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

Wildlife health and SARS-CoV-2 in Canada: Bats

Interim guidance for wildlife management agencies

Version 1.2, dated: 11 March 2021

Executive summary

The susceptibility of all Canadian wildlife to SARS-CoV-2 is not known, but case reports indicate that some species are susceptible to infection. The health of North American bat species is of particular concern due to white-nose syndrome already threatening bat populations. **A precautionary approach is advised to protect bats from potential infection with SARS-CoV-2 until more information is available**.

The goal of this document is to provide recommendations to federal, provincial, territorial, and other wildlife agencies and staff to manage and reduce the risk of transmission of SARS-CoV-2 to bats while also helping ensure that the COVID-19 pandemic does not lead to inappropriate measures taken against wildlife species or populations, or negatively impact wildlife conservation. **Currently, the Canadian Wildlife Health Cooperative (CWHC) recommends that only handling of wild bats deemed important for bat conservation be conducted in Canada until the risks associated with SARS-CoV-2 are better understood.**

Precautionary approaches:

- It is recommended that research requiring handling of, or close proximity to, wild bats that is deemed important for bat conservation is conducted with the use of appropriate Personal Protective Equipment (PPE), and that bat handling activities not deemed important for bat conservation be postponed.
- For bat rehabilitation, risk assessments should be done on a case-by-case basis to assess whether a centre can accept and release bats. Handling staff should wear appropriate PPE and ideally test negative for COVID-19 prior to intake and release of bats.
- If individual bats need to be removed from buildings, wildlife management and permitting agencies should perform a risk assessment, if resources are available, to decide if the bat should be released, rehabilitated, or euthanized. When individual risk assessments are not possible, jurisdictional messaging should be developed that balance human health, bat health, and available resources to best guide public response to bats inside living spaces.
- If close proximity to bats is occurring for an important project, recommended PPE includes at least: use of nitrile gloves, appropriate masks or respirators designed to filter **exhaled** particles, and long-sleeved disposable or washable coveralls. Additional prevention strategies that should be adopted include proper hand and respiratory hygiene.

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

This document will be reviewed and modified when new information is available.

Preface

This document is intended to be informative, not directive, and provide jurisdictional wildlife managers and agencies with the best available information and recommendations relating to Canadian bats and their potential susceptibility to SARS-CoV-2. While we recommend a precautionary approach regarding hands-on work with bats, these guidelines are not meant to prohibit handling of bats, but are meant to encourage careful consideration of important activities and safest handling practices to minimize risk of disease transmission. Wildlife managers and agencies must use their own judgement in deciding what is allowable, considering in each situation whether handling of bats is important for bat conservation or management purposes.

Overview

COVID-19 is a respiratory disease of humans caused by the novel coronavirus SARS-CoV-2. This disease is spreading rapidly via human-to-human transmission and was declared a global pandemic by the World Health Organization (WHO) on March 11, 2020. The virus is closely related to coronaviruses identified in horseshoe bats (*Rhinolophus* sp.), but further investigations are needed to determine the source of SARS-CoV-2 and determine how the virus entered human populations. There have been reports of several animal species with natural or experimental infection of SARS-CoV-2, including but not limited to: mink, domestic cats, dogs, big cats, ferrets, white-tailed deer, hamsters, monkeys, tree-shrews, deer mice, and Egyptian fruit bats, with potential for disease transmission to conspecifics in many cases. More information, including answers to Frequently Asked Questions about COVID-19 and animals, is available from the COVID-19 web page of the World Organization for Animal Health (OIE).

At this time, susceptibility of all North American wildlife species to infection or disease caused by SARS-CoV-2 is not known. However, the possibility exists that a range of wildlife species could be susceptible and that their infection could negatively impact wildlife health and conservation, especially for species already impacted by other threats. Infection of wildlife could also create additional challenges for human public health. Thus, in keeping with the precautionary principle, **the goal of these recommendations is to reduce the risk of transmission to bats while also helping ensure that the COVID-19 pandemic does not lead to inappropriate measures taken against bat species or populations, or negatively impact bat conservation.**

This is a dynamic situation, and new information about SARS-CoV-2 is becoming available at a rapid pace. These recommendations will be updated as often as is reasonably possible based on the latest available evidence. While this document focuses on North American bats, the World Organisation for Animal Health (OIE) provides broader guidelines for working with free-ranging wild mammals.

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

SARS-CoV-2 and bats in Canada

The following recommendations are intended to provide federal, provincial, territorial, and other wildlife agencies with support in making management decisions that protect bat health. Each agency should issue its own jurisdictional guidance that can reasonably be applied with the respective agency's available resources, using the latest available evidence. **The CWHC recommends a precautionary approach:** activities that require handling of or close proximity to wild bats that are deemed important for bat conservation and management are conducted with the use of appropriate PPE, and that bat handling activities not deemed important for bat conservation be postponed **until the risks associated with SARS-CoV-2 and bat species are better understood**. It is not known whether all Canadian bat species are susceptible to infection with SARS-CoV-2, whether the virus could contribute to bat mortality, or whether bats could potentially act as reservoirs of SARS-CoV-2 in North America. Hall *et al*. (2020) found no evidence of SARS-CoV-2 infection in big brown bats (*Eptesicus fuscus*) through experimental infection, but does warn that susceptibility of other bat species remains to be investigated. Many North American bat populations are already under severe pressure due to their susceptibility to white-nose syndrome (WNS). To understand the potential threat to bats from SARS-CoV-2, a rapid-risk assessment was conducted by the United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS), and the Association of Fish and Wildlife Agencies (AFWA) (Runge *et al*. 2020). According to Runge *et al*. (2020), transmission risk from humans to bats is non-negligible, but proper use of appropriate PPE (see below) is expected to drastically reduce, although not eliminate, the risk.

