Canadian Cooperative Wildlife Health Centre

2007-2008 Annual Report

Sponsored by Federal, Provincial and Territorial Governments, the Canadian Wildlife Federation, Ducks Unlimited Canada and Syngenta Crop Protection

Message from the Chair,

Board of Directors

It is my pleasure to present to you the Annual Report of the Canadian Cooperative Wildlife Health Centre (CCWHC) for the fiscal year 2007-08. This report has been reviewed and approved by the CCWHC's Board of Directors, and gives a clear overview of the CCWHC's many programs and functions.

The central pillar of CCWHC activity is investigation of the causes and significance of wild animal diseases in all parts of Canada. This work brings a broad sweep of medical and biological sciences to bear on health and disease in wild animals and their potential impacts on the health of people and domestic animals. It provides high quality information, both to those who formulate government policies and to the public at large. At the same time, it incorporates students at all levels into its work so that knowledge and understanding of these important health issues are widely shared, and so the next generation of wildlife health professionals are given the experiences they need to take their places in society. Thus, our society's investment in the CCWHC program receives a double return: one of essential information and another of equally essential education.

A few events in 2007-08 are particularly noteworthy. One is the establishment of a CCWHC Regional Centre at the new Faculty of Veterinary Medicine at the University of Calgary. Western and northern Canada now will be served by the coordinated activities of the CCWHC centres in Saskatoon, Calgary and Nanaimo. Another is the designation of the CCWHC by the World Organization of Animal Health (OIE) as a Collaborating Centre for Wildlife Disease Surveillance and Monitoring, Epidemiology and Management. The OIE sets global standards in animal disease surveillance, and this recognition by the OIE is a great credit to the CCWHC and to Canada. It also highlights the importance of the evolving international dimension in CCWHC activity, whereby the CCWHC is assisting developing nations to build their own capacities in wildlife disease surveillance and disease management.

I hope you will find this Annual Report interesting and informative. For more information, please visit the CCWHC's informational website at <www.ccwhc.ca>.

Sincerely,

Charles Rhodes
Dean, Western College of Veterinary Medicine
Chair, CCWHC Board of Directors

About the CCWHC

The Canadian Cooperative Wildlife Health Centre (CCWHC) is a university-based, inter-agency partnership through which Canada's Colleges of Veterinary Medicine, government agencies at all levels and non-government agencies pool their resources and expertise to reduce the economic and ecological costs and impacts of wild animal diseases in Canada

Partners

The CCWHC partnership was established in 1992 with leadership from Environment Canada and the Canadian Wildlife Directors, and with additional financial assistance from the Max Bell Foundation.

In 2007-2008, the CCWHC partnership included four Government of Canada agencies: Environment Canada, the Public Health Agency of Canada, Parks Canada, and the Canadian Food Inspection Agency. The partnership also included all provincial and territorial governments, representing Fish & Wildlife, Environment, Agriculture and Health. Additional partners were: the University of Saskatchewan, the University of Guelph, the University of Montreal, the University of Prince Edward Island, and the University of Calgary, and the Centre for Coastal Health, as well as Ducks Unlimited Canada, the Canadian Wildlife Federation and Syngenta Crop Protection.

Locations

The CCWHC has four long-standing university locations, each serving a large region of Canada. These include the Atlantic Regional Centre at the University of Prince Edward Island, the Quebec Regional Centre at the University of Montreal, the Ontario and Nunavut Regional Centre at the University of Guelph, and the Western and Northern Regional Centre at the University of Saskatchewan, which also hosts the CCWHC Headquarters office.

West coast activities are carried out through the Centre for Coastal Health (CCH) in Nanaimo, BC. The 2007-2008 fiscal year saw the continued expansion of CCWHC activities delivered through the CCH. A Regional Centre of the CCWHC is being established at the new Faculty of Veterinary Medicine at the University of Calgary. In 2007-2008, most elements of the CCWHC core program for Alberta were provided by the Western and Northern Regional Centre. As the Calgary Centre develops, each of the three Centres in western Canada will collaborate in delivering the CCWHC program in the region

What We Do

The CCWHC has four separate business lines, each carried out on regional and national scales. The first three business lines are supported by annual contributions from CCWHC partner agencies and the universities, and constitute the CCWHC's core program. The fourth business line—Wildlife Disease Response and Management—is supported by separate funding arrangements for each project and program.


Photo credit: UQROP

Disease Surveillance

Disease surveillance integrates four separate activities into a cohesive program: 1) Detection of diseases, 2) Identification of diseases (diagnosis), 3) Disease information management and 4) Communication. Disease detection is achieved through engagement and support of wildlife personnel across the country. Disease identification is achieved through medical examination of specimens in fully-equipped veterinary diagnostic laboratories, primarily by CCWHC professional staff at the veterinary colleges but also elsewhere through collaboration with government laboratories. Disease information management is done through the CCWHC Information Technology Centre, which includes a national database for all surveillance data. Communication is achieved through a range of instruments: regular reports to the CCWHC Board of Directors and the Canadian Wildlife Directors Committee, web site, newsletter and special program reports.

Information Services

CCWHC personnel respond to requests from partner agency staff for information, advice, representation on committees, participation at meetings, review of documents, scientific planning and other matters related to wild animal diseases and their interactions with public health, agriculture and wildlife conservation. The CCWHC also responds to inquiries from the public and the news media.

