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July 6, 2023

Request for Clarification Respecting the Assessment of American White Pelican

Dear Ms. Sayine-Crawford,

Thank you for your letter from June 13, 2023, requesting clarification on the assessment of American white pelican in the Northwest Territories (NWT). The Species at Risk Committee (SARC) reviewed your request and provides further clarification below.

Request:

"On page 29 the "index of area of occupancy" (IAO) for American White Pelican is said to be 8 km². The IAO is said to represent the Slave River breeding colony. Can another map of the IAO for American White Pelican in the NWT be shown at a larger scale to clearly show the 8 km²?

Further to the main factors, SARC's assessment included American White Pelican's susceptibility to a variety of diseases and parasites as an additional factor (page 3). The assessment states that these diseases and parasites have the potential of wiping out entire colonies because of their colonial breeding behaviour.

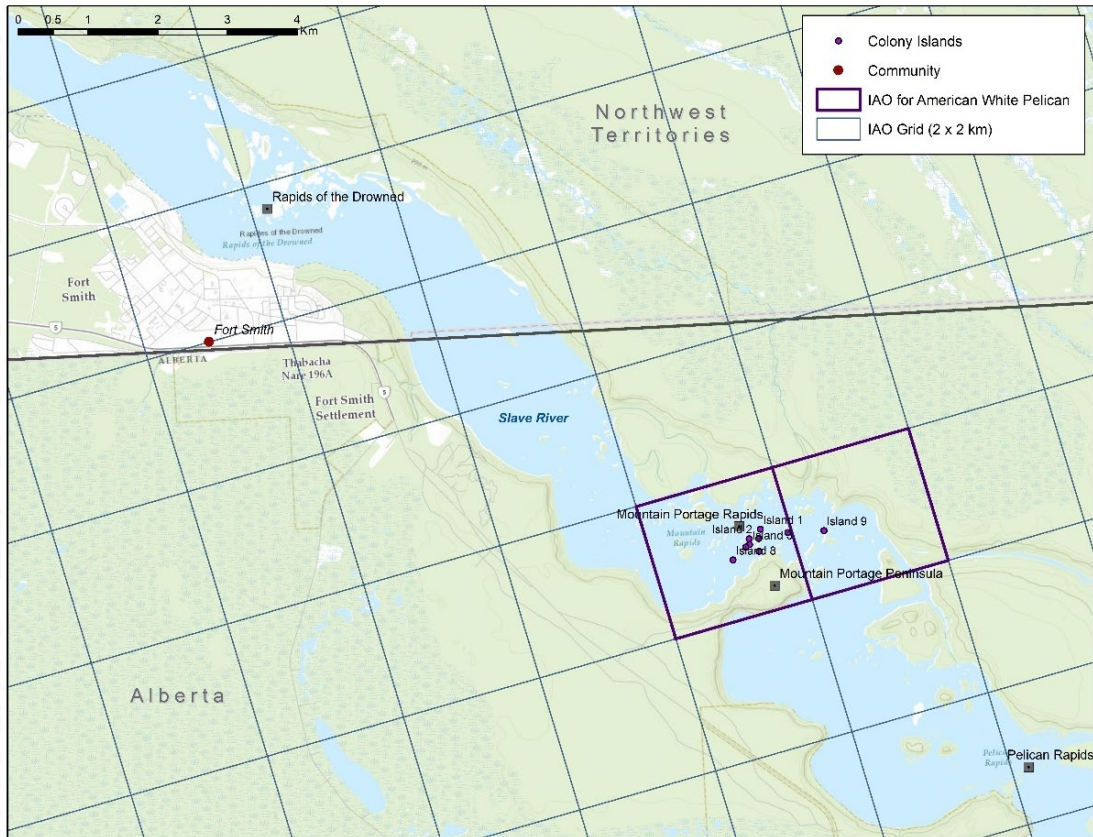
A detailed threat assessment for disease is included on page 81. Within this assessment the probability of the threat occurring within the next ten years was determined to be of medium likelihood. The timing was determined to be short term-future which is defined as expected in the near future (<10 years). The causal certainty, which is the

confidence that the threat will have an impact on the population, was determined to be high. Could SARC please expand on how they came to these determinations?"

