing effective control solutions. (Credit: CDC.)

Our partnership with the CDC to assess SARS-CoV-2 and other coronaviruses in wildlife will be a multi-year endeavor and we plan to provide regular updates to our partners. This important work could not be accomplished without the assistance and support of partner natural resource agencies. We want to take this opportunity to thank our partners for their interest in One Health and wildlife disease issues and their continued support.

References

Chandler JC, Bevins SN, Ellis JW, Linder TJ, Tell RM, Jenkins-Moore M, Root JJ, Lenocho JB, Robbe-Austerman S, DeLiberto TJ, Gidlewski T, Kim Torchetti M, Shriner SA. 2021. SARS-CoV-2 exposure in wild white-tailed deer (*Odocoileus virginianus*). Proc Natl Acad Sci 118(47):e2114828118. <https://doi.org/10.1073/pnas.2114828118>

Hale VL, Dennis PM, McBride DS, Nolting JM, Madden C, Huey D, Ehrlich M, Grieser J, Winston J, Lombardi D, Gibson S, Saif L, Millian ML, Lantz K, Tell R, Torchetti M, Robbe-Austerman S, Nelson MI, Faith SA, Bowman AS. 2021. SARS-CoV-2 infection in free-ranging white-tailed deer (*Odocoileus virginianus*). bioRxiv 2021.11.04.467308v1. <https://doi.org/10.1101/2021.11.04.467308>.

Ip HS, Griffin KM, Messer JD, Winzeler ME, Shriner SA, Killian ML, K. Torchetti M, DeLiberto TJ, Amman BR, Cossaboom CM, Harvey RR, Wendling NM, Rettler H, Taylor D, Towner JS, Barton Behravesh C, Blehert DS. 2021. An opportunistic survey reveals an unexpected coronavirus diversity hotspot in North America. *Viruses* 13(10):2016. <https://doi.org/10.3390/v13102016>

Kuchipudi SV, Surendran-Nair M, Ruden RM, Yon M, Nissly RH, Nelli RK, Li L, Jayarao BM, Vandegrift KJ, Maranas CD, Levine N, Willgert K, Conlan AJK, Olsen RJ, Davis JJ, Musser JM, Hudson PJ, Kapur V. 2021. Multiple spillovers and onward transmission of SARS-CoV-2 in free-living and captive white-tailed deer. bioRxiv 2021.10.31.466677. <https://doi.org/10.1101/2021.10.31.466677>

MacFarlane D and Rocha R. 2020. Guidelines for communicating about bats to prevent persecution in the time of COVID-19. *Biological Conservation* 248:108650. <https://doi.org/10.1016/j.biocon.2020.108650>

Shriner SA, Ellis JW, Root J, Roug A, Stopak SR, Wiscomb GW, Zierenber, JR, Ip, HS, Torchetti, MK, Deliberto, TJ. 2021. SARS-CoV-2 Exposure in Escaped Mink, Utah, USA. *Emerg Infect Dis.* 27(3):988-990. <https://doi.org/10.3201/eid2703.204444>

Disease Investigation Services

To request diagnostic services or report wildlife mortality, please contact the USGS National Wildlife Health Center at 608-270-2480, by email at NWHC-epi@usgs.gov, or through the Wildlife Health Information Sharing Partnership – event reporting system ([WHISPers](#)) interface and a field epidemiologist will be available to discuss the case. To report wildlife mortality events in Hawaii or Pacific Island territories, please contact the Honolulu Field Station at 808-792-9520 or email Thierry Work at thierry_work@usgs.gov.

Further information about our services can be found at <https://www.usgs.gov/centers/nwhc/science/disease-investigation-services>. To learn more about submitting samples and reporting events, go to <https://www.usgs.gov/centers/nwhc/science/report-mortality-events-and-submit-specimens>. The [WHISPers](#) system can also be used to enter event information, request diagnostic services, and to view and search summary information on wildlife morbidity/mortality events. If you have questions or concerns regarding the scientific and technical services we provide, please do not hesitate to contact NWHC Director Jonathan Sleeman at jsleeman@usgs.gov.

WILDLIFE HEALTH BULLETINS are distributed to natural resource/conservation partners to provide and promote information exchange about significant wildlife health threats. Past [Wildlife Health Bulletins](#) are available on our website. If you would like to be added to or removed from the mailing list for these Bulletins, please visit https://listserv.usgs.gov/mailman/listinfo/usgs-nwhc_outreach or email nwhcoutreachdb@usgs.gov.