

NWT Biodiversity Arthropod Monitoring - Insect, Spider, and Habitat (Plant) Collections- Supplemental Information

Under the previous permit from 2020-2025, this project gathered important data on the presence, distribution, and population trends of many arthropod species in the NWT. This included the NWT roadside bumble bee surveys, the mosquito collection project, and opportunistic “Bioblitz” events. This data can be used to inform the General Status Ranking Program, species assessments, and status reports on many bumble bee species and other arthropods.

Under this permit, we hope to continue to conduct roadside bumble bee surveys, mosquito collections, and other opportunistic arthropod collections (depending on funding). These collections may include habitat features complementary to insect and spider collection (e.g., a plant an insect is found on) or occasional small-scale specimen collection for species identification.

Roadside Bumble Bee Survey Program

Roadside bumble bee surveys were conducted in 18 different locations between the summers of 2023-2025. In total, approximately 2000 bumble bee specimens were collected over the 3 years of roadside surveys. The 2023 surveys were completed near Norman Wells, Inuvik, and Yellowknife and in total, captured 13 different bumble bee species. 2024 and 2025 bumble bee specimens are still being processed, but so far, 16 bumble bee species have been identified from the 2024 specimens.

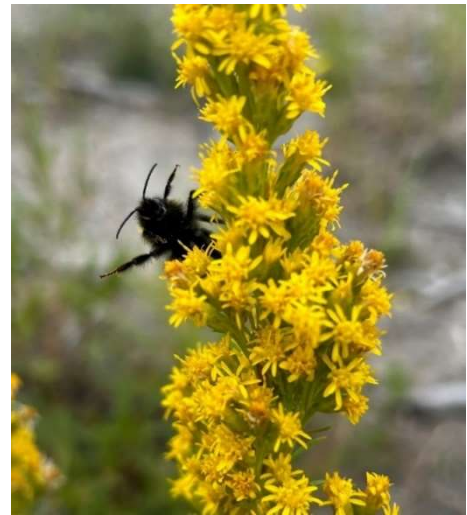




Figure 1. Locations of bumble bee surveys completed under this permit previously.

Mosquito Surveillance Program

Since 2004, the Government of the Northwest Territories (GNWT) Department of Environment and Climate Change has conducted adult mosquito surveillance to monitor mosquito species diversity and track temporal changes in vector populations across the Northwest Territories. A key objective of this program is the early detection and monitoring of mosquito species capable of transmitting vector-borne pathogens of concern, including West Nile Virus (WNV) and California serogroup viruses (CSGv).

The program uses Centre for Disease Control (CDC) ultraviolet light traps baited with carbon dioxide at targeted monitoring locations



across the NWT, currently including Fort Smith (2 sites), Fort Simpson (2 sites), Yellowknife (1 site), and Norman Wells (1 site). Surveillance is conducted during the active mosquito season, typically from May/June through September, using 24-hour trap deployments twice weekly. Monitoring in Fort Smith and Fort Simpson has remained consistent throughout the study period, while Yellowknife and Norman Wells sites were re-established in 2025 to support more consistent long-term surveillance coverage.

Over the course of the program, GNWT has partnered with multiple collaborators to support mosquito species identification and pathogen screening, including the National Microbiology Laboratory (NML), Taz Stuart (TDTS Consulting), Royal Alberta Museum (Dr. Loki Snyman), Acadia University (Dr. Carol-Anne Villeneuve), and University of Alberta (Dr. Jumari Snyman). Mosquitoes are identified morphologically to characterize species composition, and pooled samples are tested by PCR for the presence of WNV and CSGv.

To date, WNV has not been detected in mosquito samples collected in the Northwest Territories. CSGv have been detected in pooled mosquito samples, with the first detections recorded in 2020 following the initiation of CSGv testing in 2018. Surveillance has also confirmed the presence of mosquito species in the NWT that are considered competent vectors for both WNV and CSGv. Additional detail is available in the [GNWT Manuscript Report No. 286 – An Overview of the West Nile Virus and California Serogroup of Viruses Vector Competent Mosquito Species in the Northwest Territories from 2004-2018](#).

Continued long-term mosquito surveillance provides critical insight into changes in mosquito biodiversity and vector distribution in a rapidly changing northern environment. This program serves as an early warning system for emerging pathogens that may pose risks to wildlife, domestic animals, and people, while also providing a climate-sensitive indicator of broader ecosystem and environmental health changes.