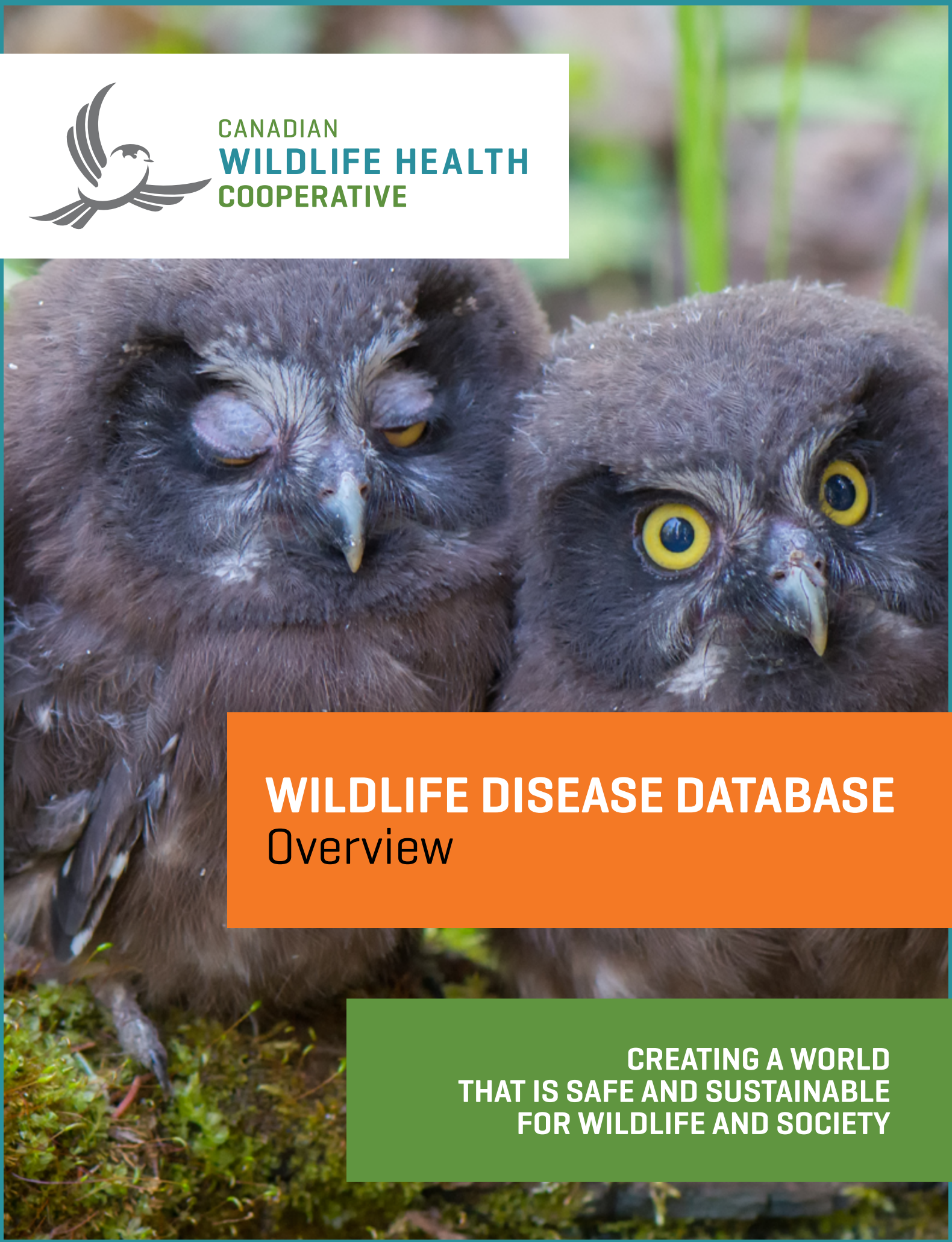
CANADIAN
WILDLIFE HEALTH
COOPERATIVE



WILDLIFE DISEASE DATABASE
Overview

**CREATING A WORLD
THAT IS SAFE AND SUSTAINABLE
FOR WILDLIFE AND SOCIETY**

OVERVIEW

The CWHC Wildlife Disease Database is a unique national repository that allows for real-time collaboration. The database eases data sharing and exchange between researchers, wildlife disease managers and other stakeholders and partners. Its adaptability accommodates the need to store, assess and communicate wildlife disease information for emerging issues and focused research as well as to provide longitudinal insights into trends in diagnostic submissions at the local, provincial and national level.

