

Microscopes

Case Study

The Department of Natural Resources received a call from a farmer saying he had found a dead American bald eagle while driving around his property. The American Bald eagle is the official symbol of the United States. They are a protected species. Causing the death of an American bald eagle can result in up to a \$100,000 fine. It is illegal to possess a bald eagle or its corpse. Each bald eagle death is investigated and the body recovered. The DNR sent an officer to the site to investigate the claim and collect the corpse.

The farmer led the officer to the eagle's corpse. He told the officer he occasionally saw eagles and ospreys in the area fishing in the farm's pond. The officer noted the eagle was found lying beneath power lines crossing the property. He did not see any overt injuries such as gunshot wounds. He collected the corpse for necropsy and also collected water and algal samples for testing.

The major causes of death for bald eagles are accidental injury, poisoning, gunshot wounds and electrocution. At necropsy it was determined that the eagle did sustain some injuries, but those were probably from the fall. The veterinarian confirmed there were no gun shot injuries. The bird did exhibit some signs of electrocution. Electrocution in birds occurs when they land on an electrical wire and then some other part of their body such as a wingtip or talon touches a different wire or other source of grounding. Further dissection revealed lesions in the eagle's brain. The veterinarian suggested that this eagle died of avian vacuolar myelinopathy or AVM. AVM has been noted as cause of death in eagles since the mid-1990s. Other animals (turtles, fish) in aquatic ecosystems can also contract AVM. AVM is caused by a toxin. The toxin is thought to be produced by the imported/exotic cyanobacterium (blue green alga) *Aetokthonos hyrillicola*.

This cyanobacterium grows under the leaflets of a common freshwater alga called hydrilla. While eagles don't eat algae directly, they do eat the water birds and fish that feed on hydrilla. The toxin produced by the cyanobacterium is said to bioaccumulate up the food chain, which means the top predators in any ecosystem accumulate the toxin by eating many or large masses of smaller organisms which have been ingesting the toxin. The toxin causes brain lesions which leads to neurological impairment which in turn can cause problems with walking, flying or swimming.

Water from the lake tested within normal ranges for all chemical parameters. The algae sampled from the edge of the lake was examined using a microscope (stereo microscope, compound light microscope). Hydrilla, several diatoms and a few different green algae were identified in the sample. *Aetokthonos hyrillicola* was detected on the underside of the leaflets of hydrilla.