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Canadian Cooperative Wildlife Health Centre, Volume 8-1, Summer 2001

Canadian Cooperative Wildlife Health Centre

Centre Canadien Coopératif de la Santé de la Faune

Newsletter Volume 8 - 1, Summer 2001

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Chronic Wasting Disease in free-ranging mule-deer in Saskatchewan

News from the CCWHC

Raptor Carcasses Needed for Assessment of Lead Exposure: CWS and CCWHC cooperative project

While it has been known for decades that waterfowl and their predators are poisoned by lead through the consumption of shotgun pellets, lead exposure and poisoning in upland game birds and their raptorial predators has been little studied. Lead shot has been banned in North America for hunting of waterfowl, but continues to be used for upland hunting. A Canadian Wildlife Service (CWS) survey of lead exposure in woodcock, a migratory upland game bird, revealed a surprisingly high prevalence of elevated lead in this species. In addition, there are indications of lead poisoning in raptors, including golden eagles in Canada and California Condors from consumption of upland game animals killed with lead ammunition,. A pilot CWS study carried out in conjunction with the Canadian Cooperative Wildlife Health Centre (CCWHC) at the University of Guelph determined that approximately 28% of raptor carcasses sampled had tissue-lead levels indicative of higher-than-background exposure (including almost a third of all Red-tailed Hawks and Great-horned Owls and half of all American Kestrels). Levels in five birds (2 Red-tailed Hawks, one Great-horned Owl, one Bald Eagle and one Turkey Vulture) were sufficiently elevated to have caused lead poisoning. The source(s) of lead exposure in terrestrial-foraging raptorial predators have not yet been identified, but may include lead shot embedded in upland game animals, such as rabbits, grouse, and others. Further research is required to better understand the extent and severity of lead exposure in upland raptorial species in Canada, to aid in deciding whether broader non-toxic shot regulations, or other management actions, are needed. Therefore, WE ARE REQUESTING CARCASSES OF ALL RED-TAILED HAWKS, GREAT HORNED OWLS AND TURKEY VULTURES be sent to your nearest CCWHC Regional Centre. For more information, please contact Dr Doug Campbell, CCWHC (Guelph), at 519-823-8800 ext. 4556 or by email at dgcampbe@uoguelph.ca

Feature Articles

Radio-telemetry for Detecting and Understanding Disease

Radio-telemetry now is widely used in wildlife research and management. Whatever their primary purpose, all radio-telemetry studies have the potential to generate important new information about the ecology and impact of disease on wild populations. This article highlights the value to disease research of radio-telemetry and encourages all who use radio-telemetry to collaborate with the CCWHC or other disease specialists so as to capture the full benefits of these studies. A major function of the CCWHC is disease surveillance, in which we attempt to monitor the occurrence of health problems in free-living animals. To understand and assess the significance of a disease, it is important to (1) detect affected (sick or dead) individuals, (2) count the affected individuals accurately, (3) relate the number of affected individuals to the population at risk, and (4) relate occurrence of disease in time and space to other factors in the environment. Many occurrences of disease among wild animals go unrecognized. When disease is detected, often only the tip of a much larger ice-berg is visible, and the actual effect of disease may be much greater than the portion that we are able to see.

The difficulties in finding and counting sick and dead animals are well known, e.g., only 6% of marked duck carcasses were detected by searchers in a Texas marsh, leading Stutzenbacher et al. (1986) to conclude that: " casual searches would result almost invariably in negative findings even though large numbers of birds actually died". Similarly, < 27% of the deer carcasses present on an area in Montana after a disease outbreak were detected by hunters (Swenson, 1979). Because of these difficulties, investigators may need to use special techniques to improve their ability to find sick and dead animals during suspected disease occurrences. An example of such an approach is the use of trained dogs. In one study, dogs found 92% of passerine bird carcasses placed on plots, compared to 45% for human searchers (Homan et al., 2001). When dead animals are found, the next problem is to determine the size of the population at risk. This is usually very difficult and in most situations only a crude estimate may be possible. The mortality rate (number dead/number at risk) is a very important statistic in assessing the significance of a disease One would also like to know where the animals have been and what factors they have been exposed to prior to the outbreak, because this may explain why the disease occurred. This type of information is seldom known in wild animals, because of the difficulty in following individual animals.