The database is primarily focused on providing a data storage medium for all types of wildlife disease related data. Data analysis is facilitated through a comprehensive export system so that users can extract large data sets and further manipulate or analyze those data with commonly-used statistical and spatial analysis software. The database also features end-user reporting, with reports being generated and sent by email to those people finding (Finders) or submitting (Submitters) samples, or other agencies on a per-incident or per-specimen basis, directly from the database.

One of the key strengths of the database is that it is a fully supported, custom built application dedicated solely to wildlife disease oriented data. The underlying data model was designed around the common work flow of Sample receipt > Testing > Diagnosis/Interpretation > Reporting.

The database utilizes large reference lists such as taxonomy and anatomy, which are used to present standardized terminology in pick lists and hierarchical trees to speed up data entry and ensure a high rate of data consistency and validity.

The CWHC employs a dedicated IT staff whose primary function is to maintain, improve and support the database. Because the design of the database is modular, new sections can be added to the database, for new projects or to meet new or changing demands, without compromising the core components or underlying architecture. This makes the database easy to modify for additional users or groups.

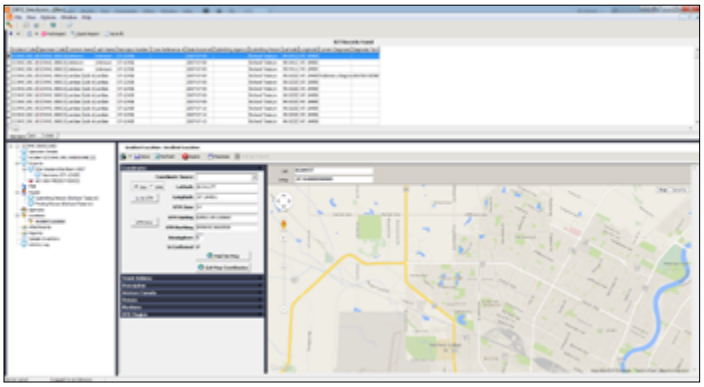
> “The CWHC has benefited from using a centralized database as it has allowed true, real-time collaboration and data sharing across all Canadian provinces”

CWHC IT staff have extensive knowledge of wildlife disease data capture and storage methods and requirements making them uniquely positioned to offer first-class technological solutions to wildlife health professionals.

The CWHC Wildlife Disease Database is one of the cornerstones of the organization’s capacity to deliver critical information to stakeholders in a timely manner in order to facilitate effective decision making and policy definition.

DATA MODEL

The CWHC database is a hierarchical system built on a model which groups data in a logical order. The core of this model is the Incident-Specimen relationship which is described below.



MAIN DATA ENTRY SCREEN

Incident

An incident is defined as any mortality event or sighting of one or more animals of one or more species sharing a common geographic location and point in time. An incident may contain one or many specimens. Under this definition, 3 dead birds submitted on the same day from a feeder in someone's yard would be considered one incident. A die-off of fish in the St. Lawrence estuary over a period of 6 months would not.

