



CANADIAN  
**WILDLIFE HEALTH  
COOPERATIVE**

# ANNUAL REPORT

## 2022-2023



## OUR MISSION

To promote and protect the health of wildlife and Canadians through leadership, partnership, investigation, and action.

## OUR VISION

A world that is safe and sustainable for wildlife and society.

## MESSAGE from the CEO

I am very happy to present the 2022/2023 Annual report of the Canadian Wildlife Health Cooperative (CWHC). This is my first annual report as the new Chief Executive Officer, and I am so excited, honoured, and privileged to serve in this role. I have long admired the CWHC and its unique position at the heart of Canada's wildlife health surveillance system and the fantastic partnerships with academia, the provinces and territories, and the Federal Government that it was built upon, and I can only hope I can live up to the standards of my predecessors.

In this light, I think it is particularly important to acknowledge the efforts and impact of Patrick Zimmer, CWHC Chief Operating Officer and National Office Director. Patrick stepped into the role of interim Chief Executive Officer in 2020, and skillfully led the CWHC during a difficult time of transition and external challenges such as COVID-19 and the emergence of highly pathogenic avian influenza (H5N1) in Canada. We owe a great deal of thanks to Patrick for successfully steering the CWHC through these challenges, all the while preserving and setting up the organization for future successes. Thank you so much for your efforts and commitment Patrick!

The explosive spread of highly pathogenic avian influenza (H5N1) to wildlife and domestic animal populations across North America was a dramatic challenge for everyone involved in animal health across Canada this past year, and the CWHC was no exception. All the facilities in the Cooperative were overwhelmed with calls and submissions; for example, the number of birds and mammals submitted to CWHC was triple the average of previous years. Increased submissions resulted in increased numbers of necropsies, diagnostic testing, reporting ... all of which had dramatic impacts on workplans and budgets.

Through heroic efforts and excellent collaborations with all our partners in the Canadian collaborative response to the outbreak, the CWHC not only weathered the storm but also continued to demonstrate its critical value in preserving wildlife health and biodiversity across Canada.

None of this would have been possible without the support of our partners and funders. We express our heartfelt appreciation to each and every organization and individual who has contributed to the CWHC's mission. This collaboration, financial support, and shared vision continue to be instrumental in the "Pan-Canadian Approach to Wildlife Health" that the CWHC subscribes to along with all our partners. We are truly grateful, and look forward to further strengthening our partnerships in the years to come.

### DAMIEN JOLY

CWHC Chief Executive Officer

# PCAWH - A NEW FOCUS

## OVERVIEW

Building on work started by our previous CEO, Dr. Craig Stephen, and our current COO, Patrick Zimmer, the CWHC has been working with our partners and the Dean's office in the Western College of Veterinary Medicine, on internal restructuring to allow for greater organizational transparency and cooperation within the network. This work includes an overhaul of our governance model in order to allow us to refocus on our commitment to implementing the Pan-Canadian Approach to Wildlife Health (PCAWH). This work was identified by both internal stakeholders as well as Federal partners as necessary to help improve the long-term sustainability and scalability of the network.

## NEW CEO

An important step in this restructuring has been to find the right person to occupy the CEO position and help to guide the CWHC into its role as the prime delivery mechanism for the PCAWH.

Damien O. Joly, Ph.D., was appointed as the CEO of the Canadian Wildlife Health Cooperative (CWHC) in October of 2022. Damien has held various leadership positions throughout his career, including in provincial government (BC), the private sector (Metabiota Inc.), and a non-profit (Wildlife Conservation Society). He has played key roles developing wildlife disease surveillance

systems and capacity-building programs. He holds a Ph.D. in Biology from the University of Saskatchewan and a B.Sc. in Wildlife Biology from the University of Northern British Columbia.

Damien has already begun the work of helping the network meaningfully reconnect after a period of pandemic restrictions. His first task when joining the CWHC was to visit all 6 regional centres and meet with as many people in the organisation as possible to gain insight on the challenges and opportunities we face as a cooperative. Eight themes of focus emerged from these discussions as priorities, including: partner (re-)engagement, establishing consistent and predictable funding streams, rebuilding CWHC culture after years of pandemic disruption, planning for CWHC growth by building our financial infrastructure and strengthening our network, confirming the CWHC's national leadership in wildlife health, enacting the new governance model, improving our data management system, and perhaps most importantly, establishing a path for the CWHC to work towards Reconciliation with Indigenous Peoples.

His initial foci have been to strengthen the ties between the various regional centres of the CWHC and to align our priorities and strategic vision with that of our many and varied FPT partners.

## NEW GOVERNANCE

When it was established in 1992, the CWHC was set up as a centre on the University of Saskatchewan campus. This designation on campus has changed several times over the past thirty years and it has been important to redefine and reaffirm our role within the campus community at the same time as we look to strengthen our relationships with our funding partners and various other stakeholders.

A comprehensive governance review was performed by the CWHC leadership group, in consultation with the Dean of the Western College of Veterinary Medicine and included external reviews by different consultant groups. The way the network was managed was reviewed by this group, which made several key observations about how lines of communication and authority could be formalized and codified in order to position the CWHC as a more robust vehicle for the implementation of the PCAWH. The restructuring of this governance model includes the formation of a Board of Directors, a Regional Advisory Committee that comprises the regional directors within the network, and a Partner Engagement Council, which will include members of our main funding partners. Reporting ultimately to the Dean of the WCVL, the CEO is responsible for harmonizing the work of these various groups and leading the CWHC into the next phase of its existence.



## LOOKING BACK

### AVIAN INFLUENZA RESPONSE - A NATIONAL RESPONSE

The past twelve months have seen a large part of the CWHC's effort expended on our involvement with the Federal/Provincial/Territorial (FPT) response to the ongoing Highly Pathogenic Avian Influenza outbreak. Throughout this report you will read about the work we have been doing in many different areas to provide surveillance effort, data management, and program coordination capacity to our FPT partners.

Some of the highlights that you will read about are:

- The establishment of an Avian Influenza Program Coordinator position, housed at the CWHC National Office and funded by Environment and Climate Change Canada
- Online reporting tools and capacity to provide as much coverage as possible to both urban and rural areas
- Data management collaboration to coordinate and harmonize the multiple sources of mortality and testing data across the country
- Reporting and communication with FPT partners, members of the public, and media outlets

This work is ongoing and the CWHC continues to play a vital role in the coordination of a large number of FPT partners, researchers, and other wildlife health professionals.



## CASE STUDY

### CASES OF WEST NILE VIRUS INFECTIONS IN COMMON LOONS

During the months of July and August, five adult common loons (*Gavia immer*) were found dead in the same area in the Outaouais region, Quebec. Three of these birds were submitted for analysis to the CWHC Quebec regional center (CQSAS).

