

OFFICE OF FISH AND WILDLIFE HEALTH AND FORENSICS
MONTHLY REPORT
July 2021

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FISH AND WILDLIFE HEALTH PROJECT (FW-69-R20)

Diagnosis of Diseases in Freshwater Fish (Job F-1)

Hosting the annual Northeast Fish Health Committee / Fish Culture Chief Meeting:

Dr. Lovy is the current Chair of the Northeast Fish Health Committee and planned this year's annual meeting, which is held in virtual format on July 21 – 22. The agenda has various speakers to present about regional fish health issues and projects.

Diagnosis and research of Diseases in Marine Fish (Job F-2)

Myxozoan parasite diversity in NJ river herring:

A report was finalized that documents myxozoan parasites in river herring populations. Fish health information is required to best understand how to conserve this species. Results from 2014 – 2018 were summarized and showed that myxozoan parasite infection varied depending on the life stage of the fish and habitat from which it was sampled from. Three myxozoan parasites infect young-of-the-year river herring, including *Kudoa clupeiidae* infecting the muscle, *Myxobolus mauriensis* infecting the ribs, and a coelozoic myxozoan which is non-pathogenic. Adult spawning fish returning to rivers are infected with an *Ortholinea*-like myxozoan in the kidney. It is believed this parasite is not pathogenic due to the lack of pathology associated with infection. Though there are diverse myxozoans in anadromous river herring, no myxozoans were documented in landlocked populations of Alewife, suggesting the importance of the river habitat in the ecology of myxozoans. This work was submitted to the journal "Parasitology Research".

Black Sea Bass sampling for viral nervous necrosis virus (July 2021):

Black Sea Bass were collected in collaboration with the Bureau of Marine Fisheries, Artificial Reef Project, to survey for viral nervous necrosis virus (VNNV). This virus is known to impact a wide range of marine fish species, and fish in the grouper family are believed to be particularly susceptible. In 2020, we detected the virus using PCR in a single fish. This surveillance is continuing to understand the distribution and prevalence of VNNV in New Jersey. Additionally, for any detections of the virus, we are sequencing the viral genome to understand the genotype present in this region. A total of

60 fish were sampled from the Little Egg Harbor Reef on 08 July 2021 and an additional 58 fish from the Sea Girt Reef were sampled on 15 July 2021. Dr. Lewis assisted with the sampling of these fish. Biological data, including total length, weight, and sex were recorded. Otoliths were collected for future aging of the fish. Brain tissue was sampled for VNNV screening by real-time PCR. Samples are stored at -80°C and will be evaluated in the future.

Red Grouper submitted to the laboratory:

Several diseased Red Grouper that were maintained in a captive population in the state were submitted to the laboratory. The most common finding was ulcerated skin lesions in the infected fish. Microscopic examination of skin scrapings showed a heavy infection with a marine oomycete fungus, consistent with a marine variety of *Saprolegnia*. The skin lesions were also frequently heavily overgrown with bacteria. Bacterial cultures showed the presence of *Vibrio harveyi* isolated from the margin of the skin lesion and *Morganella morganii* lightly isolated from the kidney. Identification of two other bacterial isolates is currently pending. The oomycete fungus is likely ubiquitous in aquatic environments and the isolated bacteria are considered common in marine environments and may persist in the gastro-intestinal tract of healthy fish.

Wildlife Disease Surveillance and Investigations (Job W-1) and Wildlife Toxicology (Job W-2)

New Cases:

Red-tailed hawk, Morris NJ:

Raptor Trust received this hawk after it was hit by a vehicle. They were suspicious it had been poisoned first. The hawk was brought to the Clinton Pathology Lab for necropsy. No obvious signs of trauma or disease were seen on necropsy. The liver was collected for rodenticide testing, results are pending.

Multiple dead fledglings:

Beginning in late May health officials began receiving reports of hatchlings and fledglings in the Washington DC, Virginia, West Virginia area with ocular lesions, such as crusting and swelling, and neurological issues. In the following weeks, more states were beginning to see similar issues, including NJ. Birds were collected and examined; histology is pending. Various viruses (such as Avian Influenza and Newcastle), bacteria (such as Salmonella and Mycoplasma), parasites, pesticides, and herbicides, have all been ruled out. Ongoing genomics studies as well as evaluation of the potential involvement of the cicada fungus is pending and more information will become available in the coming weeks. Residents have been asked to report any findings of sick or dead fledglings or hatchlings to Dr. Lewis, with future mapping of this incident planned.

Red-tailed hawk, Chatam Twp, NJ:

Raptor Trust received the bird and could not do a full exam as the bird was seizing. The bird was treated but died within 24 hours. It was then transported to the Clinton

Pathology Lab for evaluation and was suspected of poisoning. On necropsy there was no evidence externally of trauma and internally there were intestinal worms (incidental finding) and some hemorrhage in the skull. The liver was collected for rodenticide testing, results show Brodifacoum at approximately 0.040 ppm (0.010 ppm detection limit) and Difethialone at approximately 0.060 ppm (0.050 ppm detection limit).

Cottontail Rabbits, Margate NJ:

There had been multiple reports recently of rabbits dying in Margate. Two most recent were collected and transported to the Clinton Pathology Lab for evaluation. On necropsy the rabbits appeared to have been victims of predation. The rabbits were also tested for Tularemia and Rabbit Hemorrhagic Disease Virus, both of which were negative.

