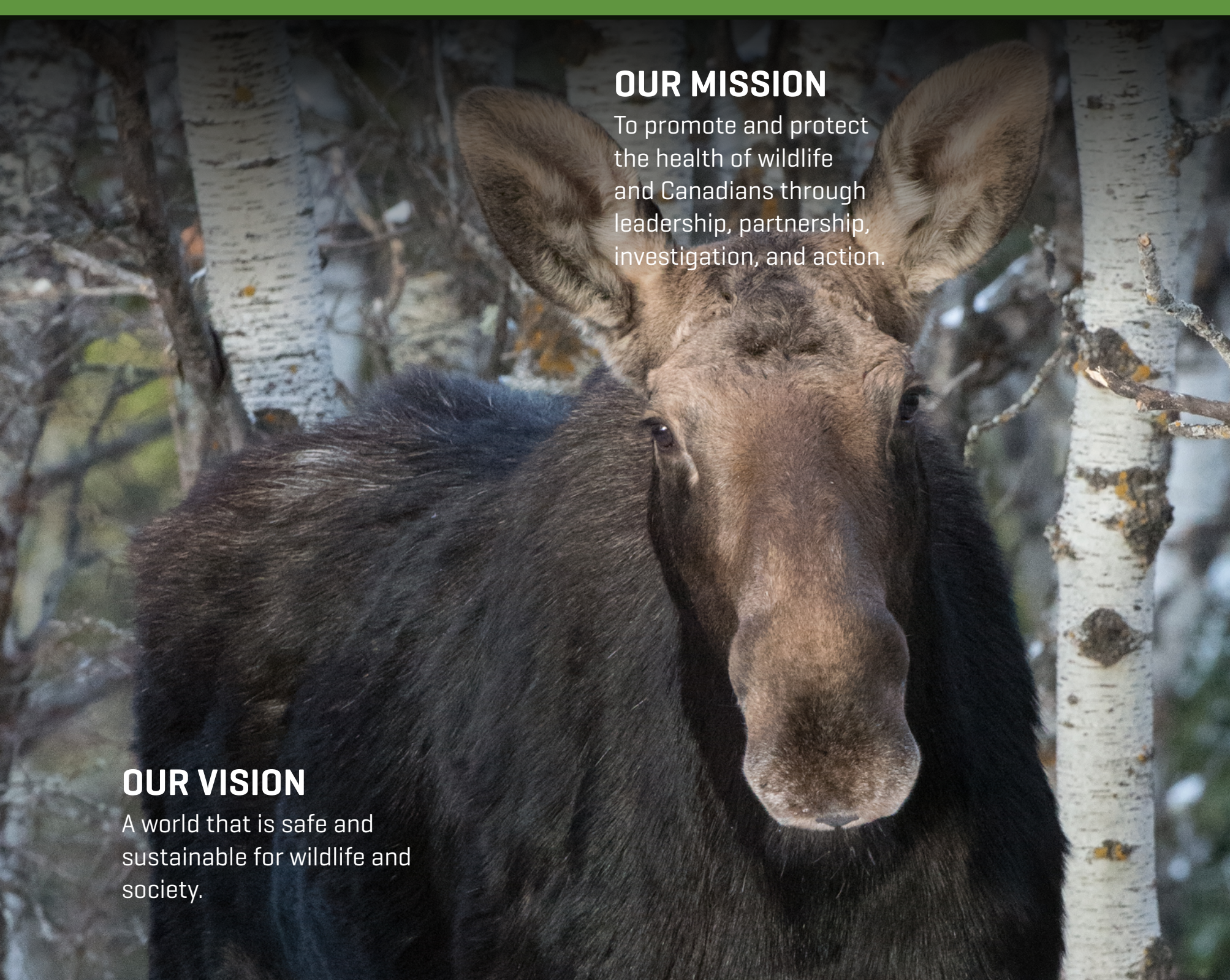




CANADIAN
WILDLIFE HEALTH
COOPERATIVE

ANNUAL REPORT

2021-2022



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 Executive Director

SARS-CoV-2 (Covid-19), avian influenza, chronic wasting disease and many wildlife health issues highlight the interconnections between animals, domestic and wild, humans and the environment. These health issues and others greatly affect our well-being, many emerging infectious diseases have an animal origin and our own actions can negatively impact our own health, the health of wildlife and our agricultural and economic prosperity. The CWHC continues to be a leader in advocating a One Health approach. We have been at the forefront of One Health for over 30 years providing leadership, expertise and vital services to our partner organizations and Canadians. We are the front line in the current avian influenza outbreak and in partnership with many levels of government, academia, industry and stakeholders we lead and coordinate national initiatives such as bat health and recovery in Canada (following the devastating impacts of White-nose Syndrome), the development of a National Invasive Pig Control Strategy and many more. By anticipating and responding to wildlife health issues we have provided national responses to varied and increasingly frequent issues which directly benefit ourselves and Canada, our health, economy and overall wellbeing.

This past year has not been without challenges, societal and partner needs greatly outstrip capacity and resources and the CWHC continues to advocate and work with partners, including NGO's and the green budget initiative to implement and fund the Pan-Canadian Approach to Wildlife Health. We are also actively restructuring and updating our governance structure, working closely with our University partners and Veterinary College hosts to ensure the CWHC can adapt and meet the growing national and global wildlife health issues.

I would like to thank everyone who has contributed to our successes, wildlife health in Canada is truly a collaborative effort. In particular I wish to thank CWHC staff and regional directors, our veterinary college and University hosts, Federal/Provincial/Territorial partners, as well as our NGO collaborators and international partner centres and organizations. I look forward to our ongoing activities moving forward.