Radio-telemetry now is a common tool in wildlife research that has tremendous potential for increasing understanding of disease in wild populations. It allows individual animals to be followed over time, mortality can be detected and carcasses recovered for examination, and the marked animals form a population at risk of known size and composition, so that actual mortality rates can be determined. Telemetry can be used in two majors ways to for this purpose. The first is in studies related directly to disease, the objective of which is to determine the fate of individuals exposed to various risk factors. This method is being used in the study of waterfowl botulism on the prairies. A key question being investigated is the effectiveness of carcass collection and disposal as a management tool to reduce mortality in botulism outbreaks. In the study, radio-transmitters are placed on moulting mallards on lakes where botulism is expected to occur. When botulism occurs, some lakes are cleared of carcasses regularly and other "control" lakes have no carcass pickup. The birds with radio transmitters are monitored daily, and deaths are detected soon after they occur. Dead birds are examined to determine the actual cause of death. The method is providing an accurate measure of the mortality rate due to

botulism that can be compared among lakes being managed in different ways. Because the location of the birds is known each day, the study also is providing valuable information about the distribution and movement patterns of birds that eventually succumb to botulism compared to those that survive through an outbreak. Murray et al. (1997) used radio-telemetry in a similar manner to monitor the effects of parasites, nutrition and predation on a snowshoe hare (Lepus americanus) population and discovered that there were complex interactions among the three factors.

The second way that radio-telemetry can provide information about disease is as an adjunct to studies being done for other reasons. Where telemetry has been used in this way, the studies have confirmed the covert nature of many diseases and have provided a window on the significance of disease. Three recent occurrences of rabies were detected in Alaskan wolves carrying radios as part of ecological studies. Without radio-telemetry, most deaths from rabies would have gone unnoticed" (Ballard and Krausman ,1997). Similarly, Beringer et al. (2000) reported that Epizootic Hemorrhagic Disease (a viral infection) killed 8% of a group of deer being followed by radio-telemetry in Missouri. Despite the relatively high mortality rate, the Department of Conservation received no reports of sick or dead deer. The authors' conclusion was that this event would have gone unrecognized without the radio-telemetry study. Two studies of striped skunks provide even more dramatic evidence of the value of radio-telemetry in detecting hidden mortality. In North Dakota, 70 % of a population of skunks followed by radio-telemetry died of rabies during an epizootic "that likely would have gone undetected" without the study (Greenwood et al., 1997). In that study, almost one-third of the animals died below ground. A study of winter ecology of striped skunks is occurring in Saskatchewan. All skunks that die are examined. In the first year of the study, 60% of the radio-collared animals died of rabies, although there was little evidence of a major rabies epidemic occurring in the area. Other animals succumbed to unusual opportunistic bacterial infections that had not been recognized previously in skunks. Because radio-marked animals provide such a unique opportunity to learn more about causes of mortality in wild animals, the CCWHC is keen to cooperate with researchers in such studies. The regional centres will provide assistance in the diagnosis of cause of death in animals that die during studies, and would be pleased to cooperate in designing studies to maximize information return related to animal health.

Ballard, W.B., and P.R. Krausman, 1997. Occurrence of rabies in wolves in Alaska, J. Wildl. Dis. 33:242-245
Beringer, J., L.P. Hansen, and D.E. Stallknecht, 2000. An epizootic of hemorrhagic disease in white-tailed deer in Missouri. J. Wildl. Dis. 36: 588-591.
Greenwood, R.J., W.E. Newton, G.L. Pearson, and G.J. Schamber. 1997. Population and movement characteristics of radio-collared skunks in North Dakota during an epizootic of rabies. J. Wildl. Dis. 33:226-241.
Homan, H.J., G. Linz, and B.D. Peer, 2001. Dogs increase recovery of passerine carcasses in dense vegetation. Wildl. Soc. Bull. 29:292-296.
Murray, D.L., J.R. Cary, and L.B. Keith, 1997. Interactive effects of sublethal nematodes and nutritional status on snowshoe hare vulnerability to predation. J. Animal Ecol. 66:250-264.
Stutzenbacher, C.D., K. Brown,., and D. Lobpries, 1986. Special report: an assessment of the accuracy of documenting waterfowl die-offs in a Texas coastal marsh, in: Lead Poisoning in Wild Waterfowl, (J.S. Feierabend and A.B. Russell, eds). pp. 88-95, National Wildlife Federation, Washington.
Swenson, J.E., 1979. Effects of a hemorrhagic disease epizootic on a white-tailed deer population in eastern Montana. Proc. Mont. Acad. Sci 38:25- 32.

Update on West Nile Virus in North America

Summer 2000

West Nile Virus (WNV) first appeared in North America in the summer of 1999 in an area in and around New York City (see Vol. 6, No. 2, Winter, 1999). During the short 2-3 month outbreak in 1999, the virus caused illness and death in thousands of North American wild birds, particularly American Crows, and caused fatal disease in 7 people and a number of horses. Most virus activity was in the area close to New York City, but virus was detected up to 200 km away. In the winter and spring of 1999-2000, the CCWHC worked with Health Canada and provincial ministries of health to plan and implement a national surveillance program for WNV in Canada during the summer of 2000. Based on events in the 1999 outbreak, it was anticipated that detection of virus in dead wild birds might be the most sensitive method of tracking the spread of the virus across North America. The CCWHC undertook to organize and operate the wild bird surveillance component of the overall WNV surveillance program, under the direction of Ian Barker of the Ontario Regional Centre. Working with each province individually. from Newfoundland and Labrador to Saskatchewan, mechanisms were put in place to call on the public to be vigilant for dead birds and to secure specimens for examination at each CCWHC Regional Centre and at the provincial veterinary diagnostic laboratories in New Brunswick, Newfoundland and Nova Scotia.

