

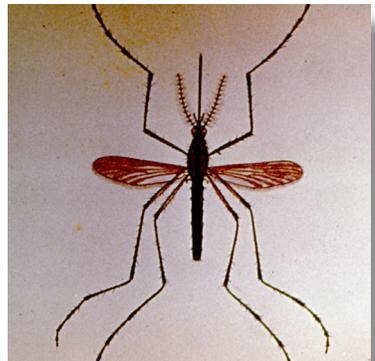
Patuxent Wildlife Research Center

A Vaccination Program to Protect Endangered Whooping Cranes from Encephalitis Virus



The Challenge: In eastern North America there is a viral disease called Eastern Equine Encephalitis, or EEE. This virus is transmitted among native bird species by the mosquito, *Culiseta melanura*, but does not cause disease in these passerine species. However, the virus is capable of causing severe disease or death in horses, some game bird species, humans and whooping cranes. In the fall of 1984 during an epizootic at the Patuxent Wildlife Research Center endangered species captive breeding facility, 21 of 39 whooping cranes (54%) were infected with the virus and of the 21 infected whooping cranes, 7 or 33% died.

The Science: Because EEE is a deadly disease for horses and humans, vaccines have been commercially available for a number of years. Human EEE cases are extremely rare and vaccinations are usually reserved for laboratory workers studying the virus and others in high risk situations. This is not the case for horses, where serious and often fatal disease outbreaks are possible, and several companies produce commercial equine vaccines. For whooping cranes, we initially found that the human vaccine provided superior protection as measured by antibody titers. However, starting in the early 2000's, the human vaccine became difficult to obtain and additional research with the currently available equine vaccines showed comparable protection, as measured by the antibody titers. Because whooping cranes are endangered birds, we cannot vaccinate them, and then challenge them with the EEE virus to assess their level of protection. However, because natural outbreaks of EEE are cyclical, we have been able to compare years of high levels of transmission by the mosquito with years of low transmission. To date only one young whooping crane has died of EEE in the captive population at Patuxent since the 1984 epizootic, thus demonstrating, through the means of natural challenge, that the vaccination program is efficacious.



The Future: We currently vaccinate all our whooping cranes to protect them from EEE. Each whooping crane chick gets its first vaccination at 35 days-of-age using a commercially available killed-virus equine vaccine. A booster vaccination is given 3-4 weeks later, and all adult whooping cranes receive annual re-vaccinations. We plan to continue to vaccinate all whooping cranes for EEE and, with the help of the Maryland Department of Agriculture, to monitor mosquito populations on the wildlife refuge. Periodically, as new vaccine products become available, we will test them to determine their level of protection when used with whooping cranes.