PATRICK ZIMMER
CWHC Executive Director

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



CASE STUDY

BIRD MORTALITIES CAUSED BY COLLISIONS WITH CLEAR GLASS DECK RAILINGS

Most people are aware of the dangers of windows to birds, but all too often we forget about other architectural uses of glass, such as glass railings. The toll on local birdlife can be extensive as birds cannot perceive glass. Glass railings are especially dangerous, as birds see the vegetation beyond and attempt to fly-through with disastrous results.

In the spring of 2021, CWHC Atlantic has received numerous reports of bird mortality related to glass railings. The incidents happen in both urban and rural settings. Even if homeowners do not witness the collisions firsthand, the chances are their railings are still causing mortalities as very often birds will fly off after the impact to die of injuries elsewhere, or the body may have been scavenged by a predator before it is found by home owners.

The information below was provided by FLAP Canada in their blog written by John Carley on October 1, 2020. Here is the link: <https://flap.org/mitigating-glass-railings/>

How to prevent bird collisions with glass railings?

The best solution, when planning your residential project, is to select a railing style other than glass. Select a non-reflective material to form panels or railings; wood or metal are the preferred choices.

An effective means of preventing collisions with glass railings and windows is to incorporate visual markers, closely spaced, on the exterior surface of the glass. An overlay of dots, stripes, or patterns at approximately 2”x 2” (50mm x 50 mm) spacing can be placed on the glass. The glass itself could be etched or patterned using the same spacing. Items that can be used are decorative window decals or felt markers specific for glass use. This will alert an approaching bird that these railings are obstacles to be avoided. Grid patterns or stripes are the most common.

It is estimated that up to a billion birds a year are killed in North America due to collisions with buildings and architectural elements. Avoiding the use of glass railings is the best approach, but making your glass railings bird-safe is a simple and easy task. Both solutions have a great environmental pay-back.



MONITORING [cont]

FIRST EVIDENCE OF THE COVID-19 VIRUS IN CANADIAN WILDLIFE IN THE WILD: WHITE-TAILED DEER INFECTED WITH SARS-COV-2

For the first time since the beginning of the COVID-19 pandemic, the SARS-CoV-2 virus has been detected in free-ranging animals in Canada. Last November, the analysis of samples taken from three white-tailed deer (*Odocoileus virginianus*) from the Estrie region of Quebec revealed the presence of the virus responsible for COVID-19. These white-tailed deer were sampled at a large game recording station between November 6 and 8, 2021 as part of a monitoring activity put in place by the Ministère de la Forêt de la Faune et des Parcs. The positive animals appeared to be in good health and did not show clinical signs. Detection of the virus has been confirmed by the National Centre for Foreign Animal Disease of the Canadian Food Inspection Agency.

This discovery is not surprising, because the presence of SARS-CoV had already been detected in white-tailed deer in several regions of the United States. It is believed that wild deer are infected via humans, since the viral variants isolated from humans matched variants present in nearby human populations during the same period. White-tailed deer can potentially become infected either through direct contact (supplemental feeding, research activities) or through indirect contact by sharing peri-urban habitat with humans. However, the route of transmission of the virus to wildlife remains uncertain. White-tailed deer appear to develop a subclinical infection (no evidence of disease), but can still transmit the virus to other deer effectively.

SARS-CoV-2 is already responsible for multiple outbreaks in captive wild animals, especially in big cats and non-human primates in zoological institutions. However, there is still little data on the importance of the virus in wild animal populations. At this time, there is no data that suggest that white-tailed deer are able to infect other species, such as humans. However, it is still recommended to take basic protective measures when in contact with a white-tailed deer (gloves, mask and protective glasses).

In Canada, a continuous surveillance program targeting wild species potentially susceptible to this infection is underway with the collaboration of the various regional centres of the CWHC. This surveillance is part of the actions to fight against the current pandemic, in order to identify a natural reservoir.



MONITORING [cont]

HIGHLY PATHOGENIC H5N1 AVIAN INFLUENZA OUTBREAK IN WILD BIRDS

In January of 2022, the Canadian Food Inspection Agency (CFIA) confirmed a positive case of Highly Pathogenic Avian Influenza (HPAI) in Newfoundland. The animal was collected in November of 2021 and was followed by further cases in Newfoundland and Nova Scotia in January. February saw the disease spread into other provinces after being confirmed in Prince Edward Island and British Columbia. The virus has now been detected in all Canadian provinces and the Yukon. A total of 96 confirmed cases of HPAI were confirmed by the CFIA in the first quarter of 2022.

This virus mainly infects aquatic birds which can be asymptomatic carriers (do not develop the disease). Mortalities have been documented in a large number of wild bird species including different species of ducks, geese, gulls, birds of prey and corvids (e.g., American crow). Most sick birds infected with this virus show neurological signs (shaking of the head, incoordination, inability to fly or move).

Although highly pathogenic in birds, this strain of influenza virus rarely infect people. In fact, despite having been present in Europe for almost 2 years, only one human case of infection has been documented in England in January 2022 (this person had no symptoms and worked in a contaminated domestic poultry farm). No human cases have been identified in Canada so far. Nevertheless, it is still recommended to follow certain basic measures in order to reduce the risk of exposure to avian influenza and other potential zoonotic agents. For example, avoid handling wild birds with bare hands, or if contact cannot be avoided, wear gloves and wash your hands with soap and hot water (or with a hydroalcoholic solution).