Education

The CCWHC furnishes educational programs to its agency partners and to its host universities. Agency personnel are offered presentations and workshops on a range of topics related to wild animal health and disease. CCWHC staff participate in courses offered to undergraduate and post-graduate students at its host universities. The CCWHC also furnishes teaching material, research projects and graduate student supervision to each university. Special courses in wild animal health and disease are offered to veterinary students at each of the veterinary colleges.

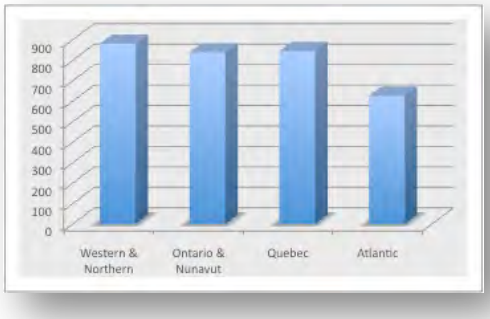
Wildlife Disease Management

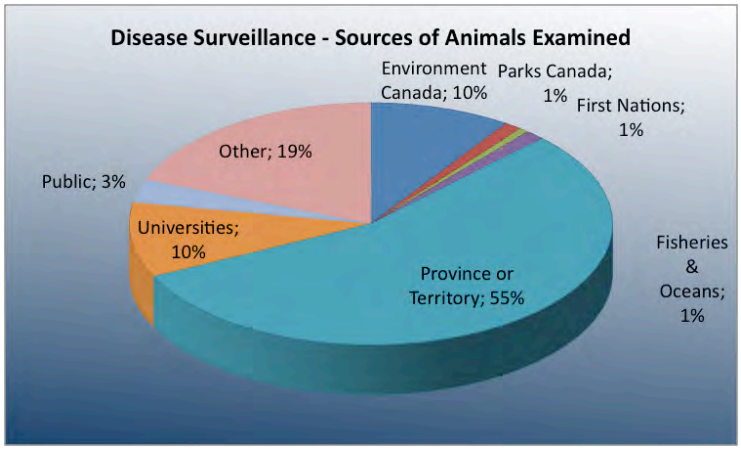
Disease surveillance regularly identifies disease issues requiring more extensive assessment, research or management responses. Targeted special programs to pursue these health issues have become an ever larger proportion of total CCWHC activity, as disease surveillance has accumulated information and as wildlife disease issues of socioeconomic importance have multiplied.

Wildlife Disease Surveillance

Disease surveillance is the foundation for all aspects of Canada's national wildlife disease program. It includes the detection and identification of diseases and their causes, central recording of information in a national database, information analysis, and communication of findings to managers and other stakeholders.

2007-2008 Core Diagnostic Submissions by CCWHC Region





Program Summary

Submissions to the core diagnostic program again increased in 2007-2008, with almost 3,200 specimens examined, an increase of 20% from the previous year. The majority of submissions were derived from municipal, provincial and territorial governments, together representing almost 75% of submissions. Bird species comprised 74% of specimens, with mammalian species representing 23%; the remaining 3% of submissions were made up of amphibians, reptiles and fish species.

The raccoon rabies virus variant was first detected in Quebec in 2006. The high density of raccoons in urban areas increases the risk of transmission of this highly fatal virus to both humans and domestic animals

Raccoon Rabies in Quebec

In conjunction with the government of Quebec and the Canadian Food Inspection Agency, the CCWHC is involved in a surveillance program designed to detect and monitor the spread of the raccoon rabies virus variant in the province of Quebec.

Several rabid raccoons and striped skunks were detected in 2007 as a result of this program. These incidents occurred in *Montérégie* in the *Municipalités régionales de comté* of *Brome Missisquoi* and *Haut Richelieu*, just South-East of the Montreal metropolitan area.

Results of this surveillance programme have helped to target areas for control measures such as rabies vector density reductions and vaccination programs involving wild raccoons. In addition, public prevention campaigns can be directed toward regions where this zoonosis is most prevalent.

Information Services

The CCWHC responded to a wide range of requests for information and advice from partner agencies in 2007-2008. These included participation in regional, national and international meetings, participation on committees, and reports on specific issues. The CCWHC also provided information to the public by responding directly to inquiries, publishing a semi-annual Newsletter, providing numerous media interviews, and maintaining an informational website: *http://wildlife.usask.ca*

Regional Examples

Maritime Marine Animal Assistance Network
Expert witness for the Crown – Wildlife Related Litigation
Parks Canada Eastern Animal Care Task Force
Nova Scotia Mainland Moose Recovery Team
West Nile Surveillance Regional Committees
Provincial Rabies Advisory Committees
Southern Ontario Bald Eagle Recovery Team
Veterinary expertise for the "Réseau québécois d'urgence pour les mammifères marins"
Veterinary expertise for the "Groupe conjoint de travail sur la gestion de l'Eider à duvet"
Regional/Provincial Chronic Wasting Disease Surveillance and Research Planning Committees
Veterinary expertise for the intervention plan for oiled birds - rehabilitation action plan
Provincial committee for the surveillance of Viral Hemorragic Septicemia virus
Provincial/Territorial Avian Influenza Advisory Committees
Northwest Territories Wildlife Care Committee