The pathological examination performed in these birds revealed the presence of lesions in the spleen and intestines: a fibrinonecrotic splenitis (inflammation of the spleen) and an enteritis (inflammation of the intestine) characterized by multifocal necrosis of the intestinal crypts (Figure 1). It should be noted that all three birds were in very good body condition, indicating death from an acute process. The lesions observed were suggestive of a bacterial or viral infection. Two viruses, of exotic origin, which are present in Quebec in wild birds, can potentially cause these types of lesions: highly pathogenic avian influenza (H5N1) and West Nile virus (WNV). The H5N1 virus first appeared in North America last winter. This virus, which has so far caused a large number of mortalities in different species of wild and domestic birds, is known to induce lesions in different organs, including the intestines and the spleen. The WNV, which was introduced to Canada in the early 2000s, can also cause enteritis and splenitis in some species of birds.

Although cases of WNV have already been reported in common loons in Minnesota (see Wünschmann, A. 2021. *Pathology in Practice*. 1410–1412), to our knowledge, the cases presented here are the first cases reported in this species in Canada.



# MONITORING

## OVERVIEW

We monitor for changes in wildlife health by providing a cross-Canada infrastructure and expertise to support the diagnostics needs of a national surveillance program. By supplementing capacity to actively track threats and investigate their meaning we link and integrate the observations to develop a national view of the wildlife health situation.

In some cases, our monitoring activities provide assurances to Canadians and trading partners that our environments, animals and products are safe. In other cases, it provides early warning signals that new threats are emerging or known threats are coming under control. Wildlife health monitoring provides a set of observations and signals that have relevance for conservation, public health, agriculture, recreation, cultural enjoyment of nature and economic development. It provides a very extensive view of the interface of people, animals and our shared environments.

## ACTIVE FUNCTIONS

- Disease & hazard detection
- Field investigation
- Harmonization

## ANTICOAGULANT RODENTICIDE TOXICITY IN WILDLIFE PREDATORS

With all the news about avian influenza over the past few months, it is sometimes easy to forget that our local wildlife are dealing with other challenges on a daily basis. Unfortunately, one of these challenges comes in the form of a poison that we are utilizing to control other wildlife. In our previous blog reports, we discussed the use of anticoagulant rodenticides and how they are being detected in multiple raptor species (<http://blog.healthywildlife.ca/raptors-and-rodenticides>). In addition to detecting these rodenticides in birds, we also occasionally examine predators who have died as a direct result of being exposed to these rodenticides.

So far in 2022, we have found evidence that supports anticoagulant rodenticide toxicity as the cause of death in 11 raptors and 1 mammalian carnivore. The species affected include 7 great horned owls, 2 red-tailed hawks, 1 turkey vulture, 1 bald eagle, and 1 red fox. Determining that an animal has died as a direct result of anticoagulant rodenticide toxicity can be challenging, but typically is achieved by finding evidence of either external or internal hemorrhage of unexplained cause, as well as detecting anticoagulant rodenticides in the liver at a level that is consistent with toxicity. We work with colleagues at the Animal Health laboratory at the University of Guelph who conduct the rodenticide testing for our cases.

As we continue to see more of these exposures and deaths secondary to anticoagulant rodenticide toxicity, there is more discussion as to whether the use of these poisons is completely necessary, when more targeted pest-control options are available. British Columbia has recently changed a temporary ban on the use of anticoagulant rodenticides to a now permanent ban on their use with few exceptions. It's possible that this ban will eventually lead to similar changes in other provinces, which would be good news for many of our predators that rely on rodents as their primary source of food.

## BAT HANDLING AND WELFARE

Recognizing the critical need for current bat handling care and welfare guidelines, Parks Canada Agency and the Canadian Wildlife Health Cooperative partnered to apply for funding to achieve the following three step process: 1) perform a literature review to identify the current global best practices for the safe care and handling of bats; 2) convene a working group of Canadian leaders in the bat research and management community to evaluate current practices and develop consensus on improved guidelines;

and 3) collaboratively write updated guidelines for better care and handling of bats.

Dr. Krista Patriquin (Saint Mary's University) and Lori Phinney (Mersey Tobeatic Research Institute) led a representative group with academic, wildlife management, animal welfare, not-for-profit, veterinary and indigenous backgrounds to use their diverse expertise in bat biology, ecology and health to produce a consensus-based document, Recommendations for Bat Censuses Involving Capture and Handling.

It takes leadership and cooperation from dedicated individuals to act responsibly on behalf of wildlife species to ensure their best interests are met while advancing evidence-based science. Therefore, we believe, once approved and published that this document will be a welcome and well received conservation contribution to the bat research and management community within Canada and beyond.



## MONITORING (cont)

### HOST-PARASITE RELATIONSHIPS IN MARINE MAMMALS: A FRAGILE AND SOMETIMES FATAL BALANCE

Marine mammals, like most wild animals, are frequently infected with parasites. When investigating mortality in a marine mammal, the pathologist must carefully evaluate the potential impact of a parasitic infection on the animal's health. In the vast majority of cases, these parasitic infections are not associated with mortality. While these parasites represent a physiological cost to the host, the host usually manages to accommodate the presence of these organisms. In most cases, there is a host-parasite balance, as the survival and transmission of the parasite usually depend on the host's survival. However, under certain circumstances, these parasitic infections can be fatal. Our Québec region investigate three particularly interesting cases this year, one a white-beaked dolphin, which



was the first time that species has been necropsied in the province, a harbour seal found dead in June 2022 in Sept-Îles, and the third, a harbour porpoise which was found in good body condition in September.

The death of the white-beaked dolphin was caused by a pneumothorax secondary to the rupture of a pulmonary nematode cyst of the genus *Halocercus sp.* The influx of air into the thorax caused compression of the lungs, preventing them from inflating and thus preventing the animal from breathing. A second species of nematode, *Otostrongylus circumlitus*, caused the death of the harbour seal. This female juvenile was severely emaciated, suggesting death from a chronic disease. During the examination of the lungs, an important quantity of large, white, filiform roundworms (2 mm x 15 cm long) obstructing the airways was observed in both bronchi. The good body condition of the harbour porpoise was suggestive of a death due to a sudden event. The most significant observation made on this animal was the presence of a large amount of coagulated blood in the first gastric compartment. This significant gastric bleeding was associated with the presence of numerous nematodes (roundworms) with characteristic morphology of Anisakidae. This type of case has rarely been documented in the harbour seal population of the St. Lawrence. However, very few specimens from the at-risk group (weaned juveniles) have been examined by our laboratory so far. Therefore, it is currently impossible to determine the importance of this parasitosis in the dynamics of this population.