In conjunction with the Canadian Food Inspection Agency (CFIA), Environment and Climate Change Canada (ECCC) and the Public

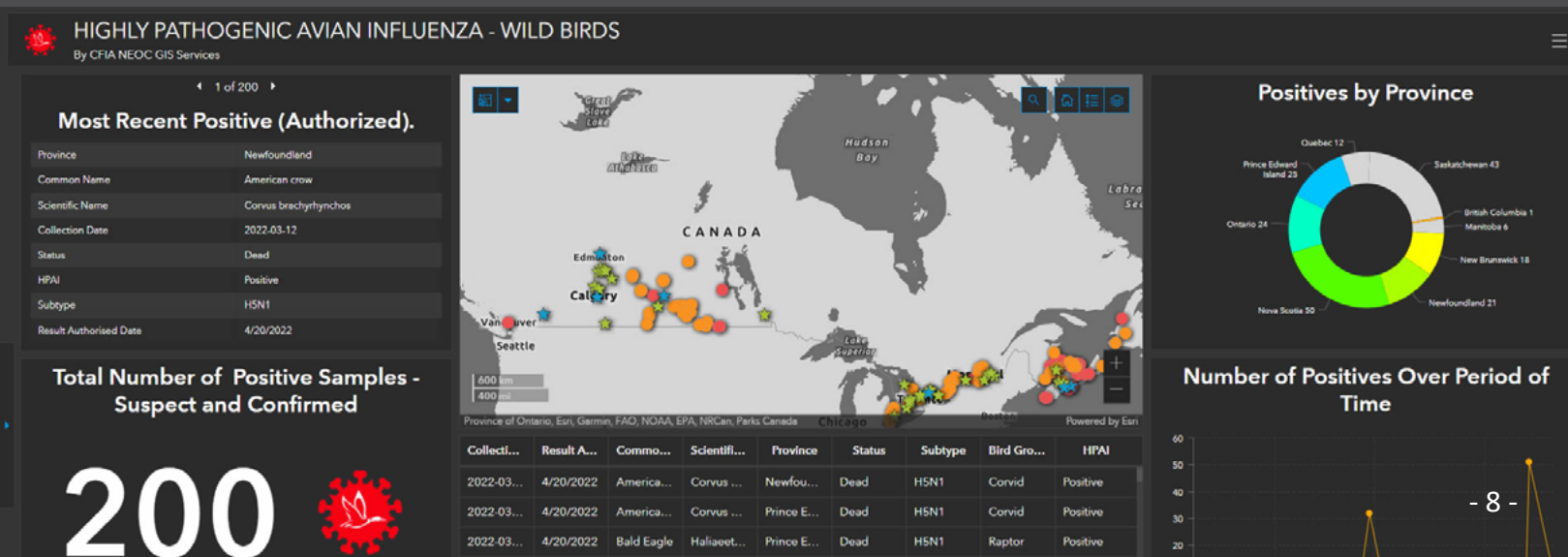


Health Agency of Canada (PHAC), the CWHC has been an integral part of the national response to this outbreak and has been involved both in testing at the local level and coordination and strategic planning at the national level. In addition to testing dead birds and sending non-negative and suspect samples for confirmatory testing, the CWHC continues to provide a bi-weekly national Avian Influenza summary to Federal, Provincial, and Territorial (FPT) partners and has expanded this reporting to include HPAI-specific data. The CWHC regional staff and National Office have also been answering a high volume of inquiries, through our online reporting system as well as via phone and email, from members of the public reporting sick and dead birds. This response capacity has been a highly valuable resource for our Federal partners in managing the communication and messaging around the current outbreak.

WILD BIRDS DASHBOARD

The CWHC National Office has also been part of a working group tasked with putting together a National HPAI dashboard. Coordinated by the CFIA, the Highly Pathogenic Avian Influenza - Wild birds 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.

<https://cfia-ncr.maps.arcgis.com/apps/dashboards/89c779e98cdf492c899df23e1c38fdbbc>



MONITORING [cont]

CANINE DISTEMPER VIRUS: OUTBREAK IN KINGSTON

Since the beginning of May, 2021, the Canadian Wildlife Health Cooperative Ontario/Nunavut (CWHC) received a number of calls regarding sick raccoons in the city of Kingston. We reached out to a local wildlife rehabilitation centre to see if they too, noticed a spike in abnormal raccoon activity. To our surprise, Sandy Pines Wildlife Centre (SPWC) reported that they were receiving on average, 2-3 sick raccoons per day! With recent testing, we have been able to confirm that the Kingston raccoon population is experiencing a Canine Distemper Virus (CDV) outbreak.

SPWC graciously agreed to send us four of their most recent raccoon samples for post-mortem examination in our lab. The first raccoon examined had unfortunately suffered trauma, which explained its clinical signs. The remaining three raccoons all had similar symptoms (wandering aimlessly, unusual behavior, and other neurological symptoms) and all had evidence of discharge from their eyes. All three of these raccoons tested positive for CDV and had microscopic lesions consistent with CDV infection. Based on these findings, CDV was confirmed to be the cause of the clinical signs of these three raccoons. All four submitted raccoons tested negative for rabies virus.

What does this mean for the residents of Kingston and surrounding areas? Since there is currently no effective treatment for CDV, the best possible response is prevention! As seen in our last article discussing distemper posted here you can help by:

1 – Protecting our wildlife. Ontario is home to a rich abundance of wildlife that face increasing risk from disease, loss of habitat and other human activities. We can all help protect our wildlife by viewing from a distance, refraining from feeding wild animals, and supporting local initiatives that promote the coexistence of people and wildlife. In addition to reporting sick and deceased wildlife to the CWHC (Toll-free: 1-866-673-4781), please contact your local wildlife rehabilitation facility to help wildlife in need of medical assistance. Contact a licensed wildlife rehabilitator near you: <https://www.ontario.ca/page/findwildlife-rehabilitator>

2 – Protecting our pets. Distemper can be fatal for our pets. That's why it is tremendously important to keep up to date with routine vaccines as recommended by your veterinarian – vaccination is the best way to prevent CDV transmission. To prevent accidental contact with wildlife, keep cats indoors, and always keep dogs on a leash/supervised while outdoors. If you think your pet has been in direct contact with wildlife, please contact your veterinarian for advice.