National Examples

National Animal Health Science Workshop
Lyme Borreliosis Consultation Committee (PHAC)
Canadian Reptile and Amphibian Conservation Network
National Steering Committee on West Nile Virus (PHAC)
National Non-enteric Zoonotic Diseases Committee Issue Group (PHAC)
Arctic and Northern Non-enteric Zoonotic Diseases Sub-issue Group (PHAC)
West Nile Virus and other Vector-borne Diseases Sub-issue Group (PHAC)
Canadian Rabies Committee Sub-issue Group (PHAC)
Canadian Zoonotic Influenza Sub-issue Group (PHAC)
Viral Haemorrhagic Septicemia Virus Symposium.
Aquaculture Association of Canada
Canadian Animal Health Laboratories Network
National Animal Health Strategy (CFIA)
Avian Influenza Advisory Committee (CFIA)
Canadian Animal Health Surveillance Network
Harvested Wildlife: A Safety Guide Concerning Animal Disease and Parasites
Steering Committee: Canada's Inter-agency Wild Bird Survey
Executive Committee: Canada's Inter-agency Wild Bird Influenza Survey
Data Management and Communication in Canada for the International Polar Year
Animal capture drug advice, acquisition and distribution to wildlife agency personnel
Canadian Wildlife Directors Committee - Health Canada Veterinary Drug Working Group
Animal Determinants of Emerging Disease (ADED): National Zoonoses Rounds

International Examples

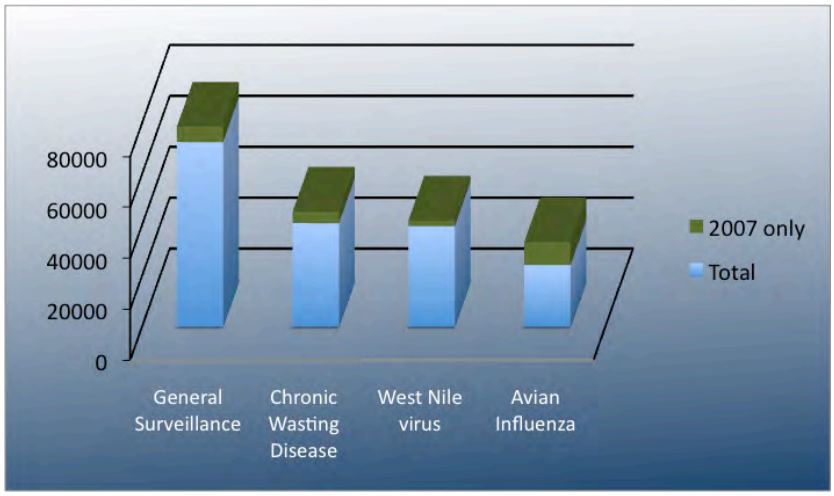
Working Group on "Animal welfare aspects of the killing and skinning of seals". European Food Safety Authority.
Wildlife Disease Association Annual Conference, Chronic Wasting Disease Workshop
Australian Society for Veterinary Pathology
World Association of Veterinary Laboratory Diagnosticians
32nd Eastern Fish Health Workshop
OIE Collaborating Centre on Wildlife Disease Surveillance and Monitoring, Epidemiology and Management
OIE Permanent Working Group on Wildlife Diseases
OIE ad hoc Group in Climate Change and Surveillance for Vector-borne Diseases
OIE ad hoc Group on Wildlife Disease Surveillance
Canada-USA-Mexico Tri-lateral Committee on Surveillance for Avian Influenza in Wild Birds
Wildlife Disease Informatics Working Group
CircumArctic Rangifer Monitoring and Assessment Network
WCS-FAO Avian Influenza Database Meeting

Information Technology Centre

THE CCWHC Information Technology (IT) Centre provides on-going support and service to the entire CCWHC, primarily in the areas of database and application development. 2007 saw a significant shift in focus from an older system to a new more flexible database. This database is being used by all CCWHC sites as well as by some partner agencies and individual researchers. CCWHC holds almost 177,000 records of wildlife disease occurrences in its database systems, a number which should grow to in excess of 200,000 in 2008. The Centre also provides on-going support, training and advisory services to the CCWHC at large and is engaged in several national and international initiatives to promote the sharing and use of wildlife disease data.

CCWHC Website
http://wildlife.usask.ca

National Wildlife Disease Database Recorded Incidents



In 2007-2008, a total of 22,026 wildlife disease incidents were recorded within the CCWHC National Wildlife Disease Database. Incidents were primarily linked with 4 programs: General Wildlife Disease Surveillance and special surveillance programs for Chronic Wasting Disease, West Nile Virus and Avian Influenza. The 177,000 disease incident records in the CCWHC database represent the efforts of CCWHC personnel, participating university and government laboratories, government and other field personnel, and the general public.

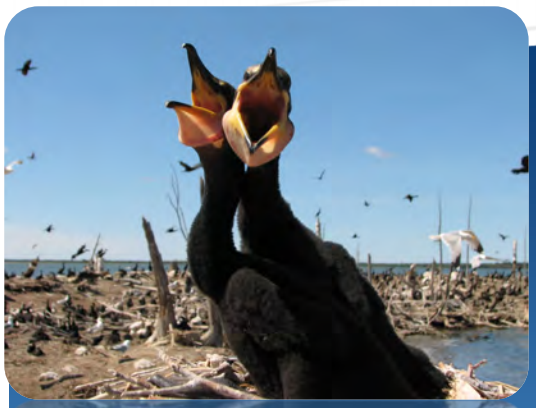


Photo credit: Josanne Verhagen

Epidemic Diseases in Double-crested Cormorants

A long-term study of epidemic diseases on one very large colony of Double-crested Cormorants in the southern boreal forest of Saskatchewan has been carried out by the Western and Northern Regional Centre of the CCWHC since 1994. The colony has varied in size from 11,000 to 4,000 nesting pairs during the study, with an average of 7,300 nesting pairs. Large-scale epidemic mortality, which killed 30-60% of fledglings, occurred in late summer on the colony in 10 of the 15 years of this study, with the frequency of epidemics increasing with time. Two very different diseases have been responsible for these epidemics: Newcastle Disease, a viral disease important to poultry, and Avian Cholera, a bacterial disease which affects many different wild bird species. Monitoring continues in order to learn what effect such high annual mortality may have on the colony in the long term.