The findings in these three animals highlight the importance of performing passive scanning surveillance across species and locations. These opportunistic submissions frequently provide insights into causes of mortality that might not normally be observed and can help to inform targeted surveillance efforts and population management actions.

To read more about these three cases, please visit our blog here: <http://healthywildlife.ca/host-parasite-relationships-in-marine-mammals-a-fragile-and-sometimes-fatal-balance/>

## MONITORING (cont)

### OUTBREAK OF TULAREMIA IN MUSKRATS AND BEAVERS FROM QUEBEC

One beaver and two muskrats were submitted to the CWHN's Quebec Regional Centre for analysis. The animals had been found dead in May 2022 near Sainte-Anne-de-Sorel, Quebec. Several beaver and muskrat carcasses had been observed in the area in previous weeks.

The beaver spleen was enlarged and mottled with white spots. Histological examination of the organs revealed acute multifocal necrotizing hepatitis and splenitis. These are sometimes associated with the presence of small Gram-negative bacteria (Figure 2).

The presence of *Fransicella tularensis* was confirmed by molecular analysis (PCR) performed on the livers of all three individuals. The bacterial strain associated with these deaths was identified as type B (*ssp. holarctica*) by the Laboratoire National de Microbiologie.

To our knowledge, these are the first cases of tularemia diagnosed in wildlife in this region of the province. In Quebec, tularemia is usually observed in snowshoe hares. The presence of this disease in beavers and muskrats is therefore unusual. It should be noted that *F. tularensis holarctica* (type B) is more commonly observed in aquatic rodents. This strain is less virulent in humans than *F. tularensis tularensis* (also known as *F. t. neartica* or type A), which is mainly found in snowshoe hares.

Tularemia, a potentially fatal zoonosis, can be transmitted to humans following contact with an infected animal, or via contaminated equipment or environment. A person can contract the disease after being bitten or licked by an infected animal, by handling an infected animal dead or alive, by inhaling air or dust contaminated by the bacteria (risk of contagion when opening an infected carcass) or by ingesting contaminated water or food. Tularemia can also be transmitted by tick bites. However, the disease is not transmitted from human to human. Symptoms of tularemia in humans include fever, headache, muscle pain, dry cough and pneumonia. Antibiotic treatment usually controls the infection.

<http://healthywildlife.ca/outbreak-of-tularemia-in-muskrats-and-beavers-from-quebec>

### ECHINOCOCCUS MULTILOCULARIS DETECTED FOR THE SECOND TIME IN AN EASTERN CHIPMUNK IN ONTARIO

In October of 2022, an eastern chipmunk from Port Perry was brought to a local wildlife rehabilitation centre. The small animal appeared to be in pain and had an enlarged and abnormal mass in its abdomen. The wildlife rehabilitator opted to humanely euthanize the chipmunk and send the carcass to CWHC, strongly suspecting an *Echinococcus multilocularis* infection.

Upon gross examination by our pathologist, changes consistent with an *E. multilocularis* infection were identified immediately. Filling much of the abdomen and displacing the organs was a large mass composed of innumerable 2-3 mm diameter cysts. On cut section, the cysts contained serous fluid and 1-2 mm long white structures (presumably larval tapeworms). A sample of the cysts were sent for additional testing and found to be positive for *Echinococcus multilocularis*. Infection with *E. multilocularis* can lead to severe internal disease with extensive cyst formation (alveolar hydatid cysts), which often displace the normal viscera and can eventually lead to the death of the affected rodent. Unfortunately for this chipmunk, this is thought to be the cause of death as there were no other signs of abnormalities upon examination.

*Echinococcus multilocularis* is a small tapeworm found in the intestinal tract of infected canines and domestic dogs. The lifecycle of this tapeworm includes a mature stage in the definitive carnivore host, and an immature stage in an intermediate host – usually a prey species such as a small rodent. In this intermediate stage, the tapeworms develop in slowly growing cystic structures resembling a tumor. The lifecycle is usually completed once the carnivore eats the infected rodent.

### ADRENAL TUMOUR (PHEOCHROMOCYTOMA) IN A HARBOUR PORPOISE

An adult male harbour porpoise found stranded last summer in Cloridorme, Gaspésie, Quebec was submitted for necropsy at the Quebec Regional Center of the Canadian Wildlife Health Cooperative (CQSAS). Macroscopic examination of the animal revealed that the carcass was thin and presented various parasitic infections affecting the lungs, liver and stomach. This type of parasitism is common in adult porpoises and is often well tolerated by the animal. This individual's left adrenal gland was increased in size (see photo 1). In fact, the weight of the left adrenal gland was 4 times greater than that of the right adrenal gland. Upon sectioning the gland, we observed that the medulla (central portion) of the gland occupied most of the organ; on the other hand, the cortex (external portion) of this gland was essentially absent.

Microscopic examination of the affected gland confirmed that this animal was affected by a pheochromocytoma, a tumour of the medulla of the adrenal gland. This tumour is often functional and

## MONITORING [cont]

### ADRENAL TUMOUR (PHEOCHROMOCYTOMA) IN A HARBOUR PORPOISE [cont]

secretes catecholamines (epinephrine, norepinephrine). These hormones that are normally produced during stressful events, can be overproduced by the tumour and can have negative systemic effects, such as hypertension, weakness, arrhythmia and even collapse of the individual.

In the case of this porpoise, the microscopic examination of different tissues revealed a thickening of the wall of certain arterioles, which suggests a state of hypertension. It is therefore hypothesized that this glandular tumour was potentially responsible for the stranding of this porpoise.

Pheochromocytomas are rare tumours among wildlife. They have already been described in a white-beaked dolphin as well as in a spotted dolphin. Tumours and proliferative lesions have also been diagnosed in the adrenal medulla of 11 belugas from the St. Lawrence River. However, to our knowledge, this tumour has not yet been reported in harbour porpoises.

As of today, the risk factors for this tumour are not known. Continued efforts to document the causes of mortality in harbour porpoises as well as the incidence of adrenal tumours in cetaceans in general could eventually give us more information on the cause of pheochromocytomas.

### WINTER MORTALITY OF AMERICAN CROWS: ORTHOREOVIRUS IN ONTARIO

In late November of 2022, CWHC began receiving calls from the Chatham-Kent region regarding an alarming number of dead crows, with no apparent cause of death. We received six crows from this area over the next few weeks for examination, but the reports continued well into the new year. These specimens came from the south-western region of Chatham along the north bank of the Thames River with reports specifically from the Village on the Thames, the walking trail near Enbridge, and apartment buildings on Grand Avenue West. In addition to this crow die-off, we also began receiving a handful of calls from the Woodstock area. They too were seeing similar patterns, with several intact birds found dead but in the north end of Woodstock, near Roth Park. With over 300 birds reported dead in Chatham, and over 30 in Woodstock, what could be causing these crows to die in such large numbers?

