

# Association of Fish & Wildlife Agencies

## Guidance on SARS-CoV-2 and Free-Ranging White-Tailed Deer



ASSOCIATION of  
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*Prepared by the Fish and Wildlife Health Committee  
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***This guidance document is intended to be adaptable as new information becomes available. It was developed for AFWA member states and is not meant to be prescriptive or to mandate programs at the state, provincial, federal, tribal, or territorial level; the guidance and supporting evaluations should be regarded as recommendations for agencies to consider as they make policy involving wildlife and SARS CoV-2.***

Based on results from recent studies, white-tailed deer (WTD) are susceptible to experimental infections with SARS-CoV-2 (Palmer et al. 2021). This virus can also be transmitted for a short-time interval between WTD housed or comingled indoors. Infected WTD do not become ill, and they shed infective virus for a relatively short duration. Given potential for infection by other cervids and ungulates due to the presence of the ACE2 receptor and amino acids important for the binding between receptor and virus (Damas et al. 2020), biological considerations and transmission mechanisms of SARS-CoV-2, similar outcomes could be expected in other cervid species, although confirmatory research is needed. Susceptibility and transmission results such as these are important first steps to better understand a new disease, but alone these results are inadequate to predict outcomes in free-ranging populations or for estimating transmission risk to humans or other animals.

There are two potential transmission risk scenarios that may be of concern to stakeholders and biologists: 1) humans acting as a source of infection to WTD and 2) SARS-CoV-2 infected WTD acting as a source for human infection. As humans currently represent the major reservoir for SARS-CoV-2 and no evidence exists that this virus is present in wild WTD or other free-ranging wildlife populations in North America, the risk of transmission from a wild WTD to humans should not be of concern. The potential for reverse zoonosis from humans to WTD, however, may be valid, particularly in contexts such as rehabilitation, wildlife exhibition, and captive animal research where humans and WTD may interact in close proximity for extended periods of time. Resources referenced at the end of this document provide additional guidance on risk mitigation strategies for such situations where humans will be in close contact with live WTD for extended periods of time.

For a virus such as SARS-CoV-2 to become established in free-ranging WTD or for WTD to become a significant source of infection for humans, several additional but very important steps must occur. (1) The virus must be introduced to and infect a wild WTD, (2) it must be efficiently transmitted between WTD, and (3) it must be maintained in the population through continuous WTD to WTD transmission.

- (1) **Introduction:** Humans, not animals, are the most important and only recognized reservoir for SARS-CoV-2. The potential for close direct contact and transmission between an infected human and a living free-ranging WTD is limited. The risk of human to WTD SARS-CoV-2 transmission can be greatly reduced using the standard precautions (masks, hygiene) that are effective in preventing SARS-CoV-2 transmission between humans. Transmission risk from human to WTD can be reduced to near zero if a person is vaccinated. Note vaccination may not be recommended for immunocompromised people. Frequent human/WTD contacts in rehabilitation, captive/farmed, zoo, or research settings represent areas where preventive measures should be emphasized. See the hierarchy of controls model in CDC guidelines referenced at the end of the document for further risk reduction measures in rehabilitation and research settings.

- (2) **Transmission:** For WTD to WTD transmission to occur, several things need to be considered. First, a virus that transmits in an indoor experiment in small confinement rooms may not transmit or be much less transmissible under actual field conditions. This is especially true with viruses such as SARS-CoV-2 that are primarily transmitted by infective droplets or aerosols. In humans, transmission by these routes is more efficient indoors. Second, transmission between WTD, based on results observed in experimental studies, occurs during a relatively short time span when WTD are shedding virus (<7days) and in close contact (Palmer et al. 2021). Such close contact between WTD may be possible within small groups, although it is unlikely this would be an efficient means for this virus to spread through a larger deer population under natural conditions. Although the environmental stability of SARS-CoV-2 is low, we cannot discount the possibility that transmission between WTD could be enhanced where WTD receive and share supplemental feed sources. Risk of transmission where WTD are held in high density captive or farmed conditions also may be elevated.
- (3) **Maintenance:** Without an opportunity for introduction, an efficient natural or artificial (e.g., supplemental feeding) transmission mechanism, and close and frequent connectivity between WTD within a free-living population, it is unlikely that SARS-CoV-2 would spread efficiently or be maintained in free-ranging WTD. At this time, no one can conclude, based on existing science, that the risk of SARS-CoV-2 entering, efficiently transmitting within, or persisting in a WTD or any other wildlife population is zero. However, based on what we know about WTD viral diseases and biology, this appears to be a very low risk. The fact remains COVID-19 is a human disease that is maintained in a human reservoir.

To reiterate, there is no evidence that *wild* WTD have been or are infected with SARS-CoV-2. Direct human contact with WTD obviously occurs most often with hunters. If a hunter is concerned about the risk of severe or fatal COVID-19 from handling a harvested deer, this risk can be greatly reduced, if not eliminated, through personal vaccination. Note vaccination may not be recommended for immunocompromised people.

#### Relevant Resources:

- Link to CDC guidelines for reducing the risk of SARS-CoV-2 spread between people and wildlife: <https://www.cdc.gov/coronavirus/2019-ncov/your-health/wildlife.html>
- Recent issue of SCWDS Briefs with a relevant article: <https://vet.uga.edu/wp-content/uploads/2021/02/2021-January-SCWDS-Briefs-Newsletter.pdf>

#### Literature Cited:

Damas, J., Hughes, G.M., Keough, K.C., Painter, C.A., Persky, N.S., Corbo, M., Hiller, M., Koepfli, K.P., Pfenning, A.R., Zhao, H. and Genereux, D.P., 2020. Broad host range of SARS-CoV-2 predicted by comparative and structural analysis of ACE2 in vertebrates. *Proceedings of the National Academy of Sciences*, 117(36), pp.22311-22322.

Palmer, M.V., Martins, M., Falkenberg, S., Buckley, A., Caserta, L.C., Mitchell, P.K., Cassmann, E.D., Rollins, A., Zyllich, N.C., Renshaw, R.W. and Guarino, C., 2021. Susceptibility of white-tailed deer (*Odocoileus virginianus*) to SARS-CoV-2. *Journal of virology*, 95(11), pp.e00083-21.