3 – Protecting ourselves. It is essential to recognize that there is overlap in the clinical signs seen in animals with rabies and distemper. Both diseases affect raccoons and other species, including skunks, foxes, coyotes, badgers, fishers, and mink. Rabies virus is transmissible to humans and poses a serious health risk if there is direct contact with an infected animal. Therefore, not only is it important to keep your pets safe to protect them against both diseases, but it is also vital in protecting yourself. If you think you may have been exposed to rabies you should contact your doctor or local public health unit.



MONITORING [cont]

GENERAL SURVEILLANCE

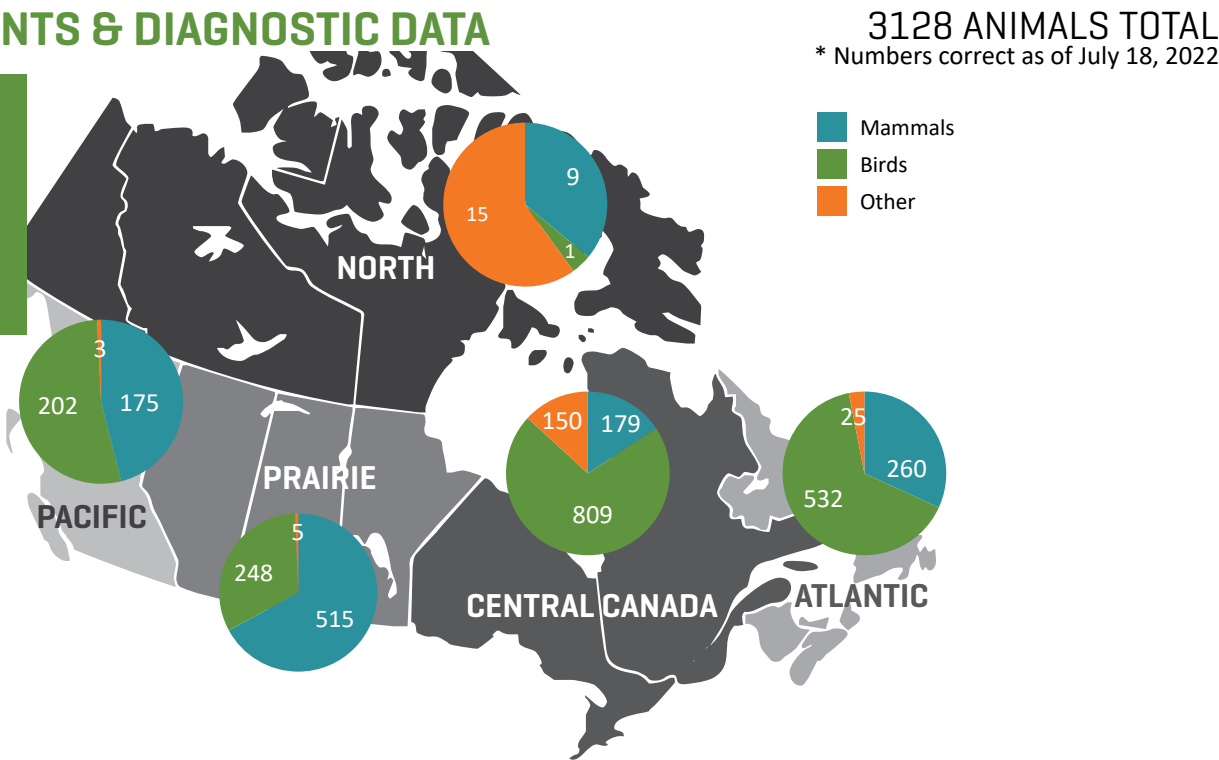
Scanning surveillance activities are a foundation of CWHC programs. By investigating causes of death and disease, the CWHC tracks changes in endemic diseases, discovers emerging diseases and interprets and communicates these findings to stakeholders that cross ministries, governments and sectors. The 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.

DISEASE COUNTS & DIAGNOSTIC DATA

REGION TOTALS

Pacific	380
Prairie	768
Central Canada	1138
Atlantic	817
North	25



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	226	0
Avian Cholera	226	2
Avian Influenza	1055	8
Bovine tuberculosis	330	0
Canine distemper	897	55
Chronic wasting disease	329	87
Newcastle Disease	559	1
Rabies	2019	27
Snake fungal disease	28	2
West Nile Virus	1590	33
White nose syndrome	310	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 : WHIP/SMART INTEGRATION

To help establish national wildlife health surveillance systems in Southeast Asia under a One Health approach WCS is using WHIP for data management .This international effort in Laos, Cambodia, and Vietnam, was launched in 2018. Synchronizing work with an international group like the WCS and adapting WHIP to meet specific needs highlighted the potential WHIP could have in addressing national and regional One Health data management needs. Data management is core to standing up effective national wildlife health surveillance systems, which are needed to complement existing public health and domestic animal surveillance. WCS has facilitated the integration of data management into the creation of national wildlife health surveillance policies formulated by government agencies and other stakeholders and developed local capacity in its use.

The expertise that WCS has provided in planning out this process and making modifications to WHIP stand to benefit both current and/or future users of the platform, depending on their specific data management requirements. This capacity comes from the extensive experience in planning and coordinating projects on this scale and large-scale data management capacity that WCS team members have. The CWHC is currently engaged in a major set of customizations for WCS which will include the WCS instance of WHIP becoming integrated with a third-party application (SMART) and become more aligned with their data collection and reporting requirements. Additional scheduled customizations will contribute to providing greater flexibility in the types of data hosted by WHIP, accommodating greater variety of research projects, study designs, or sample types for WHIP users. The aim of both the CWHC and the WCS is that this integration will enable WHIP/SMART to become a powerful tool for many different groups engaged in active surveillance, especially in economically challenged parts of the world.