Handling of wild bats for research purposes

To protect the health of both at-risk and non-listed bat species, it is recommended that research requiring handling of, or close proximity to, wild bats that is deemed important for bat conservation or management by the respective governmental wildlife management agency is conducted with the use of appropriate PPE and other precautions (see below), and that bat handling activities not deemed important for bat conservation be postponed. It is beyond the scope of this document to discuss specific criteria for important work, however, agencies should consider how the outcomes of the research could contribute to mitigating or managing an acute threat to bats.

Proper use of PPE is expected to decrease the risk of infection to bats. If activities requiring direct contact with bats are deemed important for bat conservation or management, to protect bats from potential infection, PPE should be used to protect bats specifically from exposure to SARS-CoV-2. We recommend following the Government of Canada's guidelines for health professionals and the guidance provided by Runge *et al*. (2020). PPE required to prevent exposure of bats to SARS-CoV-2 differs from the PPE that many researchers will already be familiar with for preventing spread of WNS and rabies transmission. At a minimum, PPE for preventing potential spread of SARS-CoV-2 to bats should include: use of nitrile gloves, Government of Canada or CDC recommended medical or cloth face masks designed to filter **exhaled** particles (note: standard N95 respirators or other respirators with exhalation valves are

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

designed to protect the wearer and are not appropriate), and long-sleeved disposable or washable coveralls. Take care not to touch and contaminate the outside surfaces of gloves and masks. Additional prevention strategies that should be adopted include proper hand and respiratory hygiene. The CDC reports that, in human studies, proper use of masks drastically reduces transmission risk of SARS-CoV-2. All personnel using PPE should be properly trained and certified in its use. People who are feeling unwell, who have known recent exposure to SARS-CoV-2, or those who meet other criteria for quarantine or isolation, should refrain from handling bats under any circumstances.

It is important to consider that any PPE used for bat research purposes will reduce the PPE available to public health workers. Given that a cornerstone of the advice from the World Health Organization (WHO) is reducing non-essential use of PPE, and due to a scarcity in medical PPE in several regions, it is recommended that all non-essential PPE be offered to public health services.

Bat research that guarantees a two-metre (minimum) separation between people and bats, such as acoustic monitoring or emergence counts, has a very low risk of exposing bats to SARS-CoV-2. This research should be able to continue if otherwise allowed under the jurisdiction's current public health recommendations.

Bat rehabilitation

With the welfare of our wildlife in mind, it is important to consider the situation from that of a wildlife population health perspective, rather than that of an individual animal. If wildlife can become infected with and transmit SARS-CoV-2, rehabilitated animals have the potential to spread the virus to other wild animals. This could add another threat to at-risk species, such as bats. The question of whether animals should be released is especially urgent for bats in spring, when many rehabilitation facilities would normally be planning to release hibernating bats that have been held over winter.

Agencies should conduct risk assessments on a case-by-case basis to decide whether wildlife rehabilitators should be allowed to take in new animals, what protective measures are required to handle wildlife in care, and if animals can be released back into the wild, considering the potential for introduction of SARS-CoV-2 to a wildlife reservoir. Permitting agencies should consider collaborating with a trusted advocate within the wildlife rehabilitation community to help strengthen working relationships with rehabilitation centres and assist in communication about the current risks surrounding rehabilitation of bats and the resulting management decisions.

Bats in the care of rehabilitation facilities should only be handled when absolutely necessary. The number of staff in contact with a bat in rehabilitation should be as low as possible, ensuring that all possible PPE measures (see 'Handling of wild bats for research purposes') are taken when handling bats. Anyone possibly infected with SARS-CoV-2, or who otherwise meet the jurisdiction's criteria for self-isolation, do not handle or care for bats or any wildlife. Note that measures to prevent rabies

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

transmission from bats to humans are not necessarily the same as measures to prevent droplet-based transmission of SARS-CoV-2 to bats. If possible, handling staff should test negative for COVID-19 prior to intake and release of bats. If staff tests positive for COVID-19 after being in proximity to bats in rehabilitation centres, potential exposure to the bat may have occurred and isolation of the bat, testing of the bat if possible, and delaying or abandoning release of the bat should be considered.