Nine crows from these two locations were submitted to CWHC ON/NU for examination. All of the crows were tested for avian influenza; eight were negative, and one tested positive for the highly pathogenic (H5N1) strain of avian influenza. All were examined, and the eight that tested negative for avian influenza were all found to have intestines lined by and filled with blood and necrotic

material. Three of these crows also had an enlarged and friable spleen. Two of the crows were examined microscopically and both had evidence of necrosis scattered throughout the spleen, and abundant necrosis lining the mucosa and filling the lumen of the intestinal sections examined. Spleen and intestine from one crow were sent for virus isolation and an orthoreovirus was isolated from this tissue.

When most people think of diseases that affect crows, West Nile virus likely jumps to the front of their mind, but unfortunately for our crows, there's another virus that hits them hard in the winter. Since 2001, there have been reports of large numbers of crows dying during the cold winter months. This coincides with the time of year when crows live in the highest density, which, in combination with environmental survival of the virus during cold weather, provides an ideal situation for transmission of this orthoreovirus infection. Although there have been other reoviruses detected in other bird species (including a strain which causes arthritis in poultry), this specific reovirus only appears to negatively affect crows. There is currently no known danger for humans or other animals from this virus.

Unfortunately, this isn't the only virus that has been affecting our crow populations recently. In addition to orthoreovirus and West Nile virus, the highly pathogenic strain (H5N1) of avian influenza, which has been circulating in wildlife since December 2021, has also been found to cause the death of crows across the province. Thankfully, there are millions of crows in Ontario, and we have not yet noticed any population level impacts associated with the presence of these three viruses – but it is something that we will have to continue to monitor.



# MONITORING [cont]

## GENERAL SURVEILLANCE

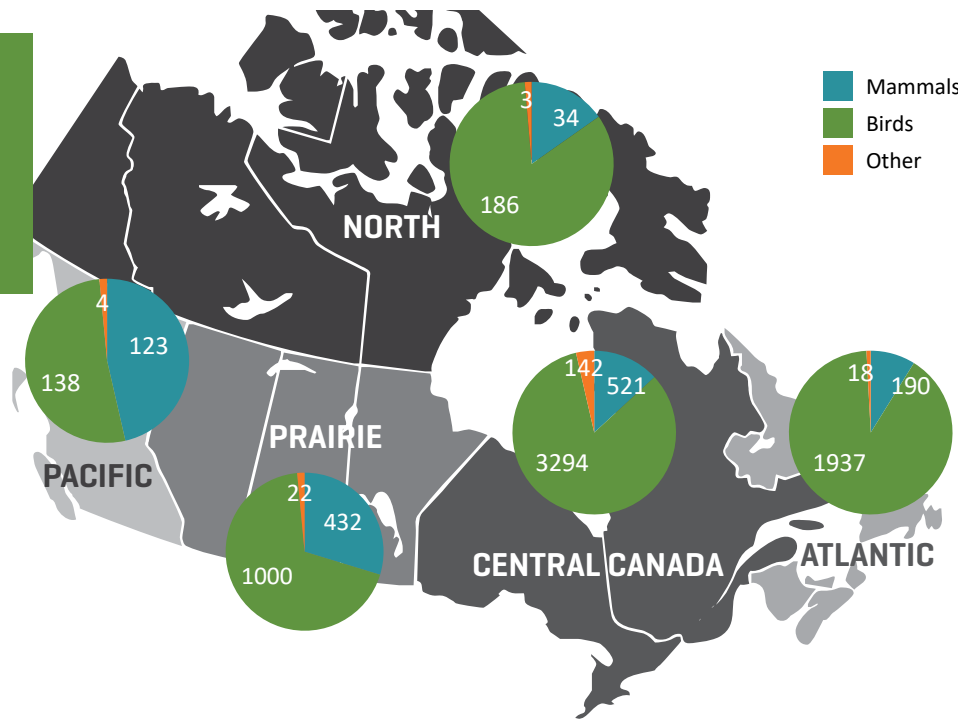
**Scanning surveillance activities are a foundation of CWHC programs.** By investigating causes of death and disease, the CWHC tracks changes in endemic diseases, discovers emerging diseases and interprets and communicates these findings to stakeholders that cross ministries, governments and sectors. The CWHC receives and assesses approximately 5000 wildlife submissions per year across all regions in Canada. These cases are subject to state-of-the-art diagnostics and expertise to provide situational awareness for conservation, public health, and agriculture.

CWHC surveillance activities culminate in converting our information and assessment into useable advice and technical information and facilitating processes to turn our outputs into action. This includes spearheading national strategies, integrating information with our partners to develop national perspectives on wildlife health issues and facilitating and coordinating management and assessment plans.

## ANIMALS SUBMITTED by region

### REGION TOTALS

|                |      |
|----------------|------|
| Pacific        | 265  |
| Prairie        | 1454 |
| Central Canada | 3957 |
| Atlantic       | 2145 |
| North          | 223  |



**8044 ANIMALS TOTAL**  
\* Numbers correct as of July 18, 2022



## HEALTH INTELLIGENCE

The CWHC is always looking for ways to expand the ways we monitor wildlife health and disease to gain a better understanding of the environment in which our wildlife populations succeed or fail. Health outcome monitoring allows us to observe changes in disease patterns via core diagnostic surveillance efforts, targeted collection of samples for specific diseases or species groups, and reviews of research regarding health indicators and sentinel species. 2021 saw the release of the Wildlife Health Tracker mobile app, which along with our online reporting tool allows members of the public to report unusual wildlife health observations to the CWHC. These reporting tools have been significant in enhancing the collection of information during the HPAI outbreak at the start of 2022.

## SELECTED DISEASES

| Project                 | Examined | Positive |
|-------------------------|----------|----------|
| Avian Botulism          | 1779     | 0        |
| Avian Cholera           | 1779     | 4        |
| Avian Influenza         | 4929     | 2132     |
| Bovine tuberculosis     | 255      | 0        |
| Canine distemper        | 1019     | 48       |
| Chronic wasting disease | 246      | 39       |
| Newcastle Disease       | 2713     | 1        |
| Rabies                  | 2154     | 21       |
| Snake fungal disease    | 26       | 8        |
| West Nile Virus         | 6440     | 136      |
| White nose syndrome     | 230      | 4        |



# ASSESSMENT

## OVERVIEW

CWHC members contribute to numerous working groups and committees: representing Canada at international meetings, serving as national sources of expertise, and supporting local management programs. The CWHC National Office leads the organization's health information management efforts through the development and maintenance of a world-class database system for wildlife health surveillance; the Wildlife Health Intelligence Platform (WHIP). This system provides real-time data to the CWHC network and allows regional centres and the national office to perform queries on historical and current wildlife health data to look for trends and signals that could identify emerging issues. WHIP is also used by several organizations around the world, including the Dutch Wildlife Health Centre (DWHC), the Northeast Wildlife Disease Cooperative (NWDC), in the United States, and the Wildlife Conservation Society (WCS).