Piping Plover, Stone Harbor Point, NJ:

Staff reported a Piping Plover adult that had an injury to the right side of its face. The bird ultimately died from its wounds and was transported to the Clinton Pathology Lab for necropsy. On examination there was a small hole in the right side of the face. Tissues were collected for histology and showed a pneumonia along with severe hemorrhage in the lungs and there were also inflammatory cells in the eye on the same side as the wound. It was determined that the bird was likely attacked by a predator and developed an internal infection stemming from the wound to its face.

Crow, Cinnaminson, NJ:

A resident contacted USDA WS about a crow that was severely neurologic on her property that ultimately died. The resident sent video of the incident, which showed the crow rolling and falling over. The bird was collected and transported to the Clinton Pathology Lab for necropsy. On examination there was hemorrhage in the coelomic cavity under the sternum as well as hemorrhage in the skull, all likely related to trauma from falling. The spleen appeared reddened and enlarged and there were 2 pinpoint tan nodules in the liver. The bird was tested for West Nile Virus and EEE and was found to have West Nile Virus. The Mosquito Commission and the Department of Health were notified of the findings.

Great Blue Heron, Essex, NJ:

Raptor Trust contacted Dr. Lewis regarding two Heron that were brought to their facility with neurologic signs. This one died within 24 hours of being in the facility. Externally this bird had no signs of trauma. Internally the ventriculus (gizzard) was thickened and had multiple abscesses throughout. The rest of the necropsy was unremarkable. Additional diagnostics are pending.

Great Blue Heron, Somerset, NJ:

The second heron from Raptor Trust was euthanized upon its arrival due to its condition. Internally the pericardial sac (sac surrounding the heart) was filled with a straw-colored fluid. There were no other findings on necropsy. Additional diagnostics are pending.

Red-tailed Hawk, Passaic, NJ:

Raptor Trust submitted the hawk for necropsy as a suspect poisoning case. The hawk had a degloving injury of its right leg as well as an open wound on its head. After several attempts at treating these wounds, they would not heal. The bird was euthanized. On examination, internally, there were no significant findings. The liver was collected for rodenticide testing. Bromadiolone was detected at approximately 0.050 ppm (0.025 ppm is the detection limit).

Red-tailed Hawk, Somerset, NJ:

Raptor Trust submitted the hawk for necropsy as it was brought to them deceased and suspected of poisoning. Externally there was a significant number of flying insects within the feathers. Internally, there was an extensive aspergillus infection impacting most of the air sacs as well as several internal organs. Liver was also collected for rodenticide testing which showed Brodifacoum at approximately 0.110 ppm (0.010 ppm detection limit), Bromadiolone at approximately 0.110 ppm (0.025 ppm detection limit), and traces of Difethialone detected.

Meetings:

- Dr. Lewis participated in a multistate conference call regarding the ongoing songbird mortality event to discuss findings and ongoing testing as well as messaging.

NON-PROJECT ACTIVITIES:

Shellfish Health Project:

A project has been initiated with the Bureau of Shellfisheries, which is being partially funded by the USDA-APHIS. The goals of this project are to conduct pathogen surveillance to better understand the range/levels of shellfish pathogens along the coast of New Jersey.

Last month, sample collection has been completed in hard clams *Mercenaria mercenaria* for a disease known as hemocytic neoplasia. Histologic evaluation is underway to screen clams for hemocytic neoplasia and QPX caused by *Muchochytrium quahogii*.

This month, sampling for oysters has been initiated. This project is intended to conduct surveillance for the main oyster pathogens (dermo disease, MSX, SSO, and Bonamia) along the coast of NJ. This project will complement the work done by the Rutgers Haskin Shellfish Lab in the Delaware Bay. Five sites have been identified for 2021 surveillance. Sampling from the first location (Ludlam Bay) occurred on 19 July 2021. Sampling included taking tissues for dermo cultures, histology, and multiplex PCR which can detect dermo, MSX, and SSO. The multiplex PCR will be conducted at the Animal Health Diagnostic Laboratory, NJ Department of Agriculture. Histology and cultures are being done at the Pequest Aquatic Animal Health Lab. Results from these samples are pending.

- Dr. Lovy reviewed a manuscript for the Journal of Fish Diseases.

Suspected shooting of a White-tailed deer:

A forensic necropsy was performed on a deer that was suspected to have been shot illegally outside of season. It was determined that the deer had a puncture wound from impalement and was not an illegal hunting incident.

Suspected illegal shooting of a Black Bear:

A forensic necropsy was performed on a black bear that had been illegally shot. A bullet was retrieved and relinquished to the investigating officer.

Spotted Turtle Sampling for Genetics:

Dr. Lewis assisted Brian Zarate as well as a veterinarian from the Camden Aquarium and several vet techs and ENSP technicians in sampling previously confiscated turtles for genetics to determine where these turtles originated from as part of an ongoing repatriation effort.

- Dr. Lewis continues to attend biweekly COVID19 One Health calls with state, federal and tribal partners hosted by CDC.
- Dr. Lewis participated in a Wood Turtle monitoring call with Brian Zarate and counterparts in PA.
- Dr. Lewis participated in a call to continue planning for the release of a Terrapin in the coming fall
- Dr. Lewis met virtually with an intern working with USDA APHIS this summer to introduce him to her role as a wildlife veterinarian as he is interested in attending veterinary school soon