



**National Wildlife Health Center
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Avian Vacuolar Myelinopathy (AVM) Re-Emerging in 2000

To: Natural Resource/Conservation Managers
From: Director, USGS National Wildlife Health Center (Bob McLean)
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Pathologists at the USGS National Wildlife Health Center (USGS) in Madison, Wisconsin and the Southeastern Cooperative Wildlife Disease Study (SCWDS) at the University of Georgia have once again diagnosed "avian vacuolar myelinopathy (AVM)" in brains of mallard ducks and coots on Woodlake in North Carolina, coots on Lake Juliette in Georgia and coots, 11 suspect bald eagles and for the first time a Canada goose on Strom Thurmond Lake located on the border of South Carolina and Georgia. The disease had not previously been confirmed in Canada geese, although 2 suspect AVM cases from Strom Thurmond Lake were documented by SCWDS in 1999.

Vacuolar myelinopathy is a nervous system lesion, diagnosed by microscopic examination of very fresh brain tissue. In affected birds it appears as open spaces in the white matter of the brain. Using electron microscopy, scientists determined the spaces are caused by separation of the myelin layers that surround and protect the nerves.

AVM was first recognized in 1994 and 1996 in bald eagles and coots, respectively, at DeGray Lake, Arkansas. Since then, as a result of work by USGS and SCWDS, AVM has been confirmed or is suspected in coots on 11 lakes in 5 states (Arkansas, North Carolina, South Carolina, Georgia, and Texas), in bald eagles in 4 states (Arkansas, North Carolina, South Carolina, and Georgia), and also in several species of waterfowl (mallards, ring-necked ducks, bufflehead ducks and Canada geese). All the lakes where affected birds have been found are wintering sites for migratory populations, are man-made and vary in size, depth and surrounding land use. Since 1994, at least 70 eagle deaths have been attributed to AVM, including about a dozen eagles that were found alive and died within 24-48 hours.

Affected birds have erratic flight or are unable to fly, may crash land, swim tipped to one side with one or both legs or wings extended or be in the water on their back with their feet in the air. On land, birds stagger and have difficulty walking and may fall over unable to right themselves (appear intoxicated). Birds are usually alert and may bite when handled even if unable to escape capture. It remains unknown if the disease is "spreading" or if affected birds at other locations are recognized because more people are aware of the problem.

All diagnostic, field and laboratory efforts suggest the cause is most likely a chemical substance, either one that is naturally occurring or manmade. Tests have been negative for chemical compounds previously associated with vacuolar myelinopathy in other species. Route of exposure is not known at this time. Multiple agencies are continuing field, laboratory and research efforts to determine the cause of the disease.

USGS is conducting research on AVM using wing-clipped mallards and wild-caught coots in a sentinel study for the disease in North Carolina. So far the sentinel study has confirmed that the disease is site-specific, i.e. the lakes where birds are dying is the site of exposure. We have also determined that the time of onset is short, as soon as 5 days after placement on one of the lakes. Samples of water, vegetation, and sediments were immediately collected at the locations where mallards were observed to be feeding. Feeding trials are also underway to try and determine the route of exposure. Additional information related to on-going AVM research is available at the USGS-NWHC website at <http://www.emtc.usgs.gov/nwhchome.html>

There is no evidence that AVM affects mammals. The risk to humans is unknown, however, as with any sick wild animal, birds suspected of having AVM should be considered unfit for consumption. Our standard precautions are that

people handling any wildlife that is sick or died of unknown causes should do so with caution using waterproof gloves or an inverted plastic bag. Hunters should avoid shooting wildlife that are exhibiting unusual behavior, should use waterproof gloves when dressing out game, and should thoroughly cook meat before eating.

Wildlife managers are encouraged to observe coots, waterfowl and eagles and report any sick birds to [Kimberli Miller](#) at USGS National Wildlife Health Center at 608-270-2448/2400 or the Southeastern Cooperative Wildlife Disease Study at 706-542-1741. If any freshly dead birds are found, please keep carcasses chilled on ice or refrigerated, but not frozen, while you contact the above agencies.

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