Education

Education is a key activity for the CCWHC. Education supports disease surveillance through instruction and engagement of wildlife field personnel and the public, and creates wildlife health specialists through university programs. Instruction in a wide range of topics related to wild animal health and disease was provided to community groups and to partner agency personnel in 2007-2008.

Collaborative Training Programs

Training of future wildlife disease experts within its host Universities is an important function of the CCWHC. One of the strengths of the CCWHC is its capacity to foster collaboration between its different regional centers. In 2007, the University of Montreal (Quebec Regional Centre) and the University of Calgary (Alberta Regional Centre) started a collaborative research and training project on the ecology of Besnoitiosis, a significant parasitic disease in caribou. Julie Ducrocq, a graduate student co-supervised by Stéphane Lair (Quebec) and Susan Kutz (Alberta) is carrying out this project as part of the CircumArctic *Rangifer* Monitoring and Assessment Network. In addition to providing graduate training for a veterinarian in the field of wildlife diseases, this project facilitates the sharing of expertise between the Quebec and Alberta regional centers.

Dogs, Wildlife & Human Health

For several years, Dr. Susan Kutz (CCWHC - University of Calgary Faculty of Veterinary Medicine) and Alasdair Veitch, (Supervisor, Wildlife Management, Sahtu Region, Government of the NWT) have coordinated a monitoring program for wild animal health carried out by the communities of the Sahtu Region of the North West Territories (NWT) (http://wildlife1.usask.ca/Sahtu/). As part of this program, Drs Kutz, and Veitch, wildlife specialists from the Government of the NWT, and graduate students from Saskatoon and Calgary have made annual winter visits to each community in the region since 2003 to work with community participants and to provide an outreach program in schools on aspects of wildlife biology and health. In January 2008, the tour theme was "dog health and welfare". It is widely perceived in many parts of Canada that dogs in remote northern communities constitute a problem for those communities. Issues such as too many dogs, dog bites and dog attacks, unhealthy condition of dogs and risks to people of diseases, such as rabies from dogs, are widely cited. But do these views match the actual experience of the people who live in remote northern communities? To begin to answer this question, the CCWHC and its associates in the Sahtu Region, Government of the NWT and Veterinarians Without Borders Canada recruited graduate student Dr. Caroline Millins to carry out a preliminary assessment of this issue in the Sahtu Region. To evaluate general dog health as well as knowledge, behaviours and attitudes of community members towards dogs, a series of one-day veterinary clinics were held in each community and questionnaires about dogs were filled out by school children and people who brought their dogs to the clinics. Interactive presentations on dog health, dog bite prevention, and relationships among dogs, human health and wildlife health were given at the schools and senior students were recruited to gain work experience assisting with the veterinary clinics. The results of this preliminary assessment are being compiled into a comprehensive report.

Education Summary

In 2007-2008 CCWHC staff supervised 24 graduate students, provided over 400 hours of instruction to University undergraduates and 120 hours of instruction to partner agencies, and made over 30 scientific presentations.

Education (continued)

A CCWHC Regional Centre in Alberta

A new Centre of the CCWHC has been established at the University of Calgary Faculty of Veterinary Medicine (UCVM). Planning and development of this Centre began soon after UCVM was created. The CCWHC is an excellent fit with UCVM's program, given that Ecosystem and Public health is one of four Areas of Emphasis within the curriculum. Dr. Susan Kutz, wildlife parasitologist and a founding faculty member, is the coordinator of the CCWHC at UCVM. More than 35 faculty members, 30 graduate students, and many administrative and technical support staff are in place. Curriculum development is well underway in anticipation of the first class of 30 DVM students beginning in September 2008. Staff and activities of the CCWHC Centre are developing in parallel. A pathology laboratory and wildlife research area are under construction at the Clinical Skills Building and Complex located at Spy Hill. Faculty positions in wildlife health ecology, public health, toxicology and related fields are currently in the interview process and soon will be filled. A close partnership with the Centre for Coastal Health in BC through Associate Professor and CCH Direcotr Dr. Craig Stephen is focusing on ecosystem and public health initiatives. In the near future, the four western provinces, the Yukon and the Northwest Territories will benefit from the coordinated services and activities of three CCWHC Centres, at Calgary, Saskatoon, and Nanaimo. In recognition and celebration of our new Centre, the CCWHC held its annual national meeting at UCVM in February 2008, preceded by a very successful wildlife health and disease workshop held at the Calgary Zoo. (see page 10).

Community Engagement

In 2007, the Makivik Corporation of northern Quebec invited the CCWHC to be a partner in an application to Canada's International Polar Year Office for a project which would build capacity in northern communities to test locally-acquired country foods for certain disease-causing agents of concern and to build additional local capacity for the longer-term monitoring of food safety and wildlife health. This application was successful, and the CCWHC will be working with the Principal Investigator, Manon Simard of Makivik Corp, and several other scientists and institutions, to carry out this innovative program over the next several years. The disease-causing agents of immediate concern are three food-borne parasites, *Toxoplasma, Trichinella* and fish-dwelling nematodes of the family *Anasakidae,* and bacteria, *E. coli* type O157:H7 and *Salmonella sp* . The major objectives of the program are to empower communities to test their own food and communicate the results locally, and to carry out general surveillance of wildlife health and disease. Communication links also will be formed with Canada-wide programs so that community programs can contribute to national programs of public health and disease surveillance. The main contribution by the CCWHC is expertise in information management and diagnosis of wildlife diseases.