Any time we integrate an external organization into our data management platform, we are given an opportunity to review our own internal processes and learn lessons from the way that other organizations operate. This is also true in the opposite direction, with CWHC’s decades-long data management experience being a valuable resource for those organizations. This two-way benefit is a truly unique opportunity that is afforded us by collaborating around a common technological solution and it is our ambition to make the system as broadly useful as possible to a wider array of users. We are working closely with the WCS to realize the full potential of WHIP and are looking at a variety of different options for how it could be operationalized on a larger scale.

REGULATORY REPORTING

The CWHC uses 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.

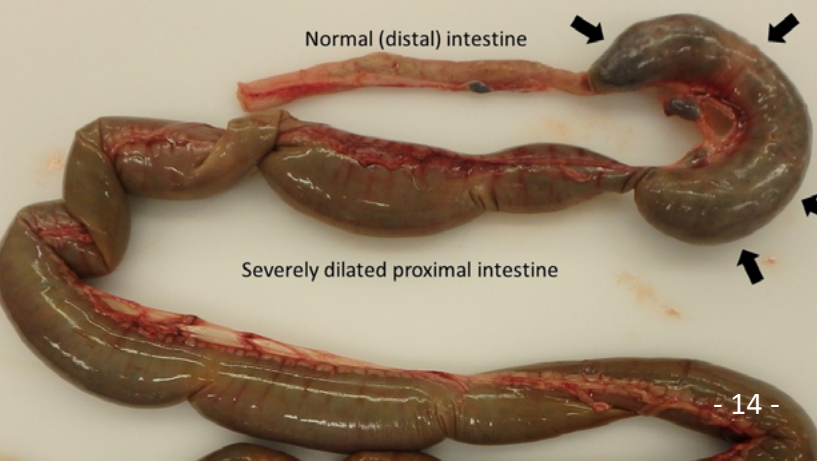
www.cwhc-rcsf.ca/quarterly_report.php

CASE STUDY

INTESTINAL IMPACTION BY SUNFLOWER SEED SHELLS IN TWO RACCOONS IN QUEBEC

Here we report the death of two raccoons associated with excessive consumption of sunflower seeds. These two raccoons were found in the Sherbrooke region (southern Quebec) in August and October. One of the raccoons was found dead, the other exhibited abnormal behaviour and was euthanized for humanitarian reasons. In both cases, impactions with sunflower seed shells were present in the large intestine. The intestinal portions upstream of these impactions were dilated. These intestinal impactions were made up of extremely compact clumps of sunflower seed shells completely blocking the intestinal segment. These intestinal impactions were identified as the cause of death and clinical signs observed in these raccoons.

It can be proposed that these two raccoons had access to a very high quantity of sunflower seeds, either directly from a high capacity bird feeder, or from unsecured sunflower seed bags. It is important to mention that the ingestion of a small quantity of sunflower seeds that would have fallen from a bird feeder would likely not represent a health risk to raccoons. Bird feeding is an activity that is gaining in popularity, allowing us to nurture our interest for the conservation of the peri-urban fauna. That being said, it is advisable to take certain measures that will minimize the negative impacts of this practice on the health of wildlife.



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.



5,233 SOCIAL MEDIA FOLLOWERS
3,760 Facebook
1,011 Twitter
462 Instagram



42 blog posts
on blog.healthywildlife.ca



100,939
website page views
from over 100 different
countries
*[100% increase from
last year]*



66 MEDIA
ENGAGEMENTS
Including over 10 related
to Highly-pathogenic
Avian Influenza



55 PUBLICATIONS
9 technical reports
46 peer-reviewed articles



COLLABORATION

COLLA'BEER'ATION AND CONSERVATION!

Recently the CWHC Atlantic region, based at the Atlantic Veterinary College at UPEI, was awarded \$2500 to contribute to their work in helping save the endangered North Atlantic right whale. These funds were made possible through a colla'beer'ation between Big Spruce Brewing and the Ocean Tracking Network.

Big Spruce's Tag! You're It

This partnership began in 2017 with 50 cents from every can of Big Spruce's Tag! You're It! (TYI) beer being allocated to non-profit organizations in Canada that focus on marine research, education, and conservation including the Marine Animal Response Society (MARS) and others. Dubbed 'conservation in a can' this conservation financing partnership has raised more than \$84,000 (and counting)!

For the next two years, the TYI initiative will focus on the critically endangered North Atlantic right whale and the various organizations who work tirelessly to save them from extinction including MARS, the CWHC and others. So far in 2020, more than 58,000 cans of TYI were sold across Canada!

"These recipient organizations play a critical role—their work can make the difference between life and death for these whales," Fred Whoriskey, executive director of the Ocean Tracking Network.