A total of 2,288 birds were examined during the surveillance program in 2000, 1,562 of these were handled by the Ontario Regional Centre (Figs 1 and 2). All birds that were not too decomposed were examined for evidence of disease by autopsy and, if warranted, by microscopy. Specimens from birds with evidence of disease compatible with that seen in WNV -infected birds in the 1999 outbreak were sent to the Canadian Food Inspection Agency's National Centre for Foreign Animal Diseases in Winnipeg to be tested for WNV. A total of 185 birds were tested for virus; no infected birds were found. Overall, the sensitivity of the surveillance effort in 2000 was low due to the small number of birds submitted for examination. In New York State alone about 12,000 dead birds were received in the WNV surveillance program, and 4,000 of these were tested for virus. Sensitivity was further decreased by the limited laboratory capacity available in Canada to test for the virus. Many potentially WNV-infected birds were not tested because they did not have lesions; we now know, from the larger surveillance effort in the USA in 2000, that many infected birds show no evidence of infection at autopsy. Submission of samples for examination occurred mostly in Ontario in association with the first media reports of the virus moving toward Canada through New York State (Fig. 3). At peak, the submission rate exceeded the capacity of the CCWHC to handle specimens, resulting in processing delays. However, high levels of birds submission were not sustained, even though the media continued to cover the approach of the virus right up to the Canada-US border.

In the USA, WNV gradually extended its range centrifugally during the summer of 2000, spreading east, north, south and west several hundred kilometres from its area of distribution at the end of 1999, and eventually reaching all counties in New York State that border Ontario and Quebec (Fig 3). Surveillance based on dead birds provided the best means of detecting WNV. Thousands of American crows were killed by the virus as were smaller numbers of many other species of native birds. Nineteen

people are known to have become ill from WNV and two died. Sixty-five horses died or were destroyed because of infection.

Summer 2001

While it is not known how WNV will behave in 2001, it is expected that the virus will continue to expand its range in North America as it did during the summer of 2000. The CCWHC will carry out intensive surveillance for WNV in wild birds in 2001 in cooperation with Health Canada and the provinces. This year, the program will be focussed on members of the crow family only: Crows, Ravens, Blue Jays, Gray Jays and Magpies. Every suitable dead bird submitted for examination will be tested for WNV at Health Canada's laboratories in Winnipeg using the PCR technique. In addition, all sightings of dead crows and other members of the crow family will be recorded and mapped even when specimens for testing are not available. This is being done because analysis carried out in New York State in 2000 showed that a sharp increase in such reports was a reliable indication that WNV had spread to a new area. All sightings will be mapped on a daily basis and the maps will help health authorities focus their response efforts in the event that WNV is detected. Intensive surveillance is being carried out in southern Ontario and Quebec, and in the Maritime Provinces, while surveillance of lower intensity is taking place in Saskatchewan, Manitoba and Newfoundland. Surveillance for WNV in other parts of Canada will be undertaken if warranted, based on results from the core program. The success of this surveillance program depends entirely on the participation of government agency personnel and the public to find and report dead Crows, Ravens, Blue Jays, Gray Jays and Magpies, and to assist with the collection of specimens. The system for reporting sightings and for collecting and submitting specimens differs from province to province. Visit the West Nile Virus section of the CCWHC website (http://wildlife.usask.ca) or call 1-800-567-2033 for detailed information.