## WILDLIFE HEALTH INTELLIGENCE PLATFORM

The Wildlife Health Intelligence Platform continues to be a cornerstone tool which enables the CWHC to provide timely information to multiple stakeholders across the country. This unique, centralized wildlife disease repository is accessible by all members of the CWHC and provides real time information to staff in order to diagnose disease and provide both quantitative and qualitative reporting in addition to risk assessment context to decision makers at multiple levels of government as well as a wide array of researchers.

The CWHC has a dedicated team of developers who maintain and continue to improve our Wildlife Health Intelligence Platform, the cornerstone of which is a centralized web-based database of wildlife mortality and morbidity across the country. The WHIP acts as the day-to-day tool used by our biologists, technicians, and pathologists to investigate and record causes of mortality and other significant findings during our ongoing passive surveillance efforts. In addition, data from targeted surveillance projects, such as Rabies, Bat White-Nose Syndrome, and Avian Influenza are also recorded, with results being communicated through several different channels.

The WHIP is also the foundation on which our online reporting tools are built and continue to be refined. The ability to flow observational information through the CWHC in addition to sample submission and collection efforts has proved crucial in monitoring the current outbreak of HPAI in Canada. The further refinement of these tools is a primary focus for the CWHC National Office in the coming fiscal year.

## REGULATORY REPORTING

The CWHC uses the WHIP to aggregate data into summary reporting on select diseases such as West Nile virus, Bat white-nose syndrome, and Avian Influenza. We also perform official disease status reporting for CFIA and OIE in the same way. For over five years now, we have generated quarterly reports that combine both summary numbers of select diseases, case numbers, and categories of diagnosis, with qualitative reporting on outbreaks, unusual diagnostic events, ongoing research, and program coordination efforts. These reports are published to the CWHC website and are distributed to our partners quarterly. To see the quarterly reports for 2020, please visit our website.

[www.cwhc-rccsf.ca/quarterly\\_report.php](http://www.cwhc-rccsf.ca/quarterly_report.php)



# KNOWLEDGE mobilization

## OVERVIEW

CWHC surveillance activities culminate in converting our information and assessment into usable advice, technical information, and facilitating processes to turn our outputs into action. These include our quarterly and annual reports, fact sheets and other technical documents as well as our social media presence.

## COMMUNICATIONS

The CWHC actively engages in ongoing efforts to provide information to stakeholders ranging from funding Federal, Provincial, and Territorial government agencies to the wildlife health expert community at large. We also provide a wealth of important information to the public at large, including fact sheets, blog articles and social media posts, to educate and inform Canadians about what signals we are observing in the environment.

## KNOWLEDGE MOBILIZATION IN ACTION - HPAI

The CWHC continued to play a major role in supporting the Highly Pathogenic Avian Influenza Wildlife Dashboard. Coordinated by the CFIA, the dashboard is a public interface that displays suspected and confirmed cases of Highly pathogenic Avian Influenza (HPAI) infections detected in wild birds in Canada. Suspect cases are those that tested non-negative for avian influenza at provincial laboratories (Canadian Animal Health Surveillance Network (CAHSN)) and confirmed cases are those identified as infected with a highly pathogenic strains by the Canadian Food Inspection Agency National Centre for Foreign Animal Disease (NCFAD). The dashboard is interactive and can be searched by species or group of species, province, date collected and status of the animal (dead/live) when sampled.

“With the current Highly Pathogenic Avian Influenza (HPAI) outbreak came an immediate need for the timely sharing and displaying of test results with industry, partners and the public. In response, the CFIA’s Animal Health Science Directorate (AHSD) and the Office of Emergency Management, in collaboration with Environment and Climate Change Canada (ECCC) and the Canadian Wildlife Health Cooperative (CWHC), developed the Highly Pathogenic Avian Influenza (HPAI) in Wildlife Dashboard.

This dashboard, led and maintained by the CFIA, is a public interface that displays suspect and confirmed cases of HPAI infections detected in wildlife in Canada. CWHC has been key in data coordination, sharing and harmonization to allow timely and accurate reporting. The dashboard was first published on April 13, 2022, on the CWHC website in both French and English, and is updated weekly.”



5,486 SOCIAL MEDIA FOLLOWERS

3,896 Facebook

1,040 Twitter

550 Instagram



37 blog posts  
on [blog.healthywildlife.ca](http://blog.healthywildlife.ca)



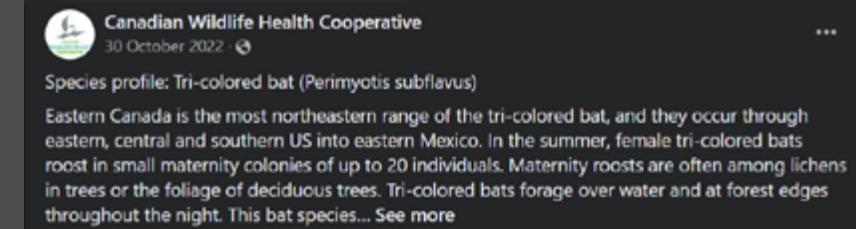
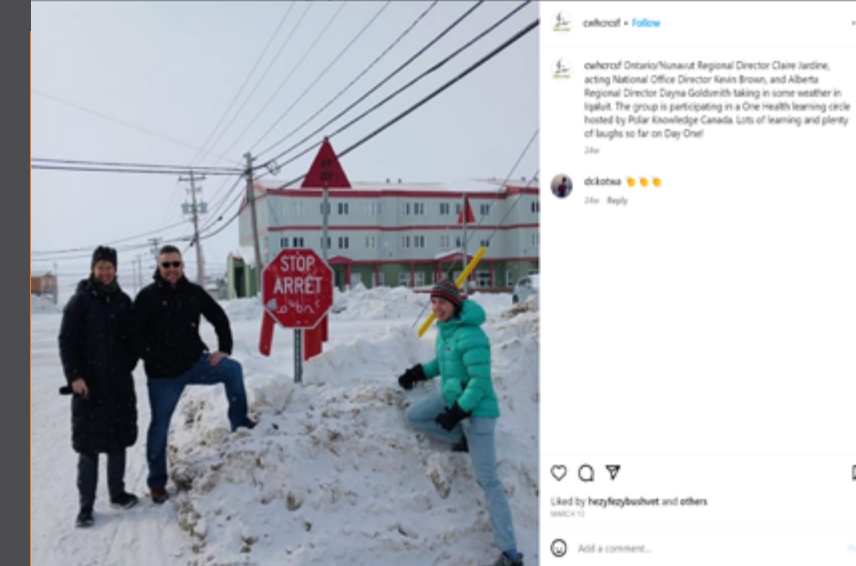
110,775  
website page views  
from over 100 different  
countries  
*[10% increase from  
last year]*