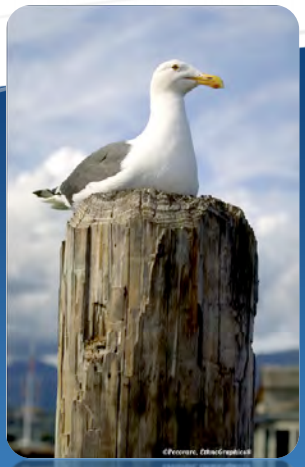
National Workshop on Wildlife Disease Management

On February 21-22 2008, the CCWHC hosted a two-day workshop for wildlife health professionals entitled Wildlife Health Management in Canada: Current Programs and Future Directions. The purpose of the workshop was to gather together a fully representative group of the people most actively engaged in the science and policies of wildlife health and disease management in Canada. This group would first describe their programs and experiences, to create a snapshot of the current state of wildlife health and disease management, identify the strengths and weakness of this current condition, and recommend ways in which components of national and regional programs could be improved.

The workshop was held at wonderful facilities made available to the CCWHC by the Calgary Zoo, and attracted 66 participants from across Canada as well as some guests from the United States. On Day One, short presentations about wildlife health and disease programs were made by all six units of the CCWHC, the Calgary Zoo, Yukon, British Columbia, Northwest Territories, Alberta, Saskatchewan, Manitoba, Nunavut, Ontario, Quebec, Newfoundland and Labrador, Canadian Food Inspection Agency, Public Health Agency of Canada, Fisheries and Oceans Canada, Parks Canada Agency, Canadian Wildlife Federation, Alaska, US National Wildlife Health Centre and Wildlife Conservation Society. These presentations indeed created a unique overview of the rapidly growing and changing state of wildlife health and disease management. This session also provided a powerful opportunity for inter-professional networking, communication, and collaboration.

Day Two was dedicated to critical analysis of Canada's wildlife health programs. The six goals of Canada's National Wildlife Disease Strategy (NWDS) were used as the themes for this analysis: 1) Prevention of new disease issues; 2) Early detection of potential disease problems, 3) Rapid responses to disease issues, 4) Effective disease management capacity, 5) Education and training of personnel and 6) Communication to achieve all aspects of a national wildlife health and disease program. Small discussion groups considered the degree to which these six goals are being achieved in eastern or western Canada, or at the national or the international level. The outcomes of these analyses were presented, and issues and themes of highest priority were further discussed at a final plenary session.

A report on this workshop will be published and distributed by the CCWHC in June 2008. There has been marked growth in Canada's social investment in wildlife health management in the past decade, consistent with the growing socioeconomic and public health importance of these issues. The workshop highlighted Canada's pressing need to implement its National Wildlife Disease Strategy. Participants found the workshop to have been highly beneficial at many different levels. The CCWHC was urged to continue to provide this kind of forum for information exchange and continuing education for wildlife health professionals, and to provide leadership in carrying forward the many action items for national and regional program improvements identified during the workshop.



Type E botulism was confirmed in 8 species of birds: Red Necked Grebe, Horned Grebe, Common Loon, White Winged Scoter, Long Tailed Duck, Red Breasted Merganser, Herring Gull and Bonaparte's Gull

Type E Botulism in the Great Lakes

In the late summer and fall of 2007, the CCWHC Ontario/Nunavut regional centre received reports of several mortality events involving water and shore birds in Lakes Ontario and Huron. Upon examination, Type E botulism was confirmed.

Although samples were not received for confirmation in all cases, other species of birds that were involved in these events included Double Crested Cormorants, Ring Billed Gulls and Great Black Backed Gulls.

While the range of species and timing of events is similar to those of previous years, the most significant change from previous years is the geographic extension of the disease in 2007 around the Bruce Peninsula and into the waters of Georgian Bay.

Disease Response and Management

In 2007-2008, the CCWHC responded to several important wildlife disease issues with targeted programs of enhanced surveillance, research and participation in the disease management actions of partner agencies. CCWHC personnel also participated in research to extend the knowledge of wildlife health and welfare in Canada. Many of these targeted programs also enhance the capacity of the CCWHC core program (business lines 1-3).

Disease Response and Management activities in 2007-2008 were centered around Avian Influenza surveillance in wild birds, West Nile Virus surveillance and research projects, as well as Chronic Wasting Disease surveillance and research. The CCWHC also was involved in wildlife health research within the Foothills Research Institute Grizzly Bear Program, surveillance and monitoring of fish pathogens and in several International Polar Year projects.