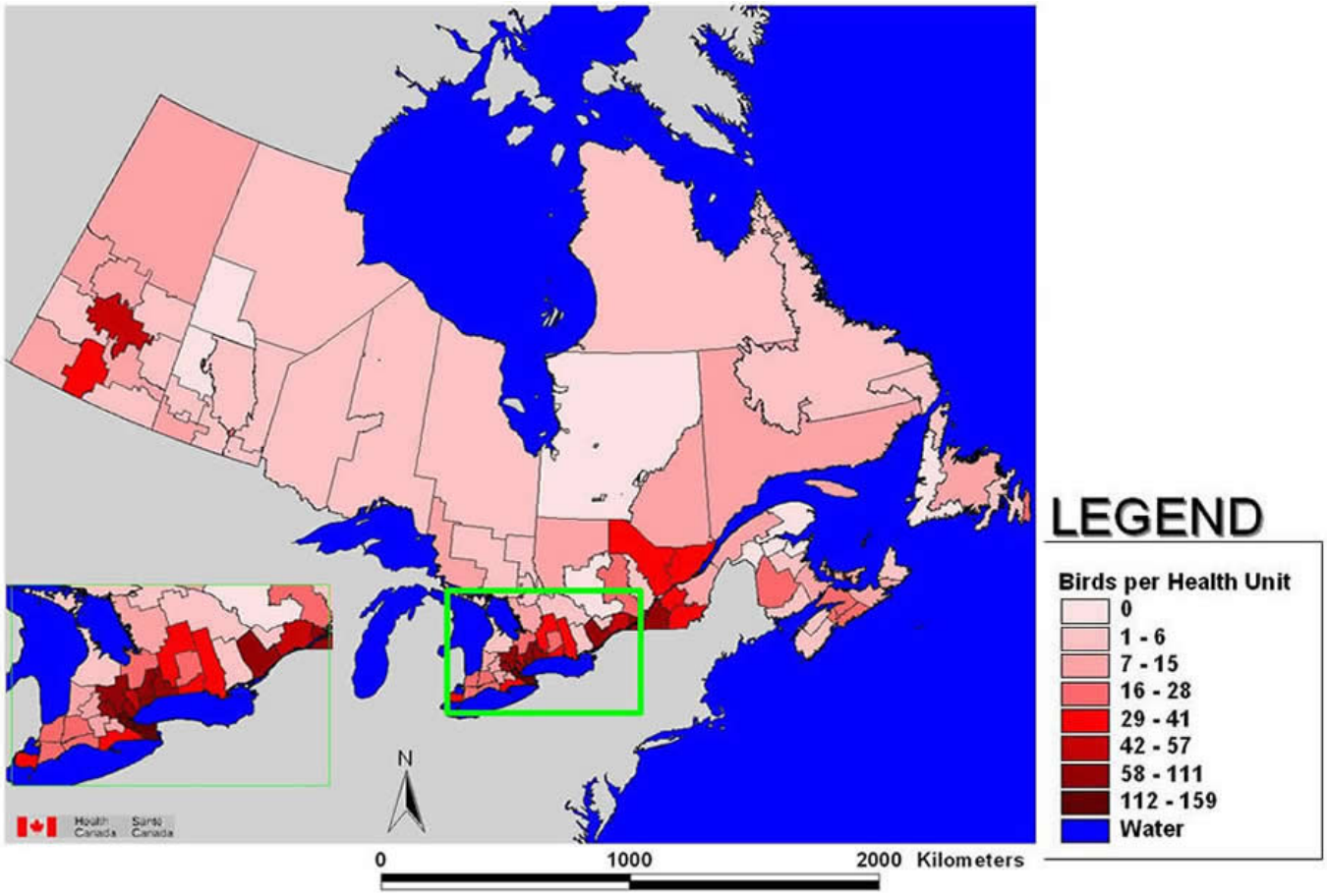

Fig. 1 Weekly submissions of dead wild birds to the West Nile Virus surveillance program, Summer 2000.

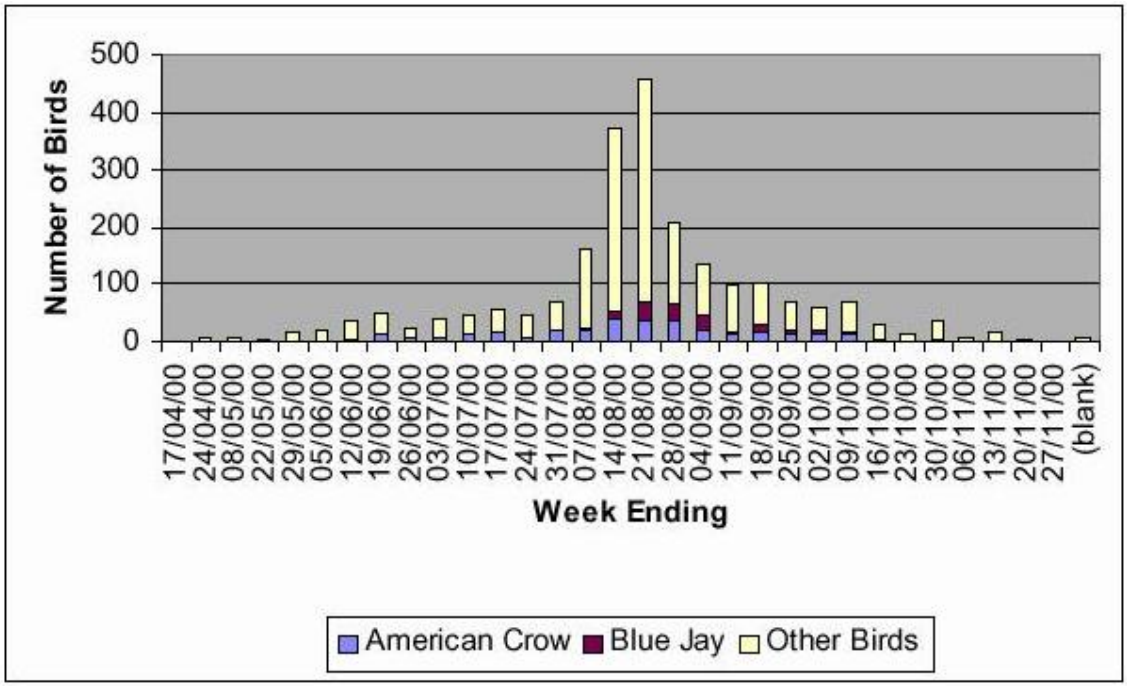

Fig. 2 Distribution of dead wild birds submitted for examination in the West Nile Virus surveillance program in Summer 2000.