62 MEDIA  
ENGAGEMENTS  
Including over 40 related  
to Highly-pathogenic  
Avian Influenza



53 PUBLICATIONS  
6 technical reports  
47 peer-reviewed articles



## COLLABORATION

### NATIONAL AVIAN INFLUENZA COORDINATION

The ongoing Highly Pathogenic Avian Influenza outbreak provided a timely reminder of why wildlife health and disease surveillance capacity is crucial for the monitoring of zoonotic diseases. If the CWHC had not been able to devote significant capacity to the monitoring of this outbreak, Federal, Provincial, and Territorial (FPT) partners would have had to build this capacity from the ground up at a much higher cost. The CWHC continues to work closely with a full range of FPT partners to ensure that all stakeholders understand the national picture and are able to access resources and expertise in a timely manner. Thanks to the support of ECCC, the CWHC was able to hire a National Avian Influenza Program Coordinator, who started work November. In addition to ongoing surveillance and data management efforts, this new CWHC positions chairs the various collaborative working groups to coordinate strategic planning, surveillance, data collection, and reporting with FPT partners and acts as a liaison between agencies to foster consistent communication between partners.

### CSSP - BUILDING WILDLIFE SURVEILLANCE CAPACITY FOR ENHANCED PANDEMIC PREPAREDNESS

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) made its first appearance in Canada in the spring of 2020. Cases of SARS-CoV-2 have been detected in domestic and farmed animals, which means there is a risk that the disease could spill-over into wildlife. The SARS-CoV-2 virus has evolved leading to several different viral variants which could increase its adaptability to new hosts. Additionally, there has not been much work done on coronaviruses in wildlife.

To address these gaps wildlife surveillance is required for SARS-CoV-2 as well as other pathogens that could move between wildlife and humans. Increased wildlife surveillance will allow us to detect threats to both human and wildlife health.

The goal of this project is to establish a transdisciplinary and responsive wildlife surveillance project for emerging viral threats. The CWHC National Office has played an important role in helping to coordinate the efforts of multiple partners in different discipline areas including Environment and Climate Change Canada (ECCC). Much of the work has also been highly collaborative, with working being done by CWHC Atlantic, Quebec, Ontario/Nunavut, Western/Northern and Alberta, Canadian Food Inspection Agency (CFIA), ECCC, Sunnybrook Research Institute, The University of Saskatchewan, Carlton University and Trent University.



## CASE STUDY NUNAVUT ONE HEALTH LEARNING CIRCLE

Together, Nunavut Tunngavik Inc. (NTI) and Polar Knowledge Canada (Polar) organized a learning circle on the topic of One Health in Nunavut. The Nunavut One Health learning circle occurred over a two-day period on March 13 and 14, 2023 in Iqaluit, NU. It included active participation from various organizations in Canada that have roles and mandates influencing the human, wildlife, and environment interactions in Nunavut and that have an interest in improving coordination on territorial health matters.

Participating organizations included NTI, Polar, the Government of Nunavut (various departments), the CWHC, the Nunavut Research Institute (NRI), and the Nunavut Wildlife Management Board (NWMB). The circle discussed One Health in the context of Nunavut governance structures and agreements. It is a busy and complex governance structure in Nunavut, which is notable as the One Health approach includes creating coordination where complexity exists.

CWHC Regional Directors Claire Jardine (Ontario/Nunavut), Dayna Goldsmith (Alberta), and Kevin Brown (National Office, acting) attended the meeting and left the meeting with a clearer understanding of wildlife health needs in the territory as well as areas of collaboration that may be explored by the CWHC and our Federal and Territorial partners in Nunavut.



## COLLABORATION [cont]

### STUDENT NETWORK FOR AMPHIBIAN PATHOGEN SURVEILLANCE

The Student Network for Amphibian Pathogen Surveillance (SNAPS) enjoyed a highly successful year of operation and was renewed for a further year by Environment and Climate Change Canada (ECCC). SNAPS is a network of students, scientists and educators committed to the conservation of amphibians against the threat of emerging pathogens, with an initial focus on *Batrachochytrium salamandrivorans* (Bsal). This deadly pathogen has yet to be detected in North America but its introduction is likely, making the early detection of Bsal essential for mitigating its negative impact. Unfortunately, early detection is inherently challenging, requiring geographically broad and ongoing surveillance.

SNAPS addresses some of these challenges by combining education and surveillance, allowing students to learn about Bsal through the lens of various academic disciplines and actively contribute by sampling for Bsal among their local amphibians. The dual mission of the network is to facilitate meaningful, experiential learning among students while harnessing their enthusiasm, and geographic breadth to surveil for Bsal across the continent.

Spring/Summer 2022 saw the first implementation of SNAPS in Canada. With financial support from Environment and Climate Change Canada, and in partnership with students from the University of Victoria, University of Lethbridge, University of Toronto, Queen's University, Université de Sherbrooke and Mount Allison University we received a total of 168 samples from five provinces. We are happy to report that no *Batrachochytrium salamandrivorans* (Bsal) was detected in any of the samples. We detected *Batrachochytrium dendrobatidis* (Bd) in British Columbia, Ontario and New Brunswick but not Alberta or Québec. The first year of SNAPS in Canada resulted in some high quality surveillance data and some very happy students. Everyone involved in 2022 surveys has come back for another round and we have recruited additional students from Université Laval (Québec), Memorial University of Newfoundland (Newfoundland) and the Mersey Tobetic Research Institute (Nova Scotia). With ongoing support from Environment and Climate Change Canada, we hope to double the number of samples we run in 2023 over last year's total. We are also beginning to recruit students for the 2024 field season, and we hope to have students sampling in all ten Canadian provinces next year.

For more information about SNAPS visit the SNAPS website: <https://snaps.amphibiandisease.org>

## COLLABORATION [cont]

### WELFARE AND HANDLING RECOMMENDATIONS FOR BAT CENSUSES IN CANADA

It is with great pleasure that we announce the availability of “Welfare and Handling Recommendations for Bat Censuses in Canada” in English and French under the Population and Monitoring subsection on the Resources tab of the Canadian Wildlife Health Cooperative’s Bat Health webpage ([http://www.cwhc-rcsf.ca/bat\\_health\\_resources.php#population-monitoring](http://www.cwhc-rcsf.ca/bat_health_resources.php#population-monitoring) ). This document is the culmination of a three-year project that involved an in-depth literature review, consultation with bat experts across the country, and writing a consensus-based document to reflect the most up to date welfare practices for protection of bat health across jurisdictions. The work was accomplished with a shared funding model between Parks Canada Agency and the Canadian Wildlife Health Cooperative through coordination provided by the Mersey Tobeatic Research Institute and Saint Mary’s University. However, it must be recognized that that this project would not have been completed in such a successful manner without the willingness of those Canadian leaders in bat health, biology, ecology, research, welfare and management with representation from Provincial/Territorial governments, academia, indigenous groups and non-governmental organizations (collectively known as the Canadian Bat Welfare Working Group) to collaborate and freely offer their knowledge, wisdom, expertise and opinions.

