

# WOAH Collaborative Centre Reports Activities 2023

## Activities in 2023

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### Centre Information

<b>Title of WOA Collaborating Centre</b>	Canadian Wildlife Health Cooperative / National Wildlife Health Center
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<b>Name Director of Institute (Responsible Official):</b>	Patrick Zimmer / C. LeAnn White
<b>Name (including Title and Position) of Head of the Collaborating Centre (WOAH Contact Point):</b>	Patrick Zimmer, National Director / C. LeAnn White, Center Director
<b>Name of the writer:</b>	Patrick Zimmer / Robert Dusek

### TOR1 AND 2: SERVICES PROVIDED

1. Activities as a centre of research, expertise, standardisation and dissemination of techniques within the remit of the mandate given by WOA

Category	Title of activity	Scope
Epidemiology, surveillance, risk assessment, (true)	Disease surveillance: general scanning	Wildlife health monitoring activities by the CWHC include a nationwide surveillance program providing a set of observations and signals that have relevance for conservation, public health and economic development. In 2023 the CWHC examined 5084 animals in our targeted and scanning surveillance programs, from all 13 provinces and territories. In 2023 the CWHC conducted targeted surveillance programs for Rabies and West Nile Virus. 2154 animals were examined for Rabies, 21 were positive via IHC and/or DRIT from multiple jurisdictions in Canada, in particular the provinces of Saskatchewan, Quebec, and Ontario. 6440 wild birds were examined for WNV in Canada (RT-PCR), 136 birds were found positive from multiple jurisdictions. In 2023 the CWHC examined 230 bats for the causative agent of White Nose Syndrome ( <i>P. destructans</i> ). Bats were subjected to necropsy and tested via PCR and culture. 4 of the 230 bats were diagnosed with WNS, including continued westward expansion with <i>P. destructans</i> in Canada. In 2019, the CWHC discontinued its targeted surveillance program in Saskatchewan. However, all cervid

		<p>species submitted to select CWHC regional centres via our scanning surveillance program are tested for CWD. In 2023 246 animals (including Mule Deer, White-tailed deer, Moose and Elk) were tested and 39 cases of CWD have been confirmed in Saskatchewan under this program. All samples are tested via IHC. In addition Chronic Wasting Disease was detected for the first time in the province of British Columbia. In 2023 the CWHC tested 4929 wild birds for avian influenza virus via RT-PCR. 2132 of the birds examined were found to be positive.</p>
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### TOR3: HARMONISATION OF STANDARDS

2. Proposal or development of any procedure that will facilitate harmonisation of international regulations applicable to the main focus area for which you were designated

Proposal title	Scope/Content	Applicable area
USGS National Wildlife Health Centre/CWHC shared wildlife disease case definitions	Shared case definitions for wildlife disease diagnosis.	Wildlife health and biodiversity
Wildlife Health Information Platform by the CWHC	The CWHC National Wildlife Disease database has redeveloped and is capable of tracking incident and event-based data. This new platform supports Canadian wildlife health needs for disease assurance and enhance its competitiveness by augmenting current surveillance systems with new technology and information streams. In collaboration with Agriculture and Agri-Food Canada an Avian Influenza module of the platform was designed in cooperation with poultry industry and government representatives. The platform (Wildlife Health Information Platform – WHIP) became operational in late 2018.	Wildlife health and biodiversity
CAHSN and CEZD	The CWHC are founding members of the Canadian Animal Health Surveillance Network ( <a href="http://www.inspection.gc.ca/animals/terrestrial-animals/diseases/surveillance/eng/1313720601375/1313720675875">http://www.inspection.gc.ca/animals/terrestrial-animals/diseases/surveillance/eng/1313720601375/1313720675875</a> ) and the Community for Emerging and Zoonotic Diseases ( <a href="https://www.cahss.ca/media/uploads/CEZD/documents/17-01-04_17-29/CEZD_Summary_English_.pdf">https://www.cahss.ca/media/uploads/CEZD/documents/17-01-04_17-29/CEZD_Summary_English_.pdf</a> ), sitting on the board of directors and provide strategic advice and surveillance information. These programs link multiple jurisdictions and partners and draws on the disease detection abilities of multiple entities to provide surveillance information on select disease.	Laboratory expertise Wildlife health and biodiversity

3. In exercising your activities, have you identified any regulatory research needs\* relevant for WOA?H?

4. Did your Collaborating Centre maintain a network with other WOA?H Collaborating Centres (CC), Reference Laboratories (RL), or organisations designated for the same specialty, to coordinate scientific and technical studies?