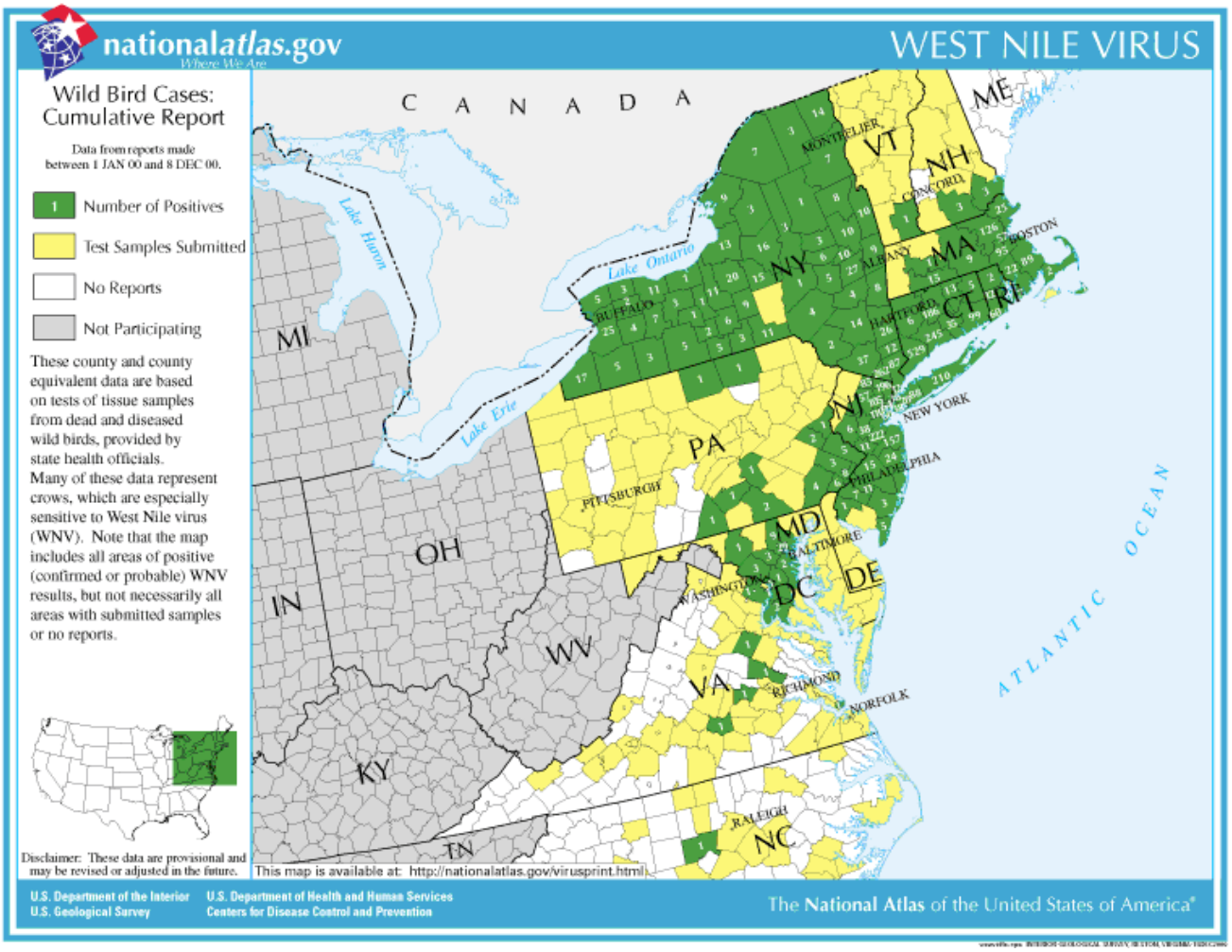

Fig. 3 Map showing the area in which West Nile Virus was detected in the USA during the outbreak in Summer 2000

Disease Updates

Atlantic Region

French heartworm in red fox and domestic dogs in Newfoundland

The nematode parasite Angiostrongylus vasorum (French Heartworm) continues to be a concern on the eastern Avalon Peninsula of Newfoundland as a significant cause of debilitation in red fox and dogs. Veterinary clinics are seeing increased numbers of hunting dogs with chronic coughs. Wildlife officials found numerous sick foxes last summer and winter, either by the roadside, on people's property, or hit by vehicles, that had extensive pulmonary damage caused by this parasite. Aberrant migration of first-stage larvae of this parasite may also occasionally cause severe brain damage in these animals. Studies on this parasite, which is common in Europe but unknown in North America other than in eastern Newfoundland, are being carried out through Lakehead University (Dr. Murray Lankester) and the Atlantic Veterinary College, University of Prince Edward Island (Dr. Gary Conboy). More information can be found at: http://www.gov.nf.ca/agric/her&rab/Heartworm.htm. (Dr. Hugh Whitney, Provincial Veterinarian, Animal Health Division, Newfoundland Department of Forest Resources & Agrifoods)