The document is not meant to be prescriptive and should be used for pragmatic guidance and recommendations on best practices regarding bat welfare in the most common situations where bats are captured and handled for routine studies in Canada. As such, a suite of options is offered to ensure high standards of bat welfare that are based on the wide range of variables encountered in field conditions that can potentially affect the well-being of the bats in our care while undertaking these activities. Important considerations include age, demographics, stage in the yearly cycle, physiology, and health of bats as well as environmental and other factors that might influence their safety under such circumstances.

Dr. Dave McRuer, a wildlife veterinarian in Parks Canada Agency, CWHC Associate, and a co-author of the document, introduced these recommendations to an international audience during two days of the poster sessions at the recent Wildlife Disease Association Conference in Athens, Georgia July 29 – August 4, 2023. It was welcomed as a much needed and valued resource that will help researchers, animal care committees, and resource managers achieve their goals of protecting the health and welfare of endangered and other bat species throughout North America, but particularly in those areas of higher latitudes where colder temperatures and longer hibernation periods are important considerations.

### WILD HEALTHNET CONSORTIUM

WildHealthNet, developed and implemented by the Wildlife Conservation Society (WCS) in three countries, is a multi-pronged approach addressing the challenges of building wildlife health surveillance systems by focusing on iterative field implementation and policy development, data collection and management systems, capacity building, and management actions. Building on WildHealthNet, our working group will bridge disciplines and scales to identify collaborative and evidence-based solutions. First, a consortium will be formalized to design a coherent framework for the regulation and implementation of wildlife health surveillance systems globally. Second, available data will be synthesized to create a strong evidence base for the efficient scaling of wildlife health surveillance systems.

The CWHC has been engaged with the WCS in providing support for the WildHealthNet program through the deployment and modification of our WHIP database, for use in Laos, Vietnam, and Cambodia. As the project moves into the next phase, including the establishment of a team funded by the Science for Nature And People Partnership (SNAPP), the CWHC’s role now contributes to the strategic planning of how this program can be scaled-up to a global level, with a focus on providing tools and resources to developing nations. The consortium also provides links between wildlife health surveillance networks across the world in order and the CWHC is delighted to be able to leverage our expertise and insights in the pursuit of a larger-scale plan to provide better understanding wildlife health in a global context.

### FISH HEALTH TRACKER

The CWHC has been working for some time with the Canadian Animal Health Surveillance System (CAHSS) to modify our online reporting tools to allow the Fish Health team within CAHSS to receive reports or sick or dead fish and act accordingly. The use of existing tools meant that a response could be mobilized effectively in a shorter period of time than the building a system from scratch. Our web-based and mobile tools were modified to ask specific questions designed to elicit useful information regarding fish health. This tool was then promoted to angling groups in order to facilitate the flow of information back to CAHSS for action and investigation purposes.



What groups of fish did you observe?  
You can choose more than one option:

- Catfish (channel catfish, brown bullhead/mudcats)
- Minnows (shiner, chub, dace, suckers)
- Pikes or Pickerels (pike, walleye, muskie, pickerel)
- Ray-finned fish (sunfish, bluegill, bass, crappie, perch)
- Salmonid (salmon, trout, whitefish, char, grayling)
- Ornamental/invasive fish (carp, goldfish, snakehead)
- Fish in marine waters, not listed above
- Fish in fresh waters, not listed above
- I don't know

Next

# PROGRAM management

## OVERVIEW

CWHC is uniquely suited to address wildlife issues that cross departmental mandates and capacity. It addresses federal objectives of transparent, accountable, and responsive government by (1) filling jurisdiction gaps in wildlife management to create a single comprehensive national wildlife health program; (2) strengthening interactions between governments and citizens; and (3) providing independence that facilitates public trust. It helps track progress on Federal Sustainable Development Strategy by providing an integrated whole-of-government picture of actions and results associated with the wildlife-society interface.

## REVENUES

|   | General             | Targeted            | Total               |
|---|---------------------|---------------------|---------------------|
| Canadian Agricultural Partnership                                       | 0                   | 72,150              | 72,150              |
| Canadian Food Inspection Agency   | 200,000             | 265,302             | 465,302             |
| Environment and Climate Change Canada                                   | 359,038             | 723,231             | 1,082,269           |
| Public Services and Procurement Canada/Canadian Food Inspection Agency  |                     | 165,000             | 165,000             |
| Fisheries and Oceans  |                     | 84,914              | 84,914              |
| Parks Canada  | 160,000             | 58,197              | 218,197             |
| Public Health Agency of Canada  | 300,000             |                     | 300,000             |
| BC Environment  | 10,000              |                     | 10,000              |
| BC Forests, Lands & Natural Resource Operations                         | 10,000              |                     | 10,000              |
| New Brunswick   | 0                   |                     | 0                   |
| Northwest Territories   | 16,000              |                     | 16,000              |
| Nova Scotia   | 10,000              |                     | 10,000              |
| Nunavut   | 15,000              |                     | 15,000              |
| Ontario - Agriculture, Food and Rural Affairs                           |                     | 100,000             | 100,000             |
| Ontario - Health and Long Term Care                                     | 100,000             |                     | 100,000             |
| Ontario - Natural Resources   | 80,000              | 67,491              | 147,491             |
| PEI - Environment   | 4,735               |                     | 4,735               |
| Québec - Ministère des Forêts, de la Faune et des Parcs                 | 142,000             | 69,598              | 211,598             |
| Québec - Ministère de l'Agriculture, des Pêcheries et de l'Alimentation | 42,000              |                     | 42,000              |
| Québec - Ministère de la Santé et des Services sociaux                  | 21,000              | 10,000              | 31,000              |
| Saskatchewan Agriculture and Food                                       |                     | 112,000             | 112,000             |
| Saskatchewan Environment  |                     | 100,000             | 100,000             |
| Yukon   | 14,000              |                     | 14,000              |
| Canadian Wildlife Federation  | 2,500               |                     | 2,500               |
| Western College of Veterinary Medicine                                  | 11,000              |                     | 11,000              |
| Miscellaneous Income/Fee-for-service                                    |                     | 23,831              | 23,831              |
| <b>TOTAL REVENUE</b>  | <b>\$ 1,497,273</b> | <b>\$ 1,851,714</b> | <b>\$ 3,348,987</b> |