Yes

Name of WOA?H CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
Wildlife Health Australia	Sydney	Asia and Pasific	Wildlife health risk management

### TOR4 AND 5: NETWORKING AND COLLABORATION

5. Did your Collaborating Centre maintain a network with other WOAHC Collaborating Centres, Reference laboratories, or organisations in other disciplines, to coordinate scientific and technical studies?

Yes

Name of WOAHC CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
Chronic Wasting Disease Reference Laboratory (CFIA)	Winnipeg Canada	Americas	The CWHC serves as a tissue and data bank for Chronic Wasting Disease
HPAI reference laboratory (CFIA)	Winnipeg Canada	Americas	The CWHC collaborates with the Winnipeg lab to provide confirmatory testing for Canada's wild bird AIV surveillance program.
Centre of Expertise for Rabies (CFIA)	Ottawa, Canada	Americas	The CWHC provides samples and data to the Rabies Centre in collaboration for Rabies surveillance in Canada

## TOR6: EXPERT CONSULTANTS

6. Did your Collaborating Centre place expert consultants at the disposal of WOAHC?

No

## TOR7: SCIENTIFIC AND TECHNICAL TRAINING

7. Did your Collaborating Centre provide advice/services to requests from Members in your main focus area?

No

8. Did your Collaborating Centre provide scientific and technical training, within the remit of the mandate given by WOAHC, to personnel from WOAHC Members?

No

## TOR8: SCIENTIFIC MEETINGS

9. Did your Collaborating Centre organise or participate in the organisation of scientific meetings related to your main focus area on behalf of WOAHC?

No

## TOR9: DATA AND INFORMATION DISSEMINATION

10. Publication and dissemination of any information within the remit of the mandate given by WOAHC that may be useful to Members of WOAHC

a) Articles published in peer-reviewed journals:

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- Russell S, Coombe M, Zlosnik J, Kuchinski K, McGregor G, Yang K, Tyson J, Bowes V, Redford T, Thacker C, Wildon W, Fraser E, Jassesm A, Prystajecy N, Himsworth CG. Sniffing Out Danger: exploring the spillover potential of highly pathogenic avian influenza virus (H5N1) using genomics in BC's wild skunk population. Washington State One Health Conference, Ellensburg, Washington, August 16, 2023.
- \*Lee L, Himsworth CG, Prystajecy N, Dibernardo A, Albers T, Dhawan R, Henderson K, Mulder G, Atwal H, Beattie I, Byers K. SARS-CoV-2 Surveillance in Wild Mice (*Mus musculus* and *Peromyscus maniculatus*) and Rats (*Rattus norvegicus* and *Rattus rattus*) in North American Cities. 71st Annual International Conference of the Wildlife Disease Association, Athens, July 29 – August 4, 2023.
- \*Lee L, Himsworth CG, Byers K, Atwal H, Gabaldon G, Ritchie G, Lowe C, Matic N, Chorlton S, Hoang L, Leung V. Detection of multiple human enteropathogens in Norway rats (*Rattus norvegicus*) from an under-resourced neighborhood in Vancouver, British Columbia. 71st Annual International Conference of the Wildlife Disease Association, Athens, July 29 – August 4, 2023.
- Dong E\*, Robinson S, Nelson C, Thacker C, Winchester M, Byers K. 2023. A review of Chronic Wasting Disease management strategies. BC One Health and Zoonoses Symposium. Langley, BC. November 29th.
- Byers KA, Yazdani R, Smith J, Murray MH. 2023. Unifying One Health with Social and Environmental Determinants of Health. The Wildlife Society's 30th Annual Conference. Louisville, KY, USA. November 5th – November 10th.
- Byers KA, Dong E, Thacker C, Winchester M, Nelson C. 2023. Human dimensions of Chronic Wasting Disease management: A systematic review. The Wildlife Society's 30th

Annual Conference. Louisville, KY, USA. November 5th – November 10th.