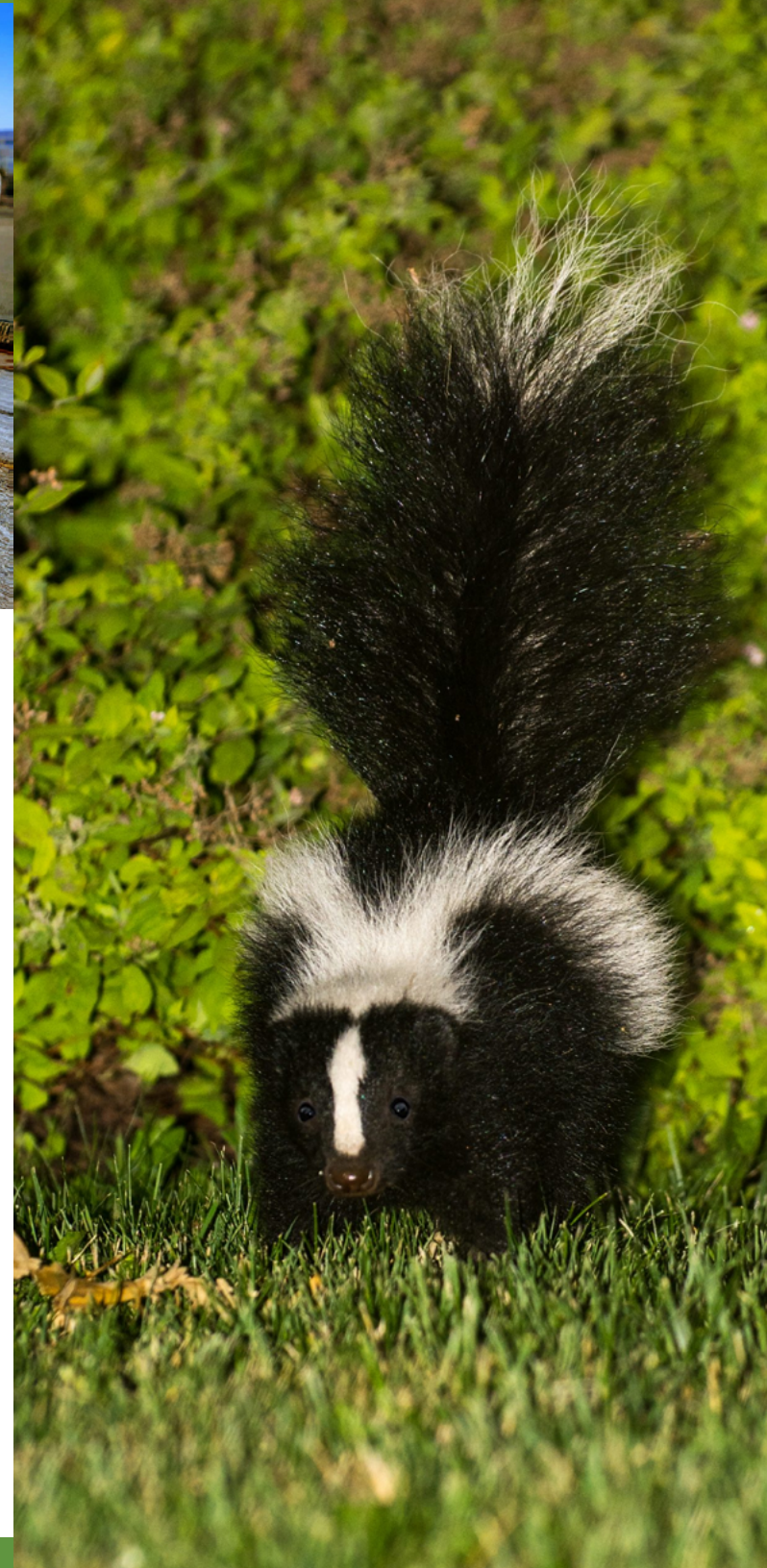
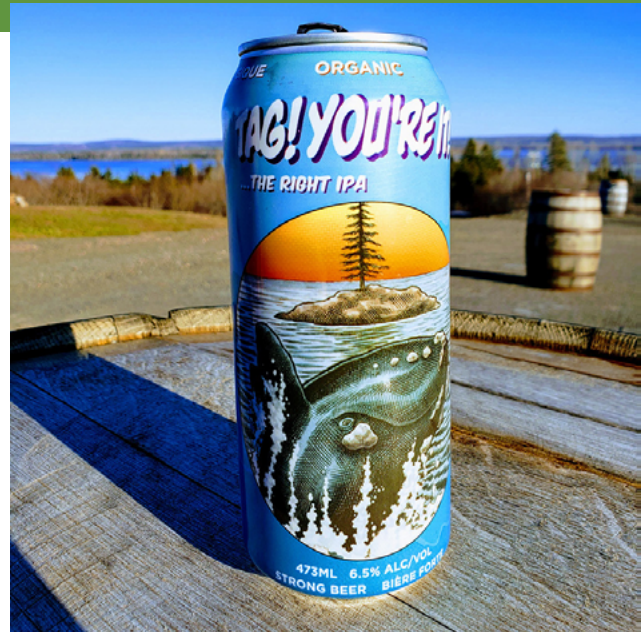
The CWHC Atlantic region was thrilled to be a recipient of these funds and the money will go towards ensuring their team has the resources to respond to incidents involving the whales.

"We're honoured to have been chosen alongside several other deserving groups who all support right whale conservation. This initiative is also a great way to engage the public and raise awareness. " Megan Jones, Regional Director of the CWHC Atlantic Region.

For more information on this fantastic initiative and how you can support it go to the Big Spruce Brewery [website](#).

To find out more about the Ocean Tracking Network and the important work they do visit their website:

<https://oceantrackingnetwork.org/>



CASE STUDY SKUNK ADENOVIRUS-1 IN P.E.I.

Striped skunks all over the world have acquired a notorious reputation for spraying foul-smelling material from their hind ends at potential predators. In the last few years, a new virus called skunk adenovirus-1 has been detected in PEI striped skunks, causing disease and death in affected individuals.