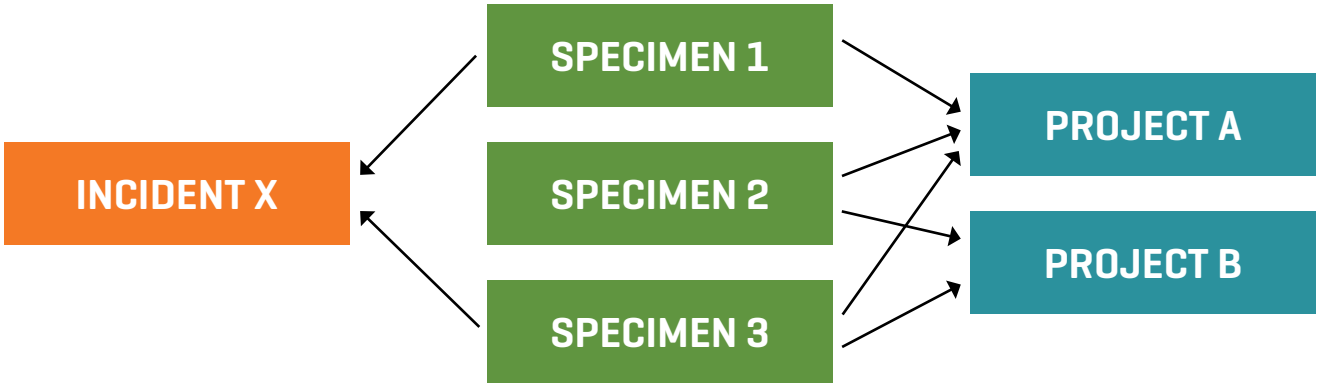
Specimen

A specimen is defined as a sample or whole carcass of an animal which is sent for testing.

Project

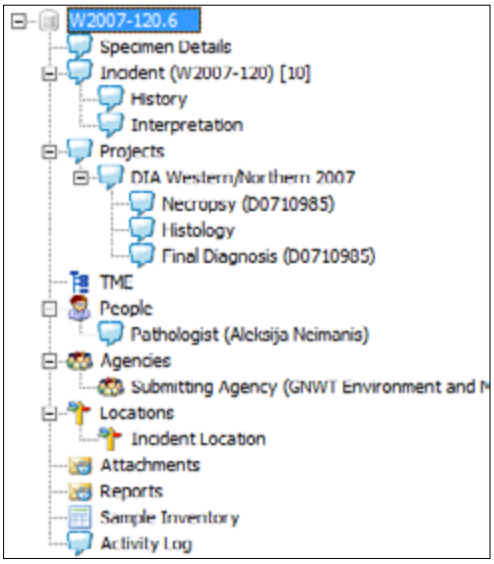
A subset of related data is classified as a project. In addition to the incident-specimen relationship, data are then grouped into different projects. These projects are based on passive surveillance and targeted surveillance such as Avian Influenza, but can also be set up for specific targeted research or single-survey use. Projects are typically further defined by a year and geographic or administrative region. While specimens can be a part of several projects, a specimen can only be associated with one incident. Projects are the primary way of assigning permissions and allowing access to data. This is detailed more in the Security section of this brochure.

The diagram below shows this relationship in the form of a possible scenario. All three specimens are part of the incident. All three are also a part of Project A, and Specimens 2 and 3 are also a part of Project B.



DATA ENTRY

Data entry for a mortality incident follows a typical sequence of events. First, specific submission information such as the incident's geographical location, affected species summary (species, number dead/received) and finder/submitter details are entered, followed by recording the biological data from each submitted specimen (i.e., age, sex and weight) and entering the history into a free text field. After post mortem examination of a specimen, diagnostic results are entered. This includes the necropsy findings and results of any ancillary diagnostic tests that are performed. The tests ordered and testing facility can be added to each specimen prior to receiving the results to facilitate tracking of samples. A wide range of ancillary tests can be accommodated for each specimen including Virology, Bacteriology, Parasitology, Histopathology, Radiology, Immunhistochemistry, etc. with the capability to add tests as new diagnostic modalities become available. A preliminary diagnosis can then be assigned to the specimen pending the completion of the diagnostic test results.



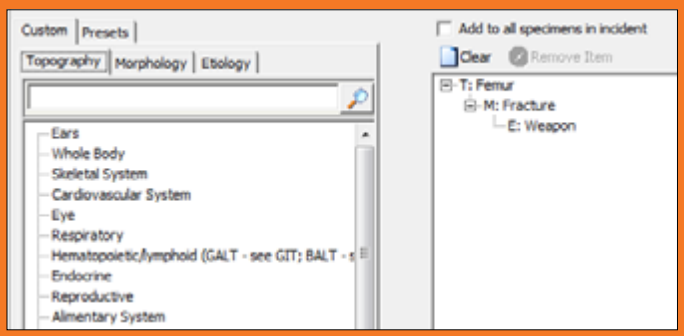
INCIDENT/SPECIMEN DETAIL MENU

Once all of the diagnostic test results are finalized for a specimen, a final diagnosis associated with the cause of death is determined and recorded for that specimen. After all individual specimens have been diagnosed for an incident, the final step of data entry involves adding an interpretation of the results to explain to the submitter and finder in an understandable way the overall cause of the mortality event.