Clarification from SARC:

Can another map of the IAO for American White Pelican in the NWT be shown at a larger scale to clearly show the 8 km²?

A figure illustrating the IAO for American White Pelican in the NWT is below including the nesting islands of the Slave River colony southeast of Fort Smith.



A detailed threat assessment for disease is included on page 81. Within this assessment the probability of the threat occurring within the next ten years was determined to be of medium likelihood. The timing was determined to be short term-future which is defined as expected in the near future (<10 years). The causal certainty, which is the confidence that the threat will have an impact on the population, was determined to be high. Could SARC please expand on how they came to these determinations?

Using best available information, SARC determines the overall level of concern of identified threats to a species, by considering timing of the threat, probability (likelihood) and causal certainty (confidence the threat will have an impact on the population), among other parameters.

In considering the threat of disease, SARC looked at whether the threat is presently happening, expected in the short term (<10 years), expected in the long term (>10 years), or not expected to happen at all. SARC also considered the likelihood (high, medium, or low) of the threat occurring over the next 10 years. For American white pelican, SARC determined there is a medium likelihood of disease occurring over the next 10 years.

Causal certainty refers to the level of confidence that the threat will have an impact on the population. If a disease were to enter the Slave River pelican colony, there is a high level of confidence that the impact on the population would be significant. American white pelicans are susceptible to a variety of diseases, and pelican colonies in the south have experienced substantial die-offs attributed to disease. The colonial nature of pelicans increases their vulnerability to diseases, as aggregations facilitate pathogen transmission. The Slave River colony is also a smaller colony, which further increases confidence that diseases would have population level effects. Although immigration is possible after a die-off, there are recorded instances within the NWT where American white pelicans have abandoned nesting locations (e.g., Oracha Falls) and have not returned to nest in over 40 years.

In terms of the timing and probability of the threat of disease to American white pelicans in the NWT, increases in the number and scale of pelican die-offs have been recorded elsewhere (Rocke *et al.* 2005). New diseases and the expansion of existing diseases to places they have not been recorded in the past are factors in these die-offs. In the United States between 1990 and 2003, new diseases or the novel appearance of diseases included chlamydiosis, West Nile virus encephalitis, possible Newcastle disease, and organochlorine toxicoses, as well as avian botulism (novel Type C) (Rocke *et al.* 2005).

Climate change has been and continues to be an important factor influencing the transmission, distribution, and incidence of diseases — and is expected to drive the movement of diseases northwards. Diseases that are known to impact American white pelican populations include avian botulism (Type C), West Nile virus, and H5N1 highly pathogenic avian influenza (HPAI or avian flu).

- **Avian botulism:** Avian botulism affects waterfowl, especially close congregations of waterfowl such as colonies. Avian botulism has been the cause of numerous American white pelican deaths in the United States since 1978. Between 1978 and 2003, there were 44 recorded die-offs and an estimated mortality of 11,500 individual American white pelicans in the United States (Rocke *et al.* 2005). An outbreak in southern California in 1996 caused approximately 8,500 American white pelican deaths representing 15-20% of the white pelican population.

A die-off linked to avian botulism of another species of colonial bird (black-legged kittiwake) was recorded in Alaska for the first time in 2021 (See www.adfg.alaska.gov/static/species/disease/pdfs/avian_botulism_type_c_detection_statement_9_sept_21.pdf).

Outbreaks of type C botulism are unpredictable but are associated with lower water levels and high summer surface temperatures ([Espelund and Klaveness 2014](#)). Although avian botulism has not yet been detected in the NWT, climate

change, causing higher summer temperatures, prolonged dry periods and lower water levels, may increase the likelihood of outbreaks.

- **West Nile virus:** West Nile virus (WNV) has been associated with American white pelican die-offs in the United States since 2002. It was first detected in the northern plains of the United States in 2002 and has since contributed significantly to chick mortality rates (Sovada *et al.* 2008). Between 2004 and 2007, White Pelicans on the Bitter, Chase, and Medicine Lake colonies in the northern plains were monitored to assess the impact of West Nile Virus (Sovada *et al.* 2008, 2013). Mortality rates were as high as 25% at Bitter Lake, 40% at Chase Lake, and 44% at Medicine Lake in the years since West Nile Virus arrived in the region (Sovada *et al.* 2008, 2013).