7. Byers KA, Yazdani R, Smith J, Murray MH. 2023. Connected yet disconnected: Exploring how Social and Environmental Determinants of Health are integrated within One Health. *Infectious Disease and Climate Change Forum*. November 8th. Virtual.
8. Byers KA, Yazdani R\*, Smith J, Murray M. 2023. The socio-ecological side of One Health in cities. *International Urban Wildlife Conference*. Washington, DC, USA. June 4 - 7th.
9. Byers KA, Lee MJ, Murray MH, Himsforth CG. 2023. Rat management in the rattiest cities of Canada and America: A One Health approach. *The Wildlife Society BC Chapter & Canadian Section Joint Conference*. Victoria, BC. March 30 – April 1.
10. Sweeny, A, Raverty, S, Zhang, E, Daoust, P-Y, Burek, K, Haman, KH, Wendte, J, Wormin, K, Lambourn, D, Huggins, J, Nielsen, O, St. Leger, J, Hammill, M, Fenton, H, Protozoan Pathogen Discovery Group, Grigg, ME. Protozoan Population Shifts Across Climate Gradients: Arctic/subarctic Interface. *NIH Global Health Interest Group Symposium, Climate Change Session, National Institutes of Health, Bethesda, MD, June 21, 2023*
11. Noren, D, Ylitalo, G, Raverty, S, Robeck, T and Gates, J. Killer whale muscle biochemical indicators of health and body condition. *NOAA One Health Summit, Washington, DC, August 15-16, 2023*
12. Lum, A, Tuttle, A, Martony M, Anderson, R, Anderson, C, Haulena, M, Goertz, C, Raverty, S, Burek-Huntington, K, Thompson, L and Dunn, L. Causes of Morbidity and Mortality in Stellar Sea Lions (*Eumetopias jubatus*) Under Human Care in North America from 1979-2021. *International Association of Aquatic Animal Medicine, 53rd Annual Conference, Salt Lake City, Utah, May 21–24, 2023*• Ampuero F, Leacy A, Pham PH, Che S, Jardine C, Nagy E, Delnatte P, Lillie BN, Susta L. Experimental pathogenesis of aquatic bird bornavirus 1 in Pekin ducks. *Scientific Reports*. 2023 Oct 23;13(1):18094.
- Robinson SJ, Borlang J, Himsforth CG, Pearl DL, Weese JS, Dibernardo A, Osiowy C, Nasheri N, Jardine CM. Rat Hepatitis E Virus in Norway Rats, Ontario, Canada, 2018–2021. *Emerging Infectious Diseases*. 2023 Sep;29(9):1890.
- Schutten K, Chandrashekar A, Bourdages M, Bowes V, Elliott J, Lee S, Redford T, Provencher J, Jardine C, Wilson L. Assessing plastic ingestion in birds of prey from British Columbia, Canada. *Environmental Science and Pollution Research*. 2023 Jul;30(31):76631-9.
- Giacinti JA, Robinson SJ, French SK, Pearl DL, Jardine CM. The influence of sociodemographic and environmental factors on wildlife carcass submissions in urban areas: Opportunities for increasing equitable and representative wildlife health surveillance. *Facets*. 2023 Apr 20;8(1):1-3.
- Robinson SJ, Kotwa JD, Jeeves SP, Himsforth CG, Pearl DL, Weese JS, Lindsay LR, Dibernardo A, Toledo NP, Pickering BS, Goolia M. Surveillance for SARS-CoV-2 in Norway rats (*Rattus norvegicus*) from southern Ontario. *Transboundary and Emerging Diseases*. 2023 May 26;2023.