External data from other sources or databases can be automatically entered into the CWHC database on a case-by-case basis to supplement the diagnostic and biological data.

KEY FEATURE: TME

The cause of death diagnosis and any incidental diagnoses are coded using a hierarchical TME (Topography/Morphology/Etiology) coding system that ensures all diagnoses are recorded in consistent format. This coding is hierarchically searchable and provides a reliable way in which to retrospectively identify and retrieve case material based on diagnostic criteria as defined by the user.



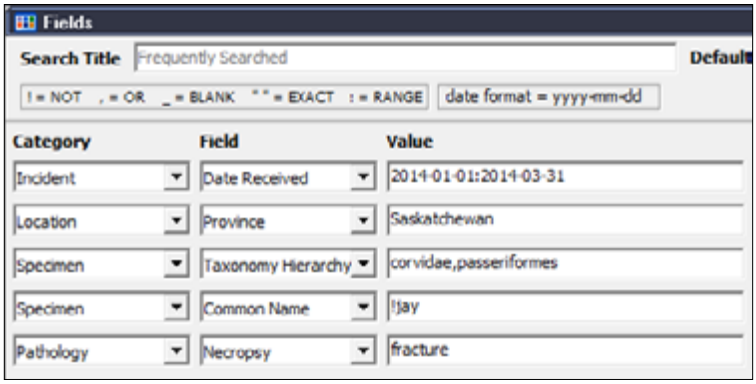
TME ENTRY SCREEN

SEARCH & EXPORT

SEARCH

The search functionality is comprehensive and sophisticated, with ranges, exclusions and free text searches all being possible.

This screenshot illustrates a search for all Corvids and Passeriformes, excluding Jays, in Saskatchewan, in the first quarter of 2014, where the necropsy identified a fracture of some type.



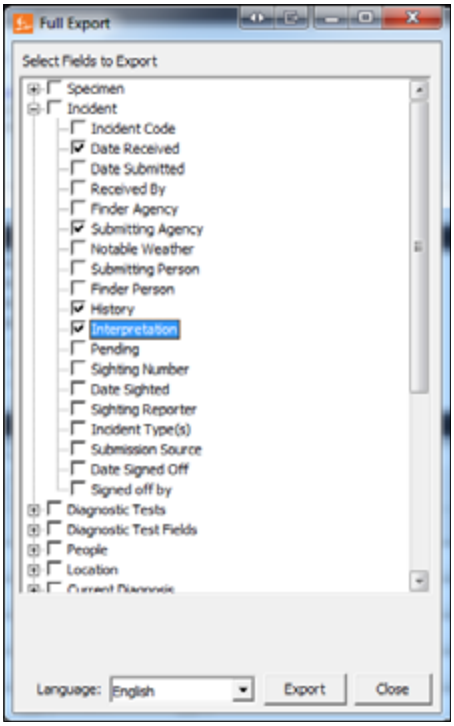
SEARCH PANE

Common searches can be saved, to reduce the amount of time spent entering search criteria. For example, if the above search was to be an on-going research interest, the dates could be omitted and the search could be loaded and executed on a periodic basis to check for new results.

EXPORT

Once a search has identified a data set, the export function provides a full list of fields that can be exported into an Excel spreadsheet, which allows for the exported material to be readily transferred to other statistical or GIS software.

Diagnostic reports can be generated from the database and sent via email or mailed as a hard copy to those who submitted specimens or identified the mortality incident. The diagnostic reports can also be shared with other interested parties and/or used for retrospective studies.