Climate change and associated warmer temperatures can accelerate mosquito development, biting rates and the incubation of disease within a mosquito ([EPA 2023](#)). In addition, mild winters and drought conditions (which are also expected to become more frequent with climate change) are associated with WNV disease outbreaks and rainfall creates breeding sites for mosquitoes ([EPA 2023](#)).

- **H5N1 highly pathogenic avian influenza (HPAI or avian flu):** There have been a total of 2,237 positive samples (suspect and confirmed) of birds with HPAI from across Canada in 2022 and 2023 (CWHC *et al.* 2023), including 24 suspected or positive American white pelicans in British Columbia, Alberta, Saskatchewan, Manitoba and Ontario (CWHC *et al.* 2023). In 2022, HPAI was confirmed in the NWT for the first time. There was one confirmed HPAI positive herring gull collected in Yellowknife in June 2022, and two confirmed HPAI positive ravens in the Dehcho Region in October 2022 (GNWT 2022).

In summary, avian botulism has been the major cause of mortality for southern colonies of American white pelicans, affecting up to 20% of populations indicating that disease has a high severity. In addition, West Nile virus has caused the second most mortalities of

American white pelicans and, at one site, West Nile virus wiped out up to 95% of American white pelican young (Rocke *et al.* 2005). HPAI represents the novel appearance of previously recognized diseases that is now being observed in the NWT where it has not been recorded in the past – indicating that disease is expected to impact American white pelicans in the short-term future.

I hope this addresses your questions about these aspects of SARC's assessment. Additional resources and references cited are below.

References Cited:

CWHC, Environment and Climate Change Canada, and the Canadian Food Inspection Agency. 2023. Highly Pathogenic Avian Influenza – Dashboard. Accessed April 20, 2023 and June 29, 2023. Website: <https://cfia-ncr.maps.arcgis.com/apps/dashboards/89c779e98cdf492c899df23e1c38fdbc>

Espelund, E. and D. Klaveness. 2014. Botulism outbreaks in natural environments—an update. *Frontiers in Microbiology*. 5: 287. doi: [10.3389/fmicb.2014.00287](https://doi.org/10.3389/fmicb.2014.00287)

Government of the Northwest Territories (GNWT). 2022. Public Service Announcement: Two cases of Avian Influenza confirmed in the NWT. Website: <https://www.gov.nt.ca/en/newsroom/two-cases-avian-influenza-confirmed-nwt> [accessed April 20, 2023].

Rocke, T., K. Converse, C. Meteyer and R. McLean. 2005. The impact of disease in American White Pelicans in North America. *Waterbirds* 28: 87–94. Available online: <https://www.jstor.org/stable/4132656>

Sovada, M.A., P.J. Pietz, K.A. Converse, D.T. King, E.K. Hofmeister, P. Scherr and H.S. Ip. 2008. Impact of West Nile virus and other mortality factors on American white Pelicans at breeding colonies in the northern plains of North America. *Biological Conservation* 141:1021–1031. Available online: <https://doi.org/10.1016/j.biocon.2008.01.019>

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www.adfg.alaska.gov/static/species/disease/pdfs/avian_botulism_type_c_detection_statement_9_sept_21.pdf.

United States Environmental Protection Agency (EPA). 2023. Climate Change Indicators: West Nile Virus. Website: <https://www.epa.gov/climate-indicators/climate-change-indicators-west-nile-virus#:~:text=Climate%20change%20increases%20the%20risk,the%20disease%20within%20a%20mosquito>.

Other helpful websites include:

- [West Nile Virus Fact Sheet](#) (Canadian Food Inspection Agency)
- [Highly Pathogenic Avian Influenza – Wild Birds Dashboard](#) (ECCC/CWHC/CFIA) – Up to date information on suspected and confirmed cases of HPAI
- [Status of ongoing avian influenza response by province](#) (CFIA)
- [Avian Influenza: What You Need to Know](#) (GNWT)

Sincerely,



Suzanna Carriere, Alternate Chairperson
Species at Risk Committee

- c. Northwest Territories Species at Risk Committee
Northwest Territories Conference of Management Authorities