Examples of Response and Management Activities in 2007-2008

National Animal Health Strategy
Devils Lake Pathogen Monitoring
West Nile Virus Surveillance
Chronic Wasting Disease Surveillance in Saskatchewan
Animal Health Surveillance for Early Detection of Emerging Infectious Disease Risks
Wild Bison Anthrax Data Collation Project
Canada's Inter-agency Wild Bird Survey
Whole Genome Sequencing of Avian Influenza Viruses (CFIA-NIAID Collaboration)
WCS-FAO Avian Influenza Data Sharing Project
Risks to British Columbia from Chronic Wasting Disease
Engaging Communities in Monitoring Zoonoses, Food Safety and Wildlife Health
Epidemic Diseases in Double-crested Cormorants
PrioNet Canada: Research Management Committee
Prionet Canada: Theme Leader for Chronic Wasting Disease
Prionet Canada: CWD Tissue Bank
West Nile Virus Infection in House Sparrows in Rural Saskatchewan
Relationships Between Environmental Change and Wildlife Population Performance
Biomarkers of Long-term Stress in Wildlife
Health Assessment of Beluga Whales from the St. Lawrence Estuary
Raccoon Rabies Surveillance
Community-based Collections of Arctic Barren-ground Caribou (Rangifer tarandus) in Northern Quebec - 2007 to 2009
Bacteriological Analysis for Avian Cholera (Pasteurella multocida)
CircumArctic Rangifer Monitoring and Assessment Network
The Suitability of Dried Blood on Filter Paper for the Detection of Trypanosoma sp. in Northern Caribou and Reindeer
Invasive Alien Species Partnership Program (IASPP – Environment Canada)
Exposure Levels for Pesticides in Birds of Prey

Avian Influenza Virus

2007 marked the third year of Canada's Inter-agency Wild Bird Influenza Survey, coordinated by the CCWHC and involving a multitude of Universities, Federal, Provincial and Territorial governments and the United States Department of Agriculture. The primary objectives for the 2007 survey were to 1) maintain a high level of vigilance for early detection of highly pathogenic strains of avian influenza virus, and 2) to expand surveillance of healthy live wild ducks in southern regions of Canada. Examination of wild birds found dead was a key component of the program. Birds found dead in all parts of Canada were submitted to a diagnostic laboratory where they were tested for the presence of avian influenza viruses and underwent a full post mortem examination to determine cause of death.

In total, 10,960 samples were collected in 2007 (7,649 from live birds and 3,311 from dead birds); 10,308 samples were tested and 1,390 contained Avian Influenza virus representing 13.5% of tested samples. As in past years, all Avian Influenza strains found were nonpathogenic North American strains.

Response and Management (continued)

Animal Welfare

The welfare of wild animals is affected by many different human activities. Just as animal welfare issues are at the forefront of societal concerns about livestock and other domestic animals, issues regarding animal welfare can and do arise in wildlife harvest, wildlife management, and wildlife research. The CCWHC accepts that animal welfare must be considered in all of its planning and operations. In addition, the CCWHC has undertaken projects aimed specifically at evaluating wild animal welfare issues and in promoting wildlife management practices that minimize animal suffering and long-term consequences.

Animal Capture and Handling

Wildlife management and research often includes the capture and handling of wild animals which subsequently are released back into the wild. The CCWHC is a leader in Canada in developing and teaching best welfare-related practices in wild animal capture, particularly with respect to chemical immobilization and associated medical management and release. The CCWHC has been particularly concerned to evaluate the long-term effects of such procedures on the released animals. New insights have come from work done as part of the Foothills Research Institute Grizzly Bear Program, in which many animals have been fitted with GIS location transmitters and closely monitored after release. The results have identified previously unrecognized animal welfare issues associated with animal capture and handling. Now, researchers are turning their attention to ways in which research can be conducted on such large mammals while minimizing its impact on their health and welfare.

Seal Hunt

The hunting of Harp Seals on the spring pack ice in the Gulf of St. Lawrence and off the Atlantic coasts of Newfoundland and Labrador has been, and remains, a focus of intense debate and differing opinions with respect to animal welfare. Since 1999, CCWHC staff have been among veterinarians asked by various organizations, such as the Canadian Veterinary Medical Association, Fisheries and Oceans Canada, and the Fur Institute of Canada, to observe the hunt in an objective manner in order to determine the degree of occurrence of poor animal welfare practices and provide recommendations for improving such practices, based on current knowledge and on special studies of seal anatomy, physiology and pathology. A number of reports have been written, both independently and in cooperation with scientists from the United States, Europe and South Africa. These reports strive to present an objective picture of hunting methods used, in theory and in practice, and make recommendations to improve animal welfare in the context of this hunt. In 2004, the North Atlantic Marine Mammal Commission organized a workshop in Copenhagen, Denmark, on methods used to hunt seals and walrus, and an international working group on best hunting practices currently is being formed under the Commission, with a first meeting tentatively planned for September 2008 in Greenland.

Chronic Wasting Disease

Beginning in 1997, the Saskatchewan Ministry of Environment (MOE) and the Canadian Cooperative Wildlife Health Centre (CCWHC) started a Chronic Wasting Disease (CWD) surveillance program for wild deer, elk and moose in Saskatchewan. Since that time, over 34,000 animals have been tested for CWD, with 197 testing positive. In 2007-2008, a total of 4,396 animals were tested, with 45 testing positive, including 31 Mule Deer, 13 White-tailed Deer, and 1 unidentifiable deer. In addition, during the winter of 2008, two elk found dead in east-central Saskatchewan tested positive for CWD, marking the first time CWD has been found in wild elk in Canada.

In conjunction with surveillance for CWD among wild deer, the CCWHC also is involved in a number of research initiatives designed to create new and more effective methods to control CWD in wildlife. In 2005, the CCWHC helped create PrioNet Canada, a new Network Centre of Excellence for research on prion diseases. CCWHC now leads the CWD Theme in PrioNet Canada, with ongoing studies designed to increase understanding of key features of CWD-transmission on the Canadian prairies.