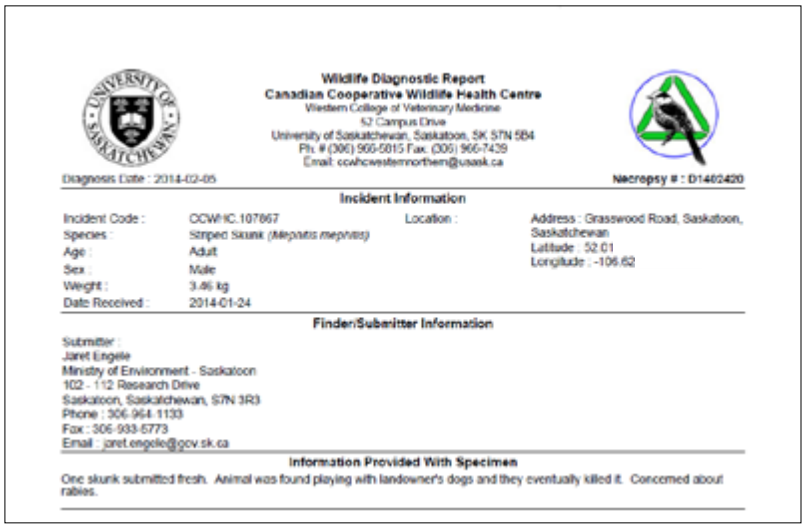


EXPORT WIZARD

REPORTING

Diagnostic reports can be generated from the database and sent via email or printed off for sharing with interested parties such as those people submitting or finding samples.

There are options for formatting reports so the diagnostic information can be highlighted in different ways to ensure clarity for the recipient and accommodate single versus multiple specimens submitted for a mortality incident.



Wildlife Diagnostic Report
Canadian Cooperative Wildlife Health Centre
Western College of Veterinary Medicine
52 Campus Drive
University of Saskatchewan, Saskatoon, SK S7N 5B4
Ph: # (306) 966-5815 Fax: (306) 966-7439
Email: ccwhcwesternnorthern@usask.ca

Diagnosis Date : 2014-02-05
Necropsy # : D1402420

Incident Information

Incident Code :	CCWHC.107867	Location :	Address : Grasswood Road, Saskatoon, Saskatchewan
Species :	Striped Skunk (*Mephitis mephitis*)		Latitude : 52.01
Age :	Adult		Longitude : -106.62
Sex :	Male		
Weight :	3.46 kg		
Date Received :	2014-01-24		

Finder/Submitter Information

Submitter :
Janet Engele
Ministry of Environment - Saskatoon
102 - 112 Research Drive
Saskatoon, Saskatchewan, S7N 3R3
Phone : 306-964-1133
Fax : 306-933-5773
Email : janet.engele@gov.sk.ca

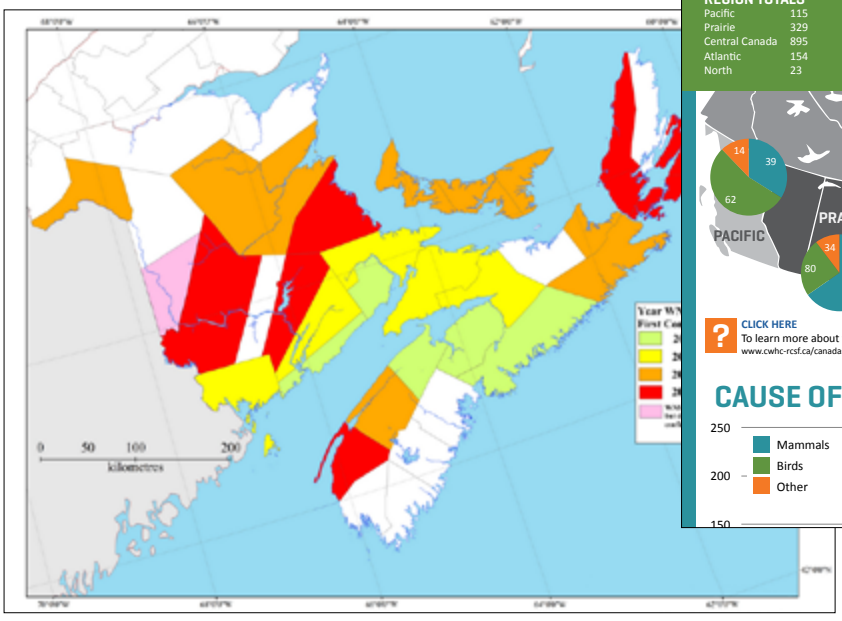
Information Provided With Specimen

One skunk submitted fresh. Animal was found playing with landowner's dogs and they eventually killed it. Concerned about rabies.