Bat interactions with the general public

Conservation officers or other staff may receive requests from the public to remove individual bats from human-occupied buildings. Public health guidelines within the jurisdiction should be the first consideration, and may restrict the ability of the conservation officer to respond. However, if public health recommendations can be followed and a live bat is found and captured in a living space where people have been present, wildlife management and permitting agencies should perform a risk assessment (based on, at least: species, bat health, time of year, and potential for exposure of the bat to SARS-CoV-2) to decide if the bat should be released or not. Consider that, if neither release nor rehabilitation are an option, the bat may have to be euthanized by a trained professional. If individual risk assessments and house-calls from agency staff are not possible, it is advised that wildlife management agencies provide the public with thorough advice on how to remove bats from a living space, considering the degree of risk for bats to become infected with SARS-CoV-2 in various situations. In situations where there has been no close contact with people or pets, bats can be removed from a building and released following these instructions, ensuring that PPE is worn during the capture and release of the bat.

After contacting your nearest CWHC regional centre, the collection of dead bats and the euthanasia of severely injured bats should proceed as usual. When there is a risk of rabies transmission, bats should be submitted for rabies testing immediately following the appropriate jurisdictional standard operating protocols.

Managing bat colonies in buildings

Some bat species regularly roost in or near anthropogenic structures. There are no recommendations for managing bat colonies from the perspective of bat health and SARS-CoV-2. There should be no risk for transmission of SARS-CoV-2 to bats living in a space separate from humans and pets (*e.g.*, an attic), so there is no need to exclude the bats to protect bat health. In general, bat exclusions should not take place from late spring to early fall unless there are special circumstances that have been appropriately assessed by government authorities. It is always recommended that experienced nuisance wildlife control officers or pest control operators with appropriate government issued permits (including Species at Risk permits, if required) conduct bat exclusions to ensure that best management practices are followed, including wearing the appropriate PPE. If a bat exclusion activity is deemed necessary, minimum PPE should include the use of nitrile gloves, Government of Canada or CDC recommended face masks (NIOSH approved N95 respirators without exhalation valves are best as they also protect the

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

wearer from histoplasmosis), and long-sleeved disposable or washable coveralls. Take care not to touch and contaminate the outside surfaces of gloves and masks. Additional prevention strategies that should be adopted include proper hand and respiratory hygiene.

This is a living document. Additional guidance on these or other topics may be added at a later date and current recommendations may be updated as more information becomes available.

Further reading

Anthony et al. 2013. Coronaviruses in bats from Mexico.

Association of fish and wildlife agencies voluntary interim guidance for bat-related activities in response to COVID-19.

BCT Response to IUCN COVID-19 Recommendations for Bat Field Workers.

Canadian Veterinary Medical Association. Coronavirus (COVID-19) Information Page.

Davy et al. 2018. White-nose syndrome is associated with increased replication of a naturally persisting coronaviruses in bats.

CDC - COVID-19 and Animals.

Dominguez et al. 2007. Detection of Group 1 Coronaviruses in Bats in North America.

Government of Canada. Coronavirus disease (COVID-19, Prevention and risks, Non-medical masks.

Gouilh et al. 2011. SARS-Coronavirus ancestor's foot-prints in South-East Asian bat colonies and the refuge theory.

Hall et al. 2020. Experimental challenge of a North American bat species, big brown bat (*Eptesicus fuscus*), with SARS-CoV-2.

Identification of 2019-nCoV related coronaviruses in Malayan pangolins in southern China.

IUCN SSC Bat Specialist Group: Recommended suspension of Field Activities for the Protection of Bats.

Lu et al. 2020. Genomic characterisation and epidemiology of 2019 novel coronavirus: implications for virus origins and receptor binding.

Misra et al. 2009. Detection of polyoma and corona viruses in bats of Canada.

Osborne et al. 2011. Alphacoronaviruses in New World Bats: Prevalence, Persistence, Phylogeny, and Potential for Interaction with Humans.

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

Runge et al. 2020. Assessing the risks posed by SARS-CoV-2 in and via North American bats—Decision framing and rapid risk assessment: U.S. Geological Survey Open-File Report 2020–1060, 43 p., https://doi.org/10.3133/ofr20201060.

Science-based facts & knowledge about wild animals, zoos, and SARS-CoV-2 Virus.

Shi et al. 2020. Susceptibility of ferrets, cats, dogs, and different domestic animals to SARS-coronavirus-2.

World Organisation of Animal Health (OIE) Guidelines for Working with Free-Ranging Wild Mammals in the Era of the COVID-19 Pandemic.

World Organisation for Animal Health (OIE) Questions and Answers on the 2019 Coronavirus Disease (COVID-19).

Acknowledgements

For the development of this document we thank our expert panel: Megan Jones, Tessa McBurney, Dave McRuer, Vikram Misra, Jordi Segers, and Craig Willis for taking the time to share their expertise and provide informed discussions that led to these recommendations. We thank Michael Anissimoff, Charles Francis, Cynthia Pekarik, Jennifer Provencher, and Ryan Zimmerling from Environment and Climate Change Canada (ECCC) for their input and review. We also thank ECCC for providing the French translation of this document. Additionally, versions of this document were reviewed by all CWHC regional directors and other CWHC staff and we thank all people who helped in this review.