Skunk adenovirus-1 was first diagnosed in an Ontario striped skunk in 2015 and has subsequently been diagnosed in striped skunks, grey foxes, eastern porcupines, African pygmy hedgehogs, raccoons, and pygmy marmosets. Infected animals typically show signs of nasal discharge, acute pneumonia, and lethargy. The most commonly reported lesions include severe bronchopneumonia and also hepatitis. Since it was first diagnosed in 2015, the behavior, transmission and prevalence of skunk adenovirus-1 in free-ranging wildlife has remained a mystery to researchers. Other adenoviruses tend to be host-specific (infecting and causing disease in a single host species) and are often associated with other factors causing immunosuppression. However, skunk adenovirus-1 can cause disease in multiple host species and in animals with no evidence of underlying immunosuppression. There are several cases of porcupines that are known to have recovered from Skunk adenovirus-1 infection with subsequent release back into the wild, however the majority of sick individuals die from disease.

The prevalence of skunk adenovirus-1 in the Prince Edward Island skunk population is currently unknown, as are the potential impacts it may be having on regional populations.



COLLABORATION [cont]

STUDENT NETWORK FOR AMPHIBIAN PATHOGEN SURVEILLANCE [SNAPS]

The Student Network for Amphibian Pathogen Surveillance (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 is a new surveillance program that 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.

In partnership with Environment and Climate Change Canada (ECCC) and students and faculty from several universities across Canada, the CWHC will be instrumental in bringing SNAPS to Canada by acting as the hub of the network in Canada and coordinating the 2022 pilot project.

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

There is a brief (13 min.) but excellent video introducing SNAPS in the context of the Strategic Plan here:

<https://www.youtube.com/watch?v=5H2qcQxxAE>

There is a video recording of the SNAPS Canadian information meeting held in Spring 2021 here: <https://www.youtube.com/watch?v=3GIfMWntdLY> (run time 1 hour) that introduces the program in more depth. This includes Q and A for issues including eligibility, details about how the program works, and firsthand accounts of the experiences of two educators who have participated in the American pilot project.



COLLABORATION [cont]

FUNDY NATIONAL PARK BAT MONITORING

Bat observations in Fundy National Park had been scarce in recent years, so we were excited to see several bats roosting and flying around park headquarters last summer. The Resource Conservation team at Fundy decided that this was a great opportunity to try out our ultrasonic acoustic bat recorders.

We knew from visual observations that big brown bats (*Eptesicus fuscus*) were present, but we wanted to know if any other species made Fundy National Park home. During the late summer and fall of 2020, we installed acoustic recorders at several locations around park headquarters, including park buildings and a pond near the coast. When I collected the recording equipment and looked at the ultrasonic audio files that were generated, I was delighted to see that we'd captured many recordings of bats! Acoustic identification of bats can be tricky though, and I needed some guidance for this all-important step.

Fortunately, because I had reported our bat observations to the Bat Information Hotline (1-833-434-2287), I was already in conversation with the Canadian Wildlife Health Cooperative (CWHC), who was developing training and guidelines for acoustic monitoring of bats in Atlantic Canada. How serendipitous! And so, last winter I attended a free webinar for bat acoustic monitoring hosted by the CWHC and pored over their Guide for Bat Monitoring in Atlantic Canada. These resources allowed me to develop the foundational skills I needed to start analyzing the audio files from Fundy National Park.

Using a program called Kaleidoscope, I was able to view spectrograms of the audio files. By looking at the frequencies, slope, and pattern of the calls (and with regular reference to the Guide for Bat Monitoring in Atlantic Canada's Acoustic ID Decision Tree), I was able to identify the species responsible for some of the calls we'd recorded. As expected, we found a number of calls made by big brown bats, but it soon became apparent that there was more than just one species of bat in Fundy.

I was delighted to see calls from *Myotis* species, whose populations in this region were decimated by white-nose syndrome. It is not always possible to distinguish calls from the two *Myotis* species, but a handful of audio files had call characteristics indicating that both the little brown myotis (*Myotis lucifugus*) and the northern myotis (*Myotis septentrionalis*) could be present in the park. The pleasant surprises continued as I analyzed more audio files – we had also captured recordings of the three migratory species known from this region: the hoary bat (*Lasiurus cinereus*), the eastern red bat (*Lasiurus borealis*), and the silver-haired bat (*Lasionycteris noctivagans*). There was even evidence of the tri-colored bat (*Perimyotis subflavus*), a species that has not been identified in the province since 2013.

It seemed too good to be true that I'd found evidence of all the bat species known from the province here in the park. I needed a second opinion, so I shared some files with Tessa McBurney, Atlantic Bat Conservation Project

Technician with CWHC. Tessa took the time to analyze the files herself, and reached the same conclusion: that we'd captured recordings of all seven species in the park! She also added the important note that, because it has been eight years since the tri-colored bat was identified in the province, additional evidence would be necessary to confidently confirm this species' presence.

This summer, buoyed by the success of last year's survey, we are undertaking a more intensive study of bats in the park. We have already deployed recorders on several buildings. We plan to analyze the recordings to determine which park buildings are likely to house bats, then follow up with emergence surveys at dusk to confirm. By identifying buildings that function as bat habitat, we can ensure protection for the animals by proactively mitigating potential impacts during building use, renovation, and demolition.

We will also be collecting and analyzing acoustic data from four different habitats in the park (one of which was selected to target the tri-colored bat) following North America Bat Monitoring Program (NABat) standardized methodology. The methods specified by NABat facilitate the creation of consistent data that can be used for conservation planning at a range-wide scale. Following these standards, we plan to begin collecting stationary acoustic survey data from these four locations at the same time every year. Long-term monitoring like this will help us better understand how bats are using Fundy National Park.

We are also very excited about a citizen science program for park visitors – Backcountry with Bats. Backcountry campers can sign out a small ultrasonic microphone to bring to their campsite. This microphone plugs into campers' smartphones and, using a free app, can record calls from bats flying overhead and identify the most likely species in real-time. This program will provide some data from remote backcountry areas, but we also hope to generate

excitement about bats and create stewardship mindsets that visitors will take with them once their stay in the park is over.

One year ago, we knew very little about the current state of bats in Fundy National Park. Most would agree that the situation seemed bleak. Today we are feeling much more hopeful, having seen evidence of so many species in the park. These findings would not have been possible without collaboration with the CWHC. Their training webinar was educational and engaging; the guide they published provided clear direction for all the work we've undertaken; and the correspondence I've had with them was both helpful and personable.

We owe the CWHC a big thank you for helping Fundy National Park's bat monitoring program spread its wings and fly!

Megan Blaxley
Resource Management Officer
Fundy National Park



COLLABORATION [cont]

BAT HEALTH AND WELFARE

The care and welfare of wildlife during research and management projects are of the utmost importance to individuals involved with such activities due to their wish not to harm the species that they so deeply care for, especially in instances that involve their capture and handling. Therefore, it is critical to continuously review the techniques involved with these procedures and ensure the most up-to-date practices and procedures are recommended to mitigate and prevent any unanticipated harm to animals in such circumstances.

In consideration of bats, the *Canadian Council on Animal Care Species-specific Recommendations on: Bats* (2003) was the Canadian standard. However, since its publication, several Canadian bat species have been listed as endangered; diseases such as white-nose syndrome and SARS-CoV-2 have emerged with actual or potential impacts on bat populations; and there have been recent advances in research techniques and equipment that require consideration to ensure that they are not contributing to further stress on bats.

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. The first step was completed with Parks Canada Applied Science funding in March 2021, and subsequent funding from that same source permitted the last two steps to be completed January – March 2022. In the end, 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*. Subsequently, this document was reviewed by Environment and Climate Change Canada and translated into French prior to a planned presentation to the Canadian Wildlife Directors Committee in June 2022 for their consideration. It will also eventually be shared with the broad bat health community of practice with the goal of receiving further feedback prior to publishing it in a peer reviewed journal.

During capture and handling, it is essential that the possibility of negative outcomes and harmful effects from adverse procedures are considered so that they can be anticipated and prevented in the future. 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.



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 Food Inspection Agency	150,000	253,537	403,537
Environment and Climate Change Canada	440,000	361,315	801,315
First Nations and Inuit Health Branch	4,972		4,972
Fisheries and Oceans		15,000	15,000
Parks Canada	150,000	15,000	165,000
Public Health Agency of Canada	290,000		290,000
BC Environment	10,000		10,000
BC Forests, Lands & Natural Resource Operations	10,000		10,000
New Brunswick	10,259		10,259
Northwest Territories	16,000		16,000
Nova Scotia	9,500		9,500
Nunavut	15,000		15,000
Ontario - Agriculture, Food and Rural Affairs		50,000	50,000
Ontario - Health and Long Term Care	100,000	10,000	110,000
Ontario - Natural Resources	80,000	42,500	122,500
PEI - Environment	4,735	8,500	13,235
Québec - Ministère des Forêts, de la Faune et des Parcs	135,000	57,892	192,892
Québec - Ministère de l'Agriculture, des Pêcheries et de l'Alimentation	40,000		40,000
Québec - Ministère de la Santé et des Services sociaux	20,000	10,000	30,000
Saskatchewan Agriculture and Food		72,000	72,000
Saskatchewan Environment	41,309		41,309
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		136,204	136,204
TOTAL REVENUE	\$ 1,554,275	\$ 1,031,947	\$ 2,586,222

EXPENSES

	General	Targeted	Total
Salaries and Benefits	1,130,979	624,994	1,755,972
Equipment	25,011	26,206	51,217
Diagnostic Costs	146,119	107,458	253,577
Operations	74,902	8,738	83,640
Travel	13,978	5,569	19,546
Other	25,511	22,777	48,288
Overhead	199,246	107,341	306,586
TOTAL EXPENSES	1,615,744	903,082	2,518,826

REVENUE LESS EXPENSES	\$ (61,469)	\$ 128,865	\$ 67,396
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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.



STAFFING & NETWORK

CWHC NATIONAL OFFICE

Patrick Zimmer - Executive Director
Kevin Brown - Information Services Manager
Marnie Zimmer - Knowledge Mobilization Officer
Bevan Federko - Programmer/Analyst
Jackson Schuler - Programmer/Analyst **Robyn Frank** - Programmer/Analyst
Nataliya Morgun - Accountant
Jordi Segers - National White-Nose Syndrome Coordinator (*Charlottetown*)
Carolyn Blushke - 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

Jamie Rothenburger - Regional Director
Dayna Goldsmith - Regional Director (Acting)

CWHC WESTERN/NORTHERN

Trent Bollinger - Regional Director
Lorraine Bryan - Veterinary Pathologist
Véronique Savoie-Dufour - Veterinary Pathologist
Erin Moffatt - Wildlife Biologist
Katelyn Luff - Wildlife Biologist

CWHC ONTARIO/NUNAVUT

Claire Jardine - Regional Director
Brian Stevens - Veterinary Pathologist
Jane Parmley - Epidemiologist
Lenny Shirose - Biologist
Laura Dougherty - Wildlife Technician
Maria Alexandrou - 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
Tessa McBurney - Atlantic bat conservation project technician
Scott McBurney - Veterinary Pathologist (retired)

26 GRADUATE STUDENTS

Alberta	2
Western/Northern:	3
Ontario/Nunavut:	8
Québec:	3
Atlantic:	10

19 ASSOCIATES / AFFILIATES

National Office:	4
British Columbia:	1
Alberta:	4
Western/Northern:	1
Ontario/Nunavut:	1
Québec:	1
Atlantic:	7

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.





CANADIAN
WILDLIFE HEALTH
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