Raccoon Rabies Reaches New Brunswick

Brunswick As of April 6, 2001, New Brunswick has had a total of 26 wildlife cases of the mid Atlantic raccoon strain of rabies. All of these rabid animals have been found in or near St. Stephen, New Brunswick, on the U.S. border. Eighteen of the rabid animals were raccoons and eight were striped skunks. The first New Brunswick case of raccoon strain rabies was diagnosed in early September, 2000. Many of the early rabies cases involved skunks, not raccoons, but most of the recent cases have been raccoons. The New Brunswick government is doing enhanced passive surveillance for rabies in southwestern New Brunswick, especially for animals exhibiting abnormal behaviour, animals that were found dead in unusual circumstances, or animals that came in contact with humans or domestic animals. (Jim Goltz, NB Dept. of Agricuclture, Veterinary Diagnostic Laboratory, Fredericton, NB).

Neurological Disease in Moose in Nova Scotia

Moose mortality is being investigated as a part of an ongoing moose study initiated by the Nova Scotia Department of Natural Resources. In 2000, this resulted in a detailed post mortem examination of twelve moose submitted to the Atlantic Veterinary College diagnostic laboratory. Emaciation or trauma was the cause of death in six of the animals (see Figure 4). The remaining individuals all exhibited neurological abnormalities prior to their death. The abnormalities ranged from aberrant behaviour such as loss of fear of humans and circling, to locomotor difficulties such as incoordination and inability to rise

due to paralysis of the hind legs. Parelaphostrongylus tenuis is potentially present on the range of these moose, so it was strongly considered as a cause of their neurological problems. Focal eosinophilic inflammation compatible with aberrant migration of P. tenuis larvae was present in the brain and/or spinal cord of two of the moose, although the larvae themselves were not identified in either animal. The four remaining moose also had brain lesions, but the changes were not consistent with those of parelaphostrongylosis. In these cases, the inflammation was diffuse (i.e., found throughout all levels of the brain, spinal cord and meninges) Fig. 4 - A moose unable to rise due to hind limb weakness.

This animal had diffuse nonsuppurative inflammation in the central nervous system. rather than focal as would be expected with a parasitic tract. Also, the inflammation consisted of plasma cells, lymphocytes and macrophages, with a complete absence of the eosinophils typically associated with a parasitic problem. The lesions were sufficient to have been related to the behaviour observed in the moose but, unfortunately, their cause was not determined. These microscopic changes are most suggestive of a virus. However, other pathogens (eg. protozoal organisms), nutritional diseases and toxicities also are being considered. Post mortem examinations of moose exhibiting neurological abnormalities will continue; but capturing one of the affected moose alive for monitoring in captivity also is a possibility. This would enable additional clinical diagnostic work to be performed as well as observation of the progression of the disease in an attempt to determine the cause of the problem. (Scott McBurney, CCWHC - Atlantic Region; Dennis Brannen, Acadia University; and Tony Nette, Nova Scotia Department of Natural Resources).

Quebec Region

Brain Abscesses in White-tailed Deer

In January 2001, a white tailed deer (Odocoileus virginianus) was submitted for necropsy to the Canadian Cooperative Wildlife Health Center of the Faculté de médecine vétérinaire (FMV) of the Université de Montréal (Saint-Hyacinthe, Québec).The animal had been seen near a private property in Marieville, a small town located near Saint-Hyacinthe, and appeared weak. The same deer was then found dead a few days later and submitted for post-mortem examination. It was an adult male weighing 70.45 kg. Its muscle mass was poor.. No body fat stores were detected. The two wounds resulting from the loss of the deer's antlers, located over the pedicles, were covered by reddish scabs under which a thick pus was detected. The lateral right side of the head also had a greenish scab mixed with clumps of fur. The exudate appeared to have traveled caudodorsally within the subcutaneous fascia overlying the face of the animal. A well-delineated focus of necrosis measuring approximately 3.0 cm in diameter was found within the dorsal potion of the brain (cerebrum) and was filled with pus. The abscess involved the superficial cortex of the left parietal lobe. The meningeal lining covering that portion of the brain appeared thickened and was covered by a similar exudate. Two

small osteolytic foci were located in the calvarium adjacent to the exudate. These areas were circular in shape and measured approximately 2.0 to 3.0 cm in diameter.