Publications and Reports: Technical Reports Produced by CCWHC Staff

Stephen C, Dawson-Coates J, DiCicco E. 2007. Pathogen Risks Associated with the Diversion of Water from Devil's Lake into the Red River Drainage. Report to the International Joint Commission

Ducrocq J, Dawson-Coates J, **Parmley J, Stephen C**. 2007. A systematic review of Michigan's policy for CWD prevention, detection and control. Prepared for the Michigan Department of Natural Resources.

Ducrocq J, Tataryn J, Dawson-Coates J, **Parmley J,** McClaws M, Stephen C. 2007. 2007 Cervid Industry Market Access Report: Chronic Wasting Disease Risks Associated with the Export of Velvet from Canadian Cervids. Report to the Canadian Cervid Association.

Parmley, Ducrocq, **Stephen**. 2007. An assessment of the risk of introducing the organism associated with Johne's Disease (*Mycobacterium avium paratuberculosis*) to new areas in Alaska as a result of translocating wood bison (*Bison bison athabascae*) from Elk Island National Park. Prepared for the Wood Bison Recovery Team

Lumsden JS, S. Russell. (2007). Lake Winnipeg assessment of fish health. Report for the Red River International Joint Commission. 150pgs

Massey, C., and I.K. Barker. 2007. "West Nile Virus Wild Bird Surveillance - Ontario, 2007". Report to Ontario Ministry of Health & Long-term Care on Canadian Cooperative Wildlife Health Centre surveillance for West Nile Virus in Ontario, 2007. 22 pp.

Morton, D (Chairman), AK Ersbøll (Risk Assessor), T Nunes Pina (Risk Assessor), B Algers, I Boyd, **P-Y Daoust**, J Hartung, B Lambooij, DM Lavigne, M Raj, G Stenson, S Kirkman, (E Øen) (Working Group members). 2007. Scientific Opinion of the Panel on Animal Health and Welfare on a request from the Commission on the Animal Welfare aspects of the killing and skinning of seals. The EFSA Journal 610: 1-123. (http://www.efsa.europa.eu/EFSA/efsa_locale-1178620753812_1178671319178.htm)

Doggett, C (coordinating author) and Nova Scotia Mainland Moose Recovery Team. Recovery Plan for Moose (Alces alces Americana) in Mainland Nova Scotia. Nova Scotia Department of Natural Resources, March 2007.

Avian Cholera in Open Ocean Seabirds of Atlantic Canada

During the Winter and Spring of 2007, unusual mortality events were observed in the North Atlantic off the coasts of Labrador, Newfoundland and Nova Scotia involving pelagic or open ocean sea birds. Following a collaborative investigation involving the Newfoundland and Labrador Department of Natural Resources, the Nova Scotia Department of Natural Resources and the CCWHC, it was discovered that these birds had died of Avian Cholera (infection with the bacterium *Pasteurella multocida*). Large scale mortalities associated with this disease in North American seabird populations, particularly those inhabiting an open ocean ecosystem, are thought to be highly unusual and not previously reported.

In order to better understand the means of transmission and the maintenance and ecology of Avian Cholera among pelagic seabirds, a further collaborative investigation including Environment Canada and the United States Geological Survey (National Wildlife Health Centre) is currently underway which includes the DNA typing of bacteria from the different outbreaks. This study will explore the link, if any, between the Northern Atlantic outbreaks and outbreaks in northern Quebec and Nunavut involving Common Eiders as well as European outbreaks around Denmark and in the Baltic sea.

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Whiteside, D.P., **I.K. Barker**, A. Tesoro, P.D. Conlon, K.G. Mehren, R.M. Jacobs, J. Theissen, and M. Spino. 2007. Pharmacokinetic disposition of the oral iron chelator deferiprone in the domestic pigeon (*Columba livia*). Avian Medicine and Surgery 21: 121-129.

