Newcastle disease virus

(*a paramyxovirus*)

in Alberta

G Wobeser CCWHC

Common name

Newcastle disease, Newcastle's, NDV

Scientific name

a paramyxovirus, Newcastle disease virus

What's Bugging Wild Critters?

Fact sheet #25: Newcastle disease virus

Significance

Newcastle disease virus (NDV) exists in a variety of strains and occasionally causes mortality in colonial-nesting birds. Some strains have significant global economic importance as diseases of poultry.

What? Where? How?

A wide range of wild birds throughout the world can provide suitable habitat for NDV. However, the relationship generally is quite benign and the birds are no worse for sheltering (hosting) the virus. Nervous tissue, particularly the brain and spinal cord, offers the optimum environment for NDV survival. Under certain conditions, the virus population can build in the nerve tissues and individual birds die. Outbreaks of noticeable mortality occur occasionally in colonies of cormorants, pelicans, and gulls. In these situations, damage to the nervous tissue is seen as partial paralysis of the wings and legs. Often there is loss of control of the wing and foot on one side of the body while the other side appears normal. The affected wing may be held away from the bird's body or may hang limp and useless. Such birds obviously cannot fly. The affected foot may have the toes tightly clenched and, when walking, the bird limps or falls over. On the water, such birds are unable to lift off or to dive and often swim in circles. Sick birds often are weak and unable to avoid humans.

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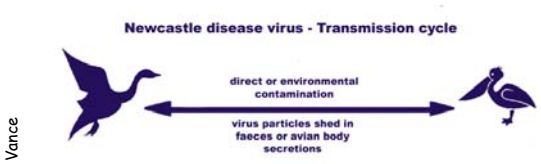
Recently, NDV was associated with significant mortality of double-crested cormorants as well as a few white pelicans and various gulls in prairie Canada and the Great Lakes region of Canada and the U.S. Newcastle disease virus also lives as a common and generally harmless inhabitant of rock doves (pigeons).



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Transmission Cycle

The method of transmission among wild birds is not known. Viral particles can survive and leave the bird in the faeces or in nasal/respiratory secretions. Once outside the body, the virus is resistant to a wide range of environmental conditions and is well-adapted to withstand freezing. As a result it can persist on nesting colonies or in wintering areas until birds return in spring or fall. Thus, it is not necessary and is unlikely that the virus is carried back and forth in migrating individuals. In most birds viral particles can be shed for a long time and thus continuation of the population of NDV is assured.

Transmission of any infectious agent that relies on direct contact or environmental contamination as a means of transfer to new hosts is improved in high-density populations. More birds equals more habitat for NDV, and the more crowded they are, the more opportunities for transmission to other birds.

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Distribution in Alberta

The NDV occurs on nesting colonies of cormorants, pelicans, and gulls at a few lakes in the vicinity of St. Paul and Lac la Biche. We know this because of the occasional outbreaks of mortality at these sites. The NDV likely occurs in other colonies but has not caused significant mortality or has gone undetected.

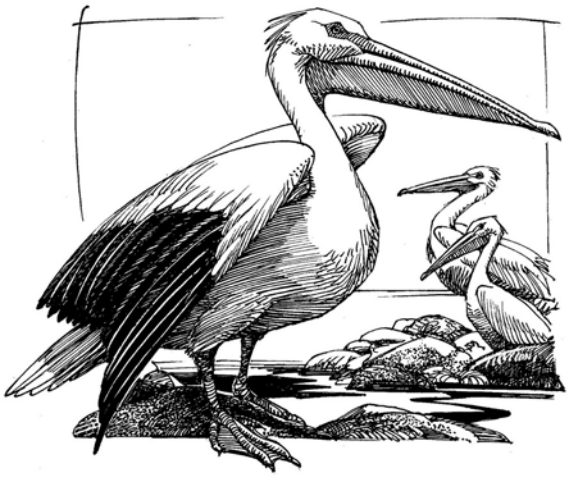
Importance for Wildlife Management

Cormorant populations in Alberta and throughout Canada and the U.S. increased markedly since the 1950s and currently provide abundant habitat for NDV. The virus was largely undocumented in cormorants until the early 1990s, when dead birds were found in Alberta, Saskatchewan and, perhaps, Manitoba. In 1995, dead cormorants were found throughout the Great Lakes region and again in the prairie provinces; however, the total estimated mortality was minimal relative to the large population of cormorants in these areas. The virus was detected in cormorants repeatedly through the late 1990s and early 2000s and current evidence suggests NDV occurs naturally in wild cormorants throughout their range in North America. Similarly, pigeons also provide suitable and abundant habitat for NDV.

Public Significance

Humans rarely provide suitable habitat for NDV. There are a few documented cases of conjunctivitis (mild eye irritation along with possible flu-like symptoms for up to 7 days) in workers at poultry slaughterhouses or laboratory technicians working with the live virus. Viral particles in the air are considered the source of these exposures. Persons picking up dead birds during NDV outbreaks should avoid wiping their eyes.

There are various strains of NDV, no doubt adapted to slightly different environmental conditions within birds or among different species of birds. Some strains are not well adapted to domestic poultry, particularly chickens and turkeys, and cause fatal infections in these species. Poultry producers have spent large amounts of time and money in an attempt to eradicate NDV from domestic flocks. Fortunately, the strain of NDV in wild birds generally is relatively well adapted to and is not lethal in poultry. However, free-range poultry may be at some risk if infected wild birds use the same watering sites. There is one documented case of transfer of NDV from cormorants to free-range turkeys in North Dakota and subsequent mortality of the turkeys.



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For more information on wildlife diseases in Alberta: http://www3.gov.ab.ca/srd/fw/diseases/index.html

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Prevention/Control

There is no known means of eliminating NDV in wild birds nor is there a valid reason to do so. It is likely that the virus occurs naturally in wild birds and is maintained as silent infections that do not cause death. Occasionally, outbreaks occur but they appear to be short-lived and kill limited numbers of colonial-nesting species.

Current management practice is to collect carcasses as a means of limiting contamination of nesting and wintering areas. Given that the strain of NDV in wild birds is not lethal to poultry and that current losses are minimal, further control of the virus is not necessary. However, it seems appropriate to use caution and avoid transferring NDV from colonial-nesting sites of wild birds to poultry farms.

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Summary

Newcastle disease occurs occasionally in cormorant colonies in east-central Alberta. Losses of wild birds and risk to domestic poultry are minimal.

Additional Information

Canadian Food Inspection Agency: http://www.bcvma.org/health/CFIA%20-%20Animal%20Health%20-%20Animal%20Disease%20Information.htm

Manitoba Agriculture, Food and Rural Initiatives: http://www.gov.mb.ca/agriculture/livestock/poultry/newcastle.html

Merck Veterinary Manual - Online: http://www.merckvetmanual.com/mvm/index.jsp?cfile=htm/bc/203800.htm&word=newcastle%2cdisease

For more information on wildlife diseases in Alberta: http://www3.gov.ab.ca/srd/fw/diseases/index.html

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