Pneumonia was present in 50% of the right lung. Microscopic evaluation confirmed the brain lesion to be an abscess with Gram-positive bacteria, and the lung to be affected with a bronchopneumonia. Arcanobacterium pyogenes was isolated in high number from a meningeal swab as well as from specimens of cerebrum (abscess), skin, tracheobronchial lymph nodes and right pulmonary parenchyma. Pasteurella multocida was also isolated in high number from specimens of lung tissue, from a tracheal swab, from samples of tracheobronchial lymph nodes and to a lesser extent from various internal organs (liver, kidney, spleen). The cerebral lesions observed in this animal were compatible with those of the intracranial abscess-suppurative meningoencephalitis complex of the white-tailed deer.

Such cases are usually observed between October and April and are mostly detected in males. It is believed that the males cause these self-inflicted lesions during the rut either by rubbing their antlers against trees, by confronting other males or maybe because of nutritional stress linked to this period. Males are more subject to develop such lesions because the antler's pedicles can get easily infected during the growth or loss of the antlers. This condition does not appear to be highly prevalent within the white tailed deer population. A retrospective study of the Cooperative Wildlife Disease Study, based on data including 683 deer examined between 1971 to 1989, revealed that only 24 of these had a cerebral abscess (4.0 %: 21 males and three females. The mean age was 3.2 years. Most of these animals were free ranging wildlife. Note that it would be unsafe to eat the carcass of a deer with a brain abscess since bacteria may have spread throughout the body. A second affected White-tailed deer was examined after having been hit by a car in early 2001. The deer was a male, 2 ½ to 3 ½ years of age, that was found on the side of the road in La Présentation, a small village located near Saint-Hyacinthe. Only the antlers and the attached portion of skull bone were collected and submitted for examination. There was thick greenish pus under the skin surrounding the antler's pedicles and there was erosion of the skull bone typical of the reaction to bone that occurs around brain abscesses. Hunters should be aware that it is unsafe to eat the meat of deer with brain abscesses. These animals can have bacterial infections that have spread to many different parts of the body, as was the case in the first deer described above. (André D. Dallaire, CCWHC - Québec region)

Ontario Region

Suspected predation by ravens on nesting painted turtles

In early July, 2000 a dozen adult painted turtles were found dead along a railway track near Fort Frances, Ontario. The turtles were found dead approximately 150 metres from a crossing of a gravel road near a lake. They were found in various postures, some on their backs, some on their plastrons. There were reports of at least 8 other turtles in other

locations, all looking much the same. The turtles appeared to have died suddenly and had subsequently been scavenged. The 12 carcasses were collected and sent to the CCWHC lab in Guelph. They had likely been dead for some time, possibly since the nesting period, as the majority of the flesh had been removed and the interior invaded by insects. Most of the turtles were intact with the exception of holes, approximately 2-3 cm in diameter, on the inner aspect of upper hind limbs, adjacent to the plastron. The head and legs were present on most of the carcasses. Possible causes of death considered at the time included some form of toxic exposure or lightning strike transmitted along the rail line.

Similar, unexplained scattered mortality of adult turtles had been seen in the Kenora area as well. One resident described to MNR personnel seeing a group of ravens flip a turtle on its back and peck a hole into its upper leg, through which they dragged the eggs and viscera of the turtle. This description matched the findings on the carcasses almost exactly. Predation had not initially been considered a likely possibility, since most mammalian predators, such as raccoons, do considerable damage to the distal limbs. However, based upon the resident's description, the circumstances and the appearance of the carcasses, this seems to be the most likely explanation of the cause of death of these turtles. Painted turtles and ravens both have wide distributions across North America, but there are only a few areas of overlap, including northwestern Ontario, and thus relatively few opportunities for this behaviour to develop. However, ravens are well known for their intelligence, and should this behaviour become widespread where turtles and ravens occur together, it might locally affect turtle populations through the removal of mature reproductively active females. Further evidence for this hypothetical explanation of the deaths of these turtles will be sought during this year's nesting season. (Doug Campbell, CCWHC, Guelph; Darren Elder, MNR, Fort Frances; Lil Anderson, MNR, Kenora).

Western and Northern Regions

Marine Mammals in British Columbia

The Animal Health Centre (B.C.Ministry of Agriculture, Food and Fisheries) did 25 autopsies on marine mammals from B.C. in 2000 and examined tissues submitted from an additional 10 animals. This work is done in collaboration with Fisheries and Oceans Canada, the Vancouver Public Aquarium Marine Science Centre, and the Saltspring Island Wildlife Natural Care Centre. The specimens included: 22 seals, 10 whales and 3 sea otters. Diagnostic conclusions that could be reached are tabulated below.

Table #1. Results of Marine Mammal autopsies in British Columbia in 2000.