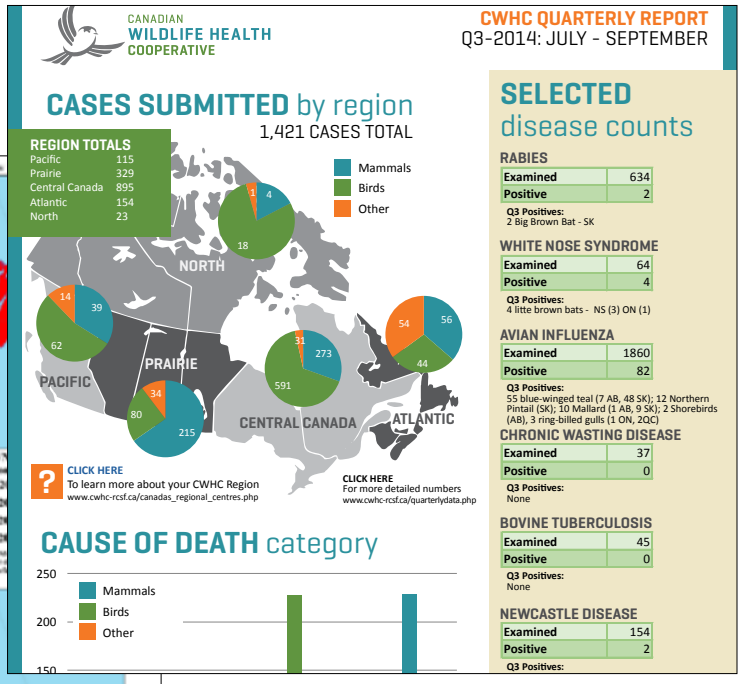
CWHC DIAGNOSTIC REPORT

Each organization using the database places their own letterhead on the report so the recipient can contact them with questions or additional information on the mortality incident.

In addition to individual diagnostic reports, individual diseases counts can be extracted from the database, aggregated, and presented through media such as the CWHC website, contractual reporting and summary quarterly reports which are used to inform partners and stakeholders with a view to guiding policy and decision making.



WNS MAP ON WEBSITE



CANADIAN WILDLIFE HEALTH COOPERATIVE

CWHC QUARTERLY REPORT
Q3-2014: JULY - SEPTEMBER

CASES SUBMITTED by region
1,421 CASES TOTAL

REGION TOTALS
Pacific 115
Prairie 329
Central Canada 895
Atlantic 154
North 23

Mammals
Birds
Other

NORTH
PRAIRIE
PACIFIC
CENTRAL CANADA
ATLANTIC

CLICK HERE
To learn more about your CWHC Region
www.cwhc-rcsf.ca/canadas_regional_centres.php

CLICK HERE
For more detailed numbers
www.cwhc-rcsf.ca/quarterlydata.php

CAUSE OF DEATH category
250
200
150
Mammals
Birds
Other

SELECTED disease counts

RABIES
Examined 634
Positive 2
Q3 Positives:
2 Big Brown Bat - SK

WHITE NOSE SYNDROME
Examined 64
Positive 4
Q3 Positives:
4 little brown bats - NS (3) ON (1)

AVIAN INFLUENZA
Examined 1860
Positive 82
Q3 Positives:
55 blue-winged teal (7 AB, 48 SK); 12 Northern Pintail (SK); 10 Mallard (1 AB, 9 SK); 2 Shorebirds (AB), 3 ring-billed gulls (1 ON, 2OC)

CHRONIC WASTING DISEASE
Examined 37
Positive 0
Q3 Positives:
None

BOVINE TUBERCULOSIS
Examined 45
Positive 0
Q3 Positives:
None

NEWCASTLE DISEASE
Examined 154
Positive 2
Q3 Positives:

CWHC QUARTERLY REPORT

ACCESS & SECURITY

DATABASE PERMISSIONS

PROJECT HIERARCHY

The CWHC database is used by all five Veterinary Colleges across Canada as well as the Dutch Wildlife Health Centre (DWHC), and the Northeast Wildlife Disease Cooperative (NWDC) in Northeast United States. Some partners and agencies, such as Saskatchewan Ministry of Environment also have direct access to the database to track results in real time. Due to the varied nature and levels of access required, the CWHC Database features a project-level permission schema that allows access to be limited to read-only or read-write for any set of given projects.

