West Nile Virus in Wildlife

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Michigan DNR

West Nile Virus: Reservoir Hosts

Isolated from numerous wild birds.

- Wetland and terrestrial species.

Birds are primary amplifier hosts.

- Reservoir status not known.

Migratory birds have a role in the distribution and re-introduction of virus into northern latitudes.

Role of mammals is not known, but they appear to be dead end hosts.

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In the United States: USGS Data

194 Avian Species -

130 native/wild, 64 captive/exotic

(38 Antibody positive)

28 Mammalian Species –

8 wild, 20 captive

(7 Antibody positive)

2 Reptilian Species –

2 captive

(1 Antibody positive)

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In Michigan:

Corvid Avian Species

American Crow
Blue Jay
Common Raven

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In Michigan:

Non-Corvid Wild Avian Species

- Great Horned Owl
- Red-tailed Hawk
- Northern Goshawk
- Sharp-shinned Hawk
- Cedar Waxwing
- Ruffed Grouse
- Canada Goose
- House Finch
- Bald Eagle – diagnosed in Wisconsin

Photo Credit: Dave Kenyon DNR

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In Michigan:

Mammalian Species

Eastern Fox Squirrel

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Transmission Routes:

Naturally occurring -
Transmission via mosquito bite.

In captivity (research) –
Transmission via fecal or oral secretions.

Transmission via the eating of infected prey.

It has not been proven that these 2 types of transmission occur naturally.

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Clinical Signs:

Depression, anorexia (weight loss), dehydration, ataxia (loss of coordination), disorientation, inability to fly or use their legs, head tremors, eye twitching, apparent blindness, seizures/convulsions, abnormal head posture, circling, weakness, and death.

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Great Horned Owl diagnosed with WNV in 2002

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Post Mortem Examination

Many organs are affected by the virus but in most cases appear grossly normal.

The heart and kidney are collected for testing.

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Post Mortem Diagnosis

Corvid avian species necropsies are performed at MSU's Diagnostic Center for Population and Animal Health (DCPAH)

Non-Corvid avian species and mammalian species necropsies are performed at the DNR's Rose Lake Wildlife Disease Lab

Testing is performed at MSU's DCPAH

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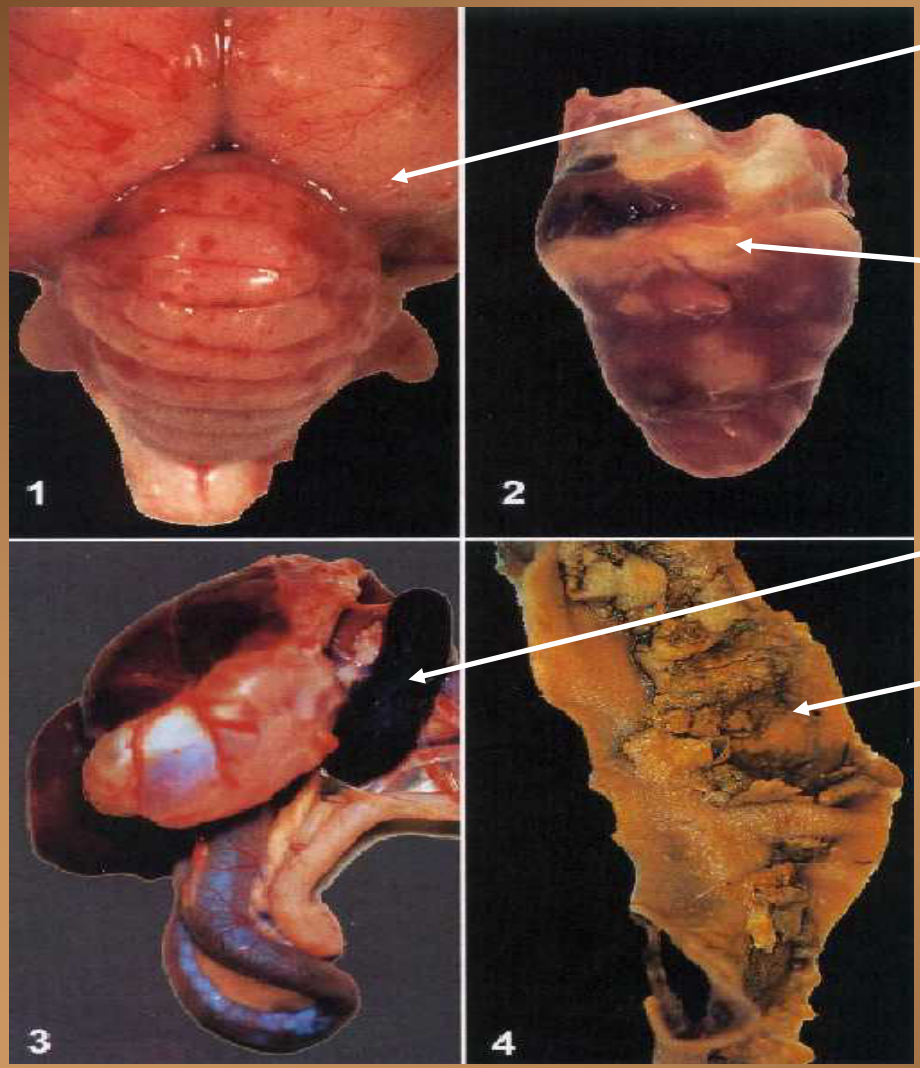
Gross Lesions