Species	# and Age	Autopsy Results
Harbour Seal(1)	13 Neonate/Juvenile	Bacterial infection (Enterococcus faecalis)
Harbour Seal (2)	4 Juvenile	Pneumonia caused by bacterium Streptococcus phocae
Harbour Seal(3)	2 Juvenile	Necrosis of adrenal glands from infection with phocid herpesvirus I
Harbour Seal	1 Juvenile	Bacterial infection (septicemia and encephalitis) with Listeria monocytogenes
Sea Otter (4)	2 Adult	Necrosis and fibrosis of heart
Dall's Porpoise (5)	1 Adult	Pneumonia due to fungus Cryptococcus sp
Harbour Porpoise (5)	1 Adult	Pneumonia due to fungus Cryptococcus sp.
Killer Whale (6)	1 Adult	Bacterial infection with Edwardsiella tarda
Grey Whale (7)	1 Adult	Emaciation, seropositive for Brucella sp.

1. Contaminated milk replacer was the source of infection. Pneumonia due to inhalation of milk and stomach content was part of the syndrome.
2. This condition has been reported previously in South Africa and Norway.
3. Diagnosis was confirmed by polymerase chain reaction (PCR) and serology at the University of California (Davis)
4. No cause for this condition could be found. Four identical cases had been seen at the AHC in previous years.
5. These appear to be the first cases of cryptococcosis reported in free-living cetaceans. There was severe pneumonia and wide dissemination to lymph nodes.
6. Whale number J18. There was severe infection, inflammation and ulceration of the skin which dissected deeply through the body wall and perforated into the abdominal cavity. A previous blubber biopsy had indicated a high concentration of dioxin in this animal. The contribution of dioxin to the death of the whale, if any, is unknown.
7. No cause of death was evident.

The bacterium Brucella sp. was not isolated from tissues but serological evidence of exposure in wild Grey Whales is of interest as scientists try to learn more about Brucella in marine mammals . (Steven Raverty, Animal Health Centre, BCMAFF, Abbotsford, BC).

Chronic Wasting Disease in free-ranging mule-deer in Saskatchewan

Chronic wasting disease or CWD has been diagnosed recently in 2 wild mule deer in the Manito Hills region of western Saskatchewan near Lloydminster. Both deer were detected during CWD surveillance programs instituted by Saskatchewan Environment and Resource Management. The first was an approximately 2.5 year old mule deer buck shot in November 2000 during the regular hunting season and was 1 of approximately 1000 hunter-shot deer and elk tested throughout the province that year. The second was an approximately 4 year old mule deer buck shot in May 2001 during a CWD surveillance program in the Lloydminster area in which 211 deer were collected specifically to test for CWD. Both deer appeared healthy when shot and the diagnosis was based on positive immunohistochemical staining of abnormal prion protein in the obex of the brain. The two locations where the deer were shot are approximately 5 km apart and are less than 10 km from the Alberta-Saskatchewan border.

Surveillance is continuing to better delineate the geographic extent and prevalence of this disease. It is anticipated that over 5,000 wild deer and elk will be tested from Saskatchewan in 2001. CWD was first detected in the 1960s and 1970s in deer and elk held in research facilities in Colorado and Wyoming. In the 1980s, the disease was recognized as being endemic in mule deer, white-tailed deer and elk in a contiguous area of southeastern Wyoming and northeastern Colorado. In the fall of 2000, the first case was recognized in an adjacent area of Nebraska. Until the disease was diagnosed in a wild mule deer in Saskatchewan this U.S. population was the only population of free-ranging deer and elk known to have CWD. CWD has been diagnosed in game-ranched elk in Colorado, Nebraska, Montana, Oklahoma, South Dakota and Saskatchewan. The first case of CWD in farmed elk in Saskatchewan was diagnosed in 1996. This was followed by another case on a different farm in 1998, and by the spring of 2001 twenty-five elk farms were known to have had cases of CWD. Many of these cases have been detected as part of CWD control measures.

The introduction of CWD into Saskatchewan can be traced back to the importation of CWD infected elk from the US. Chronic wasting disease is one of a group of diseases called transmissible spongiform encephalopathies or TSEs which include scrapie in sheep and goats, BSE or "mad cow disease" in cattle and Creutzfeldt-Jakob disease in humans. Our understanding of these diseases and CWD in particular is limited. The disease is thought to be transmitted from animal to animal by direct contact and by contamination of pasture. It is invariably fatal once clinical signs are observed. It has a long incubation period (youngest animal diagnosed with natural CWD was 17 months) and there is no test available for live animals. Disease modeling of wild deer populations suggests a CWD prevalence of 5% will begin to reduce deer populations, and that if the disease is to be eradicated, management efforts will have to be sustained for several decades. The

duration of disease control measures and their potential for success is dependant on early intervention. Mule deer, white-tailed deer and elk are the only species which appear to be naturally susceptible to CWD. Laboratory experiments indicate transmission to other species is extremely unlikely but without further research we cannot say with certainty that the disease is not transmissible to cattle or humans. Emergence of CWD in wild deer in western Canada will have significant implications on all aspects of deer management including sport hunting, deer farming and translocation. (Trent Bollinger, CCWHC W/N Region).

Online @ http://wildlife1.usask.ca/newsletters/newsletter8-1.htm