For example, NWDC users do not see CWHC data and reciprocally, CWHC users do not see NWDC data. Any external agencies are given read-only access to a limited number of projects which allows them to see the data only for that project. To add further security and to adhere to Canada's privacy laws, the addresses of those people finding or submitting samples is hidden to anyone who has read-only access to the database.

PHYSICAL SECURITY

The CWHC's servers are backed up nightly to a backup server which is continuously backed up to a secure, cloud-based backup service, (**Crashplan**). The servers are then backed up weekly to a tape backup system. The CWHC servers are located in a locked and monitored server room which is routed into an emergency backup generator. Due to these factors, CWHC has only experienced one significant hardware failure leading to down time since 2008.

INTELLECTUAL PROPERTY

Intellectual Property (IP) rights of data contained in the CWHC Database remain with the original owners. CWHC does not assume rights over any data stored for external organizations. All data entered as part of CWHC programs remain property of the CWHC. Ownership of data is typically established as part of an MOU signed by CWHC and any third-party that wishes to use the CWHC database to store their data.

DATA REQUESTS

Organizations handle data requests internally. Data stored in projects for external agencies is never released to third parties for any reason by CWHC staff. CWHC IT staff do have access to external agency data, for support reasons only.

ROADMAP

The CWHC will begin development of a significant overhaul of its database and data management systems in the spring of 2015. The database will be converted to be a responsive web application and will be expanded to include observational data as well as diagnostic and disease data.

The objectives of this redevelopment are:

- To make data entry easier and faster by developing more intelligence in the system to predict and suggest additional data points to add (e.g. reading a diagnosis and suggesting TME codings so that these would not have to be entered manually)
- To make extraction of data quicker and more reliable by implementing rigorous Quality Control and Quality Assurance protocols to ensure that data entered across Canada's regional centres is harmonized and more easily aggregated. The outcome of this will be better data which can be more readily transformed into knowledge and communicated to stakeholders.
  * External clients will be able to define their own business rulesets which can then be applied against their own data.
- To make the CWHC database accessible on any platform (desktop, laptop, mobile etc.) and any operating system (Windows, Mac, etc.)

CONTACT US

For more information, or if you would like a real-time demonstration of the CWHC database and/or a consultation with our IT experts, please contact:

Kevin Brown
CWHC Information Services Manager

Email: kbrown@cwhc-rcsf.ca
Phone: 1.306.966.2881
Fax: 1.306.966.7387

APPENDIX: KEY DATA POINTS

Incident	Date Received
	Date Sighted
	History
	Interpretation
	Diagnosis Summary
	Species summary
Location	Latitude
	Longitude
	Street Address
	City/Town
	Province/State
	Country
	Postal Code/Zip
	Location Description
	Coordinate Source
Specimen	Cross Ref
	Common Name
	Forensic Specimen
	Diagnostic Specimen
	Age Category
	Age Text
	Gender
	Mortality State
	How Found
	Storage
	Captivity Category
	Weight
	Width
	Length
	Height
	Date Submitted
	Birth Date
	Death Date
	Euthanized Method
	Human Interaction
	Outcome
	Nutritional Condition
	Comments
Necropsy	Necropsy
	Necropsy #
	Necropsy Performed By
	Date Necropsy performed
	Necropsy level
	Necropsy Location
Histology	Histology
	Histo Lab Ref #
	Histo Lab
	Histo performed by
	Date sent for histo
	Date histo results received
Diagnosis	Diagnosis
	Diagnosed by
	Diagnosing lab
	Date of Diagnosis
	Diagnosis Type
TME	Topography
	Morphology
	Etiology
Diagnostic Data	Bacteriology
	Immunohistochemistry
	Toxicology
	PCR
	Virology
	Parasitology
	Radiology
	Cytology
	Clinical Biochemistry
	Haematology
	Lab Results
	Electron Microscopy
	Rabies
	White Nose Syndrome
People / Organizations	Submitting Person
	Finding Person
	Submitting Agency
	Finding Agency
	Pathologist
	Assistant

* All diagnostic data pages are free text areas with additional available fields:
Lab reference #
Testing Lab
Performed By
Date sent for testing
Date results received

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CONTACT us

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Fax: 1.306.966.7387
Email: info@cwhc-rcsf.ca

www.cwhc-rcsf.ca