- French SK, Kotwa JD, Singh B, Greer T, Pearl DL, Elsemore DA, Hanna R, Jardine CM, Weese JS, Mercer N, Peregrine AS. Factors associated with *Giardia* infection in dogs in southern Ontario, Canada. *Veterinary Parasitology: Regional Studies and Reports*. 2023 Jun 1;41:100870.
- Allen SE, Vigil SL, Furukawa-Stoffer T, Colucci N, Ambagala A, Pearl DL, Ruder MG, Jardine CM, Nemeth NM. Abundance and diversity of *Culicoides* Latreille (Diptera: Ceratopogonidae) in southern Ontario, Canada. *Parasites & Vectors*. 2023 Jun 14;16(1):201.
- Ampuero F, Leacy A, Pham PH, Che S, Tuling J, El-Khouary A, Nagy E, Jardine C, Delnatte P, Lillie B, Susta L. Experimental infection of aquatic bird bornavirus 1 (ABBV-1) in Canada geese (*Branta canadensis*). *Veterinary Microbiology*. 2024 Jan 1;288:109946.
- Giacinti JA, Signore AV, Jones ME, Bourque L, Lair S, Jardine C, Stevens B, Bollinger T, Goldsmith D, British Columbia Wildlife AIV Surveillance Program (BC WASP), Pybus M. Avian influenza viruses in wild birds in Canada following incursion of the highly pathogenic H5N1 virus from Eurasia in 2021/2022. *bioRxiv*. 2023:2023-11.
- Robinson EL, Jardine CM, Russell C, Clow KM. Comparing Canadian Lyme disease risk area classification methodologies. *Zoonoses and Public Health*. 2023 Jun;70(4):294-303.
- Jeeves SP, Kotwa JD, Stevens B, Shirose L, Cai HY, Peregrine AS, Mubareka S, Jardine CM. Additional diagnoses of *Echinococcus multilocularis* in eastern chipmunks (*Tamias striatus*) from southern Ontario—results from ongoing surveillance for *E. multilocularis* in intermediate hosts in Ontario, Canada. *Veterinary Parasitology: Regional Studies and Reports*. 2024 Feb 1;48:100982.
- Giacinti JA, Pearl DL, Ojckic D, Bondo K, Jardine CM. CANINE DISTEMPER VIRUS ECOLOGY: INSIGHTS FROM A LONGITUDINAL SEROLOGIC STUDY IN WILD RACCOONS (*PROCYON LOTOR*). *The Journal of Wildlife Diseases*. 2023 Jul 1;59(3):407-19.
- Sinclair D, Stephen C, Parmley EJ, Jones-Bitton A, Poljak Z, Jardine CM. Using communication networks to assess the level of sharing of wildlife health data and information among wildlife professionals in Ontario, Canada. *Human Dimensions of Wildlife*. 2023 Sep 3;28(5):468-80.
- Dillon RM, Paterson JE, Manorome P, Ritchie K, Shirose L, Slavik E, Davy CM. Effects of ophidiomycosis on movement, survival, and reproduction of eastern foxsnakes (*Pantherophis vulpinus*). *Scientific Reports*. 2024 Feb 28;14(1):4948.
- Olson DH, Grant EH, Bletz M, Piovita-Scott J, Lesbarrères D, Kerby JL, Adams MJ, Breitman MF, Christman M, Forzan MJ, Gray MJ.....Shirose L, et al. Preparing for a *Bsal* invasion into North America has improved multi-sector readiness. *Frontiers in Amphibian and Reptile Science*.;2:1347541.
- Alkie TN, Cox S, Embury-Hyatt C, Stevens B, Pople N, Pybus MJ, Xu W, Hisanaga T, Suderman M, Koziuk J, Kruczkiewicz P. Characterization of neurotropic HPAI H5N1 viruses with novel genome constellations and mammalian adaptive mutations in free-living mesocarnivores in Canada. *Emerging microbes & infections*. 2023 Dec 31;12(1):2186608.