## EXPENSES

|                              | General          | Targeted           | Total              |
|------------------------------|------------------|--------------------|--------------------|
| Salaries and Benefits        | 987,687          | 1,107,476          | 2,095,164          |
| Equipment                    | 22,399           | 24,344             | 46,742             |
| Diagnostic Costs             | 128,613          | 373,713            | 502,326            |
| Operations                   | 62,735           | 46,448             | 109,183            |
| Travel                       | 20,505           | 18,862             | 39,366             |
| Other                        | 84,700           | 98,433             | 183,133            |
| Overhead                     | 160,961          | 222,563            | 383,524            |
| <b>TOTAL EXPENSES</b>        | <b>1,467,601</b> | <b>1,891,838</b>   | <b>3,359,438</b>   |
| <b>REVENUE LESS EXPENSES</b> | <b>\$ 29,672</b> | <b>\$ (40,124)</b> | <b>\$ (10,451)</b> |



# COMMUNITY

## OUR COMMUNITY OF PRACTICE

The CWHC is a community – we are a group of people who share a concern for wildlife health and learn how to protect it better by regularly interacting. Our regional and national offices form the core of the community, but our strength comes from our diverse network of individuals and organizations. The partnership among provincial, territorial, and federal government departments, non-government organizations, the private sector and individual researchers and academics allows the CWHC to continue functioning at a high capacity. Fostering this community and **functioning as a “super-connector” among varying mandates and jurisdictions is a key activity of the CWHC and a valued service.** CWHC has played a major role in coordinating national teams (such as for avian influenza and white-nose syndrome), facilitating new approaches (as with our climate change meeting) and ensuring people are connected across the country (as with our new associates policy).

The heart of the CWHC network is individuals whose expertise and dedication contribute to the understanding and improvement of wild animal health in Canada. In addition to staff and CWHC directors are those individuals who work closely with the CWHC and whose activities and expertise align and complement CWHC programs and values; examples include government partners, academics and former staff and directors. We would like to take the opportunity to acknowledge our many partners.



# ASSOCIATES

The CWHC is evolving to meet the unprecedented changes in the environment and wild animal interactions with people. A key element in meeting these challenges is broadening and diversifying our network of partners, associates and collaborators. New policies and processes have been put in place over the past year to ensure that the CWHC develops, acknowledges, and supports ongoing relationships with members of the wildlife health community. A nomination and review process to identify and recognize potential or existing partners is now in effect. Eleven individuals have already been appointed as CWHC Associates. A complete list of these individuals along with their biographies can be found on the CWHC website at [www.cwhc-rcsf.ca/associates](http://www.cwhc-rcsf.ca/associates).

## 28 GRADUATE STUDENTS

|                          |   |
|--------------------------|---|
| <b>BC</b>                | 5 |
| <b>Western/Northern:</b> | 2 |
| <b>Ontario/Nunavut:</b>  | 8 |
| <b>Québec:</b>           | 5 |
| <b>Atlantic:</b>         | 8 |

## 21 ASSOCIATES / AFFILIATES

|                          |   |
|--------------------------|---|
| <b>National Office:</b>  | 4 |
| <b>British Columbia:</b> | 1 |
| <b>Alberta:</b>          | 4 |
| <b>Western/Northern:</b> | 1 |
| <b>Ontario/Nunavut:</b>  | 1 |
| <b>Québec:</b>           | 3 |
| <b>Atlantic:</b>         | 7 |



## STAFFING & NETWORK

### CWHC NATIONAL OFFICE

**Damien Joly** - Chief Executive Officer  
**Patrick Zimmer** - Chief Operations Officer  
**Kevin Brown** - Information Services Manager  
**Bevan Federko** - Programmer/Analyst  
**Jackson Schuler** - Programmer/Analyst  
**Nataliya Morgun** - Accountant  
**Jordi Segers** - National White-Nose Syndrome Coordinator (*Charlottetown*)  
**Carolyn Blushke** - Program Coordinator  
**Rachelle Lockwood** - Program Coordinator

### CWHC BRITISH COLUMBIA

**Chelsea Himsworth** - Regional Director  
**Caeley Thacker** - Regional Director  
**Cait Nelson** - Assistant Regional Director  
**Kaylee Byers** - Assistant Regional Director  
**Glenna McGregor** - Veterinary Pathologist

### CWHC ALBERTA

**Dayna Goldsmith** - Regional Director  
**Jamie Rothenburger** - Co-director

### CWHC WESTERN/NORTHERN

**Trent Bollinger** - Regional Director  
**Lorraine Bryan** - Veterinary Pathologist  
**Véronique Savoie-Dufour** - Veterinary Pathologist  
**Ursula Perdrizet** - Veterinary Pathologist  
**Erin Moffatt** - Wildlife Biologist  
**Katelyn Luff** - Wildlife Biologist  
**Michaela Barnes** - Wildlife Biologist

### CWHC ONTARIO/NUNAVUT

**Claire Jardine** - Regional Director  
**Brian Stevens** - Veterinary Pathologist  
**Lenny Shirose** - Biologist  
**Laura Dougherty** - Wildlife Technician  
**Maria Alexandrou** - Communications Coordinator  
**Daniel Bayley** - Communications Coordinator

### CWHC QUÉBEC

**Stéphane Lair** - Regional Director  
**Kathleen Brown** - Lab Manager  
**Judith Viau** - Wildlife Technician  
**Viviane Casaubon** - Wildlife Technician  
**Benjamin Jakobek** - Veterinary Resident  
**Shannon Ferrell** - Veterinary Resident

### CWHC ATLANTIC

**Megan Jones** - Regional Director  
**Laura Bourque** - Veterinary Pathologist  
**Darlene Jones** - Wildlife Technician  
**Fiep de Bie** - Wildlife Technician  
**Darrian Washinger** - Atlantic bat conservation project technician  
**Scott McBurney** - Veterinary Pathologist (retired)

## ACKNOWLEDGMENTS

The CWHC would like to thank all our sponsors, partners, and collaborators for their continued support. Without this crucial network of funding and collaboration, we would not be able to offer the comprehensive national programs that we do. A very special thanks to Matilde Tomaselli for providing the photos for this report. Matilde is a researcher with Polar Knowledge Canada who spends a large part of her time working closely with Inuit communities across Nunavut. Matilde was a very gracious host and tour guide when members of the CWHC were invited to participate in the One Health Learning Circle in Iqaluit in March, 2023.





CANADIAN  
**WILDLIFE HEALTH**  
COOPERATIVE