Gross lesions in birds are rare.



Brain showing petechial hemorrhages.

Heart with tan areas of myocardial necrosis and myocarditis.

Enlarged spleen.

Intestine with pseudomembranous or necrotizing enteritis.

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Impact on Wildlife:

Reports of lower numbers of various avian and mammalian species have occurred but there is no evidence that this is or is not due to WNV.

Appears avian populations may be impacted in isolated areas of the state, but not statewide.

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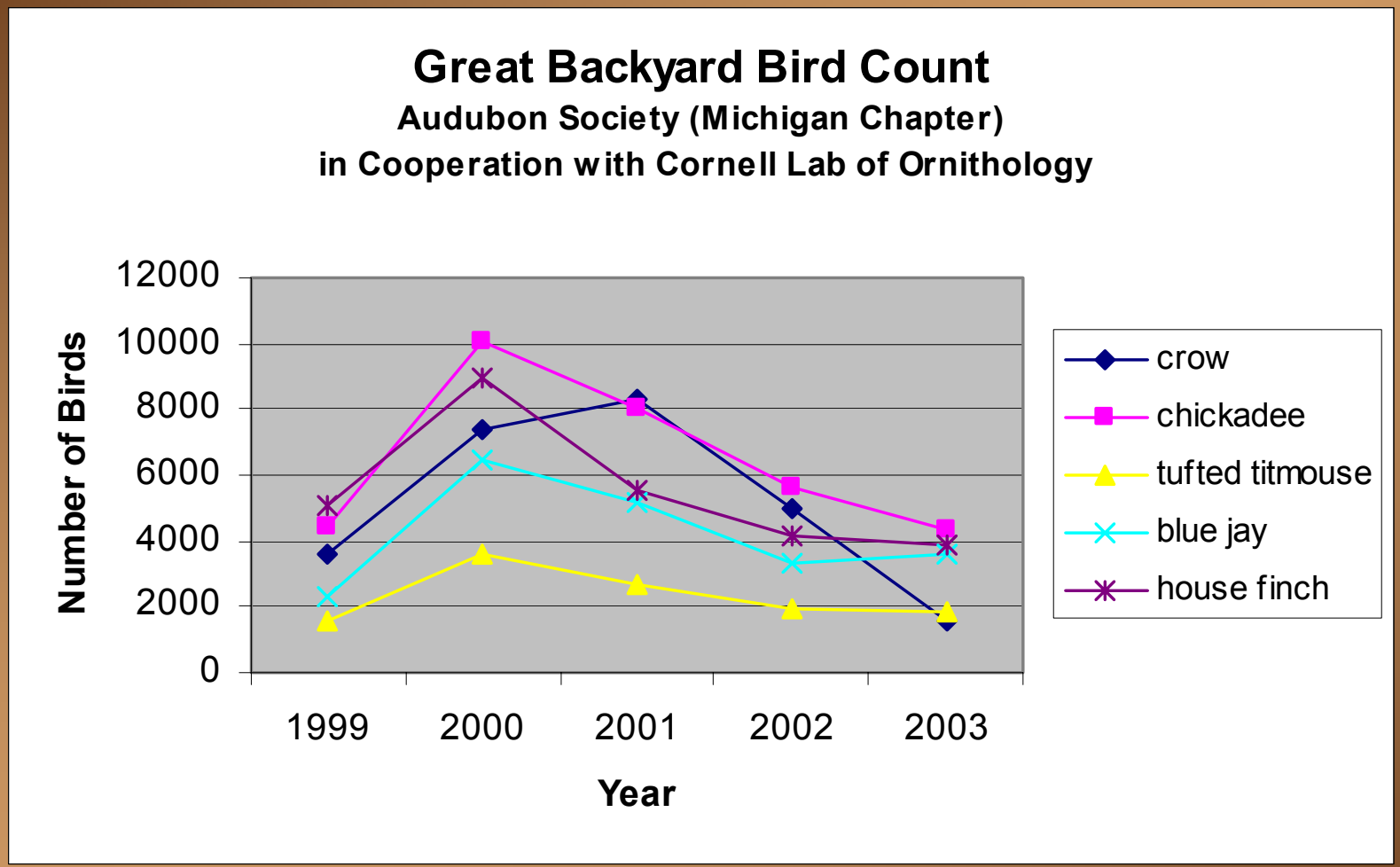
Impact on Wildlife:



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Impact on Wildlife:

WNV may cause chronic infection in birds that reappears during times of stress.

Birds may die of secondary organ damage in months or years following the initial infection.

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Impact on Wildlife:

WNV may spread to the subtropics where species are stressed by habitat destruction and where year-round mosquito transmission would be possible.

Endangered & threatened species may be impacted where the death of even a few individuals could be significant.

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Monitoring Impact on Wildlife:

Testing of birds and mammals with central nervous system signs.

Testing until at least 2 positives per species are found in the state.

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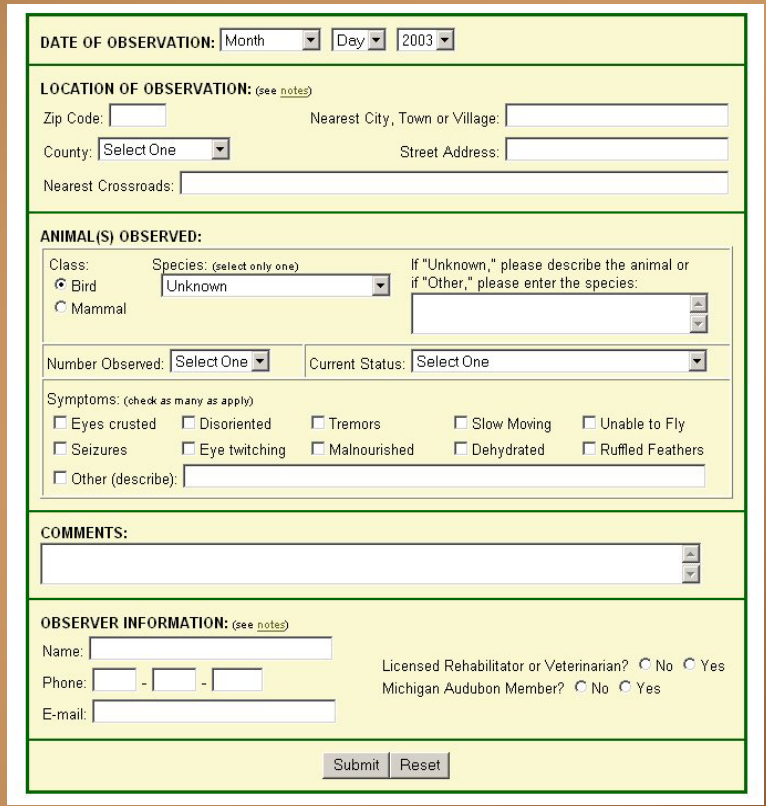
Monitoring Impact on Wildlife:

Web-based submission of data and posting of results.

Tables & graphs:

Summaries of dead bird and mammal reports.

Summaries of test results.



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The End

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