b) International conferences:

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1. Segers, J, S McBurney, M Jones, P Zimmer and D Joly. Update on the Canadian National Bat Health Program. (15 minutes) for White-nose Syndrome Annual Workshop, Palm Springs, California, June 9, 2023.
2. Segers, J, S McBurney, M Jones, P Zimmer, and D Joly. Using a Wildlife Health Intelligence Platform for Recovery of Endangered Bat Species in Canada. (15 minutes) for White-nose Syndrome Annual Workshop, Palm Springs, California, June 10, 2023.
3. Avery-Gomm S, T Barychka, M English, R Ronconi, J-F Rail, S Duffy, M Beaumont, C Ward, W Montevecchi, S Lair, M Jones, J Giacinti, C Soos, G McPhail, T Burt, S Collins, A Lang, J Wight, I Rahman, C Sutherland. A comprehensive summary of wild bird mortalities in eastern Canada during the 2022 Highly Pathogenic Avian Influenza Outbreak. 71st International Conference of the Wildlife Disease Association, Poster Presentation, July 29-Aug 4, 2023.
4. Giacinti, J, A Signore, C Erdelyan, M Jones, S Lair, C Jardine, B Stevens, D Goldsmith, C Himsforth, M Pybus, Y Berhane, C Soos. A phylogeographic reconstruction of the spatiotemporal emergence and spread of highly pathogenic H5N1 avian influenza in Canada. 71st International Conference of the Wildlife Disease Association, Oral Presentation, Aug 3, 2023.
5. McRuer, D, K Patriquin, L Phinney and S McBurney. Welfare Recommendations for Canadian Bat Censuses Involving Capture and Handling. (General Poster Presentation) for the 71st Annual International Conference of the Wildlife Disease Association – People, Passion, and Purpose: The Pathway to Wildlife Health, Athens, Georgia, August 2-3, 2023.
6. Daoust, PY. Health surveillance in the Canadian North. Wildlife session, ACVP Annual Meeting, Chicago (invited presentation). Oct 30, 2023.
7. Clark, A, RS Fraser, L Bourque, MEB Jones. Pathologic findings in 11 striped skunks diagnosed with highly pathogenic avian influenza from Prince Edward Island, Canada. American College of Veterinary Pathologists Annual Meeting, Chicago Illinois, USA,

Poster Presentation. Oct 31, 2023.

8. Jolene Giacinti et. al 'A phylogeographic reconstruction of the spatiotemporal emergence and spread of highly pathogenic H5N1 avian influenza in Canada', WDA Oral Presentation and Poster

c) National conferences:

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9. Chételat, J, K Gurney, C McClelland, J Elliott, G Fitzgerald, M Jones, S Lair, S de Solla, F

de Bie, L Bourque, H Fenton, D Goldsmith, J Harms, M Henaff, S Lee, K Magnusson, J McLeod, E Moffatt, K Rae, L Shirose, J Stalwick, M Zimmer. Lead exposure of scavenging birds in Canada due to accidental ingestion of lead ammunition. Canadian Ecotoxicity Workshop, Ottawa, ON, Oral Presentation, Oct 4, 2023.

10. Jones, M. Wildlife health surveillance: why parasites and parasitologists matter (Invited presentation, keynote session: How can we help? How parasitologists can help in government, NGOs, and communities). Atlantic Canada Association of Parasitologists Annual Meeting, Pictou, NS, Oct 20, 2023.

11. Galeuzzi, O, W Robbins, T McBurney, M Buote, M Jones. Ectoparasite survey of the Prince Edward Island little brown myotis (*Myotis lucifugus*). Atlantic Canada Association of Parasitologists Annual Meeting, Pictou, NS, Oral Presentation, Oct 20, 2023.

12. Graham, KF, L Bourque, SJ Greenwood, GA Conboy, MEB Jones. Dude where's my mange? What we don't know about the transmission dynamics of sarcoptic mange in red foxes (*Vulpes vulpes*). Atlantic Canada Association of Parasitologists Annual Meeting, Pictou, NS, Oral Presentation, Oct 20, 2023.

13. Robbins, W, O Galeuzzi, KF Graham, S Greenwood, M Jones, M Buote, G Conboy. *Echinococcus multilocularis* infection in a red fox (*Vulpes vulpes*) on Prince Edward Island. Atlantic Canada Association of Parasitologists Annual Meeting, Pictou, NS, Oral Presentation, Oct 20, 2023.

d) Other (Provide website address or link to appropriate information):

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The CWHC website provides up-to-date reporting on a number of wildlife diseases <http://www.cwhc-rscf.ca>

The CWHC produces quarterly reports highlighting surveillance numbers on a 3 month basis, diagnostic highlights, project features and wildlife health news stories. The reports are available at [http://www.cwhc-rscf.ca/quarterly\\_report.php](http://www.cwhc-rscf.ca/quarterly_report.php). The CWHC Annual Report is available at [http://www.cwhc-rscf.ca/annual\\_reports.php](http://www.cwhc-rscf.ca/annual_reports.php)

11. What have you done in the past year to advance your area of focus, e.g. updated technology?

The CWHC continued development of its Online Wildlife Health Tracker app for iOS and Android and web-tool. The application has been translated into English, French, Cree, Dene and Inuktitut to aid in citizen science, reporting of sick and dead wildlife.

12. Additional comments regarding your report: