

Patuxent Wildlife Research Center

Pathogens in the Aquatic Environment – Waterfowl, Avian Influenza



The Challenge: Changes in aquatic ecosystems related to climate change phenomena or other anthropogenically based environmental stressors have significant impact on the dynamics of the host-pathogen-environment relationship, often with surprising results. Therefore, biosurveillance of the aquatic environment for pathogens of significance to aquatic and terrestrial wildlife, as well as to domestic animals and humans, is a focus area of increasing importance in ecosystems science. The study of avian influenza viruses in the aquatic environment is a suitable model for such biosurveillance-based investigations as the pathogen is both persistent in many aquatic reservoirs and highly significant to wildlife, poultry, and human health.



The Science: This work is a collaborative project with USGS Leetown Science Center (Dr. Christine Densmore) that aims to investigate the presence and prevalence of LPAIV in the aquatic environment on the Delmarva Peninsula, comparing:

- (1) Identification in distinct reservoirs within waterfowl habitat, such as sediment, waterfowl feces, or filter-feeding animals
- (2) Compare prevalence of LPAIV isolated from environmental samples to the prevalence of LPAIV isolated directly from wild aquatic bird populations occupying the same habitat.
- (3) Determine and compare the subtypes of LPAIV present in these habitats isolated from both waterfowl and environmental reservoirs.



The Future: This project could effectively serve as a pilot study to evaluate the potential efficacy of this biosurveillance methodology. Further study throughout Delmarva could follow to apply these methods throughout various waterfowl habitats. Determination of the significance of isolation of LPAIV from different reservoirs related to site-specific environmental variables (water quality and characteristics, habitat specifics, flora and fauna, etc.) could thereby also be determined through future biosurveillance efforts.