# OFFICE OF FISH AND WILDLIFE HEALTH AND FORENSICS
# MONTHLY REPORT
# May 2021

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

Histology equipment purchasing:

A Leica ST5010 autostainer has been installed in the Pequest Aquatic Animal Health Laboratory. Training on the equipment is scheduled to occur towards the end of May. A second piece of equipment (Leica CV5030 coverslipper) has been ordered and is expected to arrive in over a month. These two pieces of equipment are a significant improvement to the work-flow for processing histology samples in the laboratory.

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

Mortality of Brook Trout and other species in Stewartsville, NJ update:

On April 13th, 2021 a fish kill was reported in a small tributary in Stewartsville, Warren County, which is an outflow of Merrill Creek Reservoir. This was an acute mortality that occurred within one day. Upon investigation by the Bureau of Freshwater Fisheries, it was confirmed that multiple species were affected including Brook Trout, Blacknosed Dace, and Creek Chub. Five freshly dead Brook Trout were collected by conservation law enforcement and submitted to the Pequest Aquatic Animal Health Laboratory. The Brook Trout ranged in size from 12-21 cm weighing between 17 and 113 grams. Along with the wide size range, the sexes of the five fish were, one female, one male, and three juvenile fish. No gross lesions were observed in necropsy; two fish had noticeable acanthocephalan worms in the digestive tract. Histopathology did not show any lesions suggestive of an infectious disease or chronic insult. Spleen and kidney tissues were submitted for virology to screen for viruses of concern, including infectious pancreatic necrosis virus (IPN). The samples were screened on two cell lines (EPC and CHSE-214) incubated at 15 degrees C. These samples were negative for viruses of concern.

Due to the subacute nature of the mortality, multiple species being impacted, and the lack of signs of an infectious disease, this mortality was most likely the result of an environmental issue. Based on reports, this stream was very small with relatively low water flow. Dissolved oxygen was not expected to be a problem with the cool water temperatures. A pool supply company was observed nearby. Fish are highly intolerant of chlorine, thus it is possible if chlorine was introduced into the water then it could cause a mortality. Chlorine toxicity could not be evaluated in these samples, thus the cause of this mortality is unknown at this point.

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

Black Sea Bass sampling with Bureau of Marine Fisheries (21-Apr-2021):

Black Sea Bass, collected during the artificial reef survey in Sea Girt Reef by the Bureau of Marine Fisheries, were submitted to the Pequest Aquatic Animal Health Laboratory. These fish are part of a survey to generate data on a copepod parasite, *Lernaeenicus radiatus* (anchor worm) and to screen for viral nervous necrosis virus (VNNV), a marine virus of concern that infects a wide range of marine finfish. Further, size and sex were documented in the fish. Otoliths were collected for future aging of fish. This fish health and biological data will complement the Bureau of Marine Fisheries data on the biology of Black Sea Bass on the coast of NJ. In addition, muscle samples were collected from all fish and saved in the -80 freezer for future analysis by the DEP Office of Science for toxins of concern (mercury and PCBs). Analyses of samples are pending.

Atlantic Menhaden mortality in the Raritan Bay and Delaware Bay areas- follow-up

Menhaden mortality first was reported on March 25$^{th}$ and has continued to the present. Based on an earlier investigation on March 30$^{th}$, it was confirmed that the mortality was associated with a bacterial infection, *Vibrio anguillarum*, in the fish. Fish are infected with particularly high bacterial loads in the brain, which is believed to cause the circling and erratic swimming behavior of the fish.

This month, several follow-ups were conducted in Natco Lake, Navesink River, and Shrewsbury River to determine if the cause of mortality remains the same. A total of 12 fish were collected on April 22 (6 fish from Natco Lake and 6 fish from the Navesink River). On April 26$^{th}$ a survey was conducted by boat to assess the mortality and to collect fish. An additional 20 fish were collected for examination in the lab (10 from Navesink River and 10 from Shrewsbury River). Lastly, both the Navesink and Shrewsbury Rivers were evaluated on May 12$^{th}$. On May 12$^{th}$ a total of 6 fish were collected. Moribund fish were more difficult to find indicating that the mortality has subsided and is likely nearing a conclusion. In addition to this, on May 17$^{th}$ moribund Atlantic Menhaden (n = 7) were collected from the Delaware Bay by the Bureau of Marine Fisheries. Evaluation of these fish found similar findings as those from the Raritan Bay area.

*Vibrio anguillarum* was confirmed from the fish and is believed to still be the main cause for the mortality. Additionally, a second bacterium, *Yersinia ruckeri*, was isolated from a smaller number of fish. The role of *Y. ruckeri* in this mortality is yet to be determined. The more sporadic isolation of this bacterium from the fish indicates that it may have a more minor role in the mortality. Though from fish samples collected in May, a small number of fish were infected only with *Y. ruckeri* indicating that it may play a role in the latter part of the mortality. The finding of *Y. ruckeri* in these fish is of interest, since this is a bacterium of concern in trout and other salmonids. *Yersinia ruckeri* is the cause of enteric redmouth in trout and to date has not been documented in the state.

A collaborative team has been assembled to research the bacterium associated with the menhaden mortality alongside our office. This includes Stony Brook University, which has collected fish in conjunction with the NYDEC to collect bacterial isolates from NY, USGS Eastern Ecological Center, which is working on genetic aspects of the mortality, and the USDA ARS, which is working on genetic aspects of *V. anguillarum*

and *Y. ruckeri*. Work is pending on this project. Preliminary results indicate that the V. anguillarum isolates from different locations share similar protein profiles, indicating that it may be related to a single strain/serotype of bacterium. Further analyses are pending. The final results of this work will be published in the future.

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

**Updates from previous cases:**

Starlings, Oceanport, Monmouth Co, NJ:
Fifteen starlings were presented for necropsy, all had signs of trauma to varying degrees. Six were examined on necropsy with no other gross findings noted. No findings were seen on histology. Cause of death was determined to be trauma.

White-tailed deer, Parsippany, NJ:
Final findings included CWD testing was negative, and histology determined a parasitic pneumonia with parasitic intestinal overburden as well as heart failure.

Raccoons, Wharton, NJ:
Local PD have noted that multiple (close to 20 raccoons) have died in that area over the last 2-3 months. The three raccoons examined were found to be positive for distemper.

**New Cases:**

Red-tailed hawk, Maywood Borough, NJ:
Hawk was brought to the Clinton Pathology lab from Raptor Trust as a suspect poisoning. Testing determined the bird died from rodenticide toxicity.

Great-horned owl, Ringoes NJ:
A great-horned owl was brought to the Clinton Pathology Lab by Raptor Trust as another suspect poisoning. Results show traces of two different rodenticides but minimal. There was evidence of trauma on necropsy and samples were collected for histology. Results are pending.

Clapper Rails, Stone Harbor, Cape May, NJ:
Five clapper rails were found dead along the point at Stone Harbor. The birds were frozen and then transported to the Clinton Pathology Lab for examination. Necropsy showed evidence of predation in all birds examined as the cause of death.

Red-shouldered hawk, Marlboro, NJ:
Raptor Trust transported the hawk to the Clinton Pathology Lab for evaluation. No findings were not on necropsy and rodenticide testing is pending.

Red-tailed hawk, Pottersville, NJ

A red-tailed hawk was brought to the Clinton Pathology Lab by Raptor Trust as they suspected another poisoning. On necropsy the hawk had aspergillus in the air sacs and numerous intestinal parasites were seen. Samples were collected for histology and additional testing. Results are pending.

Laughing gulls, Stone Harbor, NJ:
Nine laughing gulls were found dead on the beach in a small area. There was no evidence of inappropriate hunting on any of the gulls. Necropsy of 3 of the gulls was done (3 others were too far decomposed and the remainder were frozen). Internally, there was some evidence of trauma. Tissues were collected for histology and additional testing. Results are pending.

Meetings:

- Dr. Lewis attended a virtual meeting of the Northeast Section of the Wildlife Society.
- Dr. Lewis attended a virtual demonstration of a CWD visualization tool created for the PA Game Commission that could be retrofitted to be used by the division.
- Dr. Lewis attended and presented recent work on blood lead levels in black ducks in New Jersey pre- and post-lead ammunition ban at the virtual NEAFWA symposium.
- Dr. Lovy attended the virtual monthly animal health meeting hosted by the NJ Department of Agriculture.

**NON-PROJECT ACTIVITIES:**

Shellfish molecular diagnostics:
Work was done in collaboration with the NJ Department of Agriculture to adapt a protocol for a molecular diagnostic assay that tests for three oyster pathogens (dermo disease, MSX, and SSO). A plan was organized to test oysters using traditional approaches to compare to this molecular assay.

Bald Eagle, Philipsburg, NJ:
A bald eagle was found dead in the Philipsburg area near a railway. The eagle was transported to the Clinton Pathology Lab for examination. Necropsy showed evidence of extensive internal trauma. It was determined that the eagle was hit by a train.

Red-tailed hawk, Bergen Co, NJ
The red-tailed hawk was transported to the Clinton Pathology lab from Raptor Trust. Necropsy revealed that the bird died from electrocution.

- Dr. Lewis continues to attend biweekly COVID19 One Health calls with state, federal and tribal partners hosted by CDC.
- Dr. Lewis attended a virtual meeting to coordinate the future repatriation of a captive terrapin.
- Dr. Lewis performed disease sampling on wild wood turtles as part of a repatriation project for several captive wood turtles.