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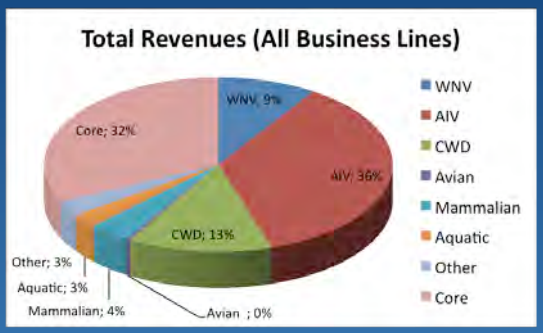
Canadian Cooperative Wildlife Health Centre	Statement of Revenues & Expenses			
				2007/2008
REVENUES	**Core (General)**	**Special Projects**	**Endowment**	**Total Revenues**
Environment Canada	399,240	104,357		**503,597**
Public Health Agency of Canada	240,000	629,125		**869,125**
Parks Canada	130,000	9,849		**139,849**
Canadian Food Inspection Agency	100,000	1,204,839		**1,304,839**
Canadian Institutes of Health Research		105,000		**105,000**
First Nations and Inuit Health	4,700			**4,700**
Fisheries and Oceans		30,000		**30,000**
PrioNet Canada		378,745		**378,745**
Alberta				
Sustainable Resource Development	7,000			**7,000**
Tourism, Parks, Recreation and Culture	4,000			**4,000**
British Columbia	30,000			**30,000**
Manitoba	10,000			**10,000**
New Brunswick				
Health	10,259	3,617		**13,876**
Agriculture and Aquaculture	9,344	3,617		**12,961**
Natural Resources	10,259	3,617		**13,876**
Newfoundland & Labrador	21,711	8,050		**29,761**
Northwest Territories	16,000			**16,000**
Nova Scotia				
Natural Resources	8,000			**8,000**
Agriculture	8,000	4,667		**12,667**
Health	7,000	4,667		**11,667**
Nunavut	11,384			**11,384**
Ontario				
Agriculture, Food and Rural Affairs		50,000		**50,000**
Natural Resources	80,000			**80,000**
Health and Long Term Care	82,500	74,391		**156,891**
Prince Edward Island	4,735	1,050		**5,785**
Quebec	104,500	18,773		**123,273**
Saskatchewan				
Health		19,895		**19,895**
Environment	41,309	240,000		**281,309**
Agriculture		38,815		**38,815**
Yukon	10,000			**10,000**
Ducks Unlimited	12,000			**12,000**
Syngenta	3,000			**3,000**
Canadian Wildlife Federation	10,000			**10,000**
Universities	106,000			**106,000**
United States Department of Agriculutre		92,449		**92,449**
Alberta Innovation and Science		74,370		**74,370**
NSERC-CRD		35,319		**35,319**
Saskatoon Community Foundation			202	**202**
Miscellaneous Income				**0**
TOTAL REVENUE	**1,480,941**	**3,135,212**	**202**	**4,616,355**
				2006/2007
EXPENSES				**Total Expenditures**
Salaries and Benefits	782,938	1,122,447		**1,905,385**
Equipment	61,379	152,960		**214,339**
Diagnostic Costs	201,053	800,330		**1,001,383**
Operations	58,564	199,117		**257,681**
Travel	79,404	68,537		**147,941**
Other	58,784	269,998		**328,782**
Overhead	188,660	457,586		**646,246**
TOTAL EXPENSES	**1,430,782**	**3,070,976**	**0**	**4,501,758**
Revenue less Expenditures	50,159	64,237	202	114,598

Financial Highlights

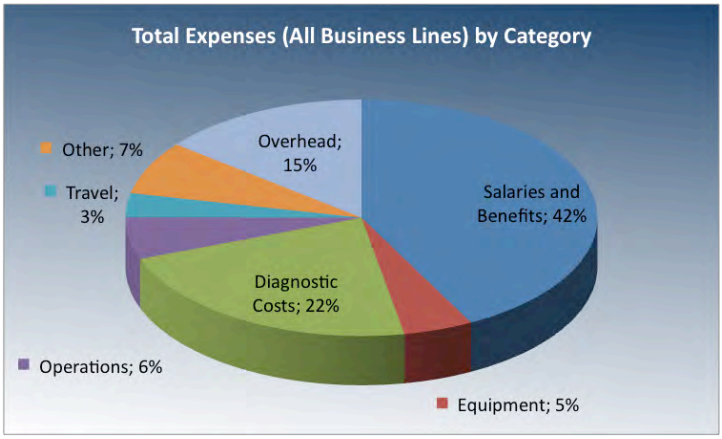
For 2007-2008, the CCWHC had total revenues of $4,616,355, a decrease of 2% from 2007-2008. Core Program revenues comprised $1,480,941 or 32% of the total, comparable to funding levels in 2006-2007 (business lines 1-3). Revenues from Response and Management activities, mostly from targeted research programs (business line 4) comprised $3,135,212 or 68% of total revenue.

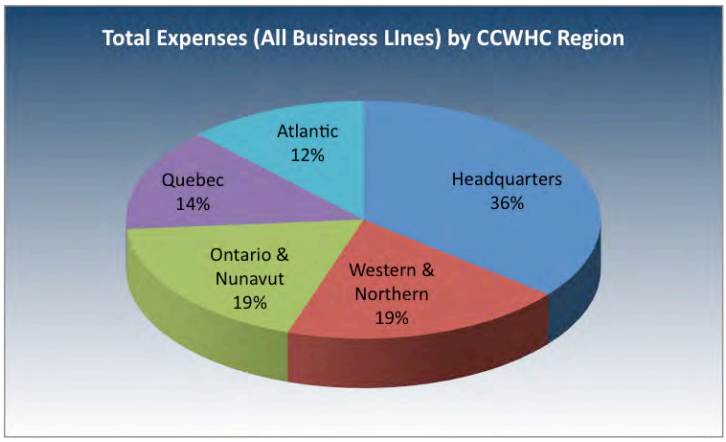
Core Program revenue (business lines 1-3) from the Government of Canada accounted for $873,940 or 59% of the total, while core revenue from the provinces and territories accounted for $476,001 or 32%. University contributions (beyond in-kind) accounted for $106,000 or 7%, while contributions from other non-government organizations and individuals accounted for the remaining $25,000 or 2%.

Response and Management revenues (business line 4) are primarily comprised of federal government funding (80%), provided by the Canadian Food Inspection Agency, the Public Health Agency of Canada, PrioNet Canada (Network Centres of Excellence), NSERC-CRD, and Environment Canada. Provincial and foreign government funding of Response and Management programs constitutes the remaining 20%, with major contributions from Saskatchewan Environment and Health, Alberta Innovation and Science, Ontario Ministries of Health and Long Term Care and Agriculture Food and Rural Affairs, the United States Department of Agriculture and Atlantic provincial departments of the Environment, Health and Agriculture



Cash Revenues in 2007-2008 included $1,480,941 in support of the core program and a further $3,135,212 for targeted research programs (response and management, business line 4). In total CCWHC revenues for 2007-2008 were $4,616,355.





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