

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

Jan Lovy, Ph.D., Research Scientist II
Nicole Lewis, M.S., D.V.M, Research Scientist II
Sarah Friend (*on leave*), M.S., Environmental Specialist
Tesia Lin, B.S., Seasonal Technician

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

Histology equipment purchasing:

The histology laboratory requires an autostainer and coverslipper to improve workflow in processing histology samples. A Leica ST5010 Autostainer has been ordered. Further work is being done to identify a vendor for the purchase of a histology coverslipper CV5030.

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

Northern Pike broodstock virology testing for Hackettstown Fish Hatchery:

Northern pike broodstock were collected by the Hackettstown Fish Hatchery staff in Budd Lake. Ovarian fluid samples were taken from fish and are being screened for viral fish pathogens including IPN, VHS, SVC, and LMBV. Samples are currently being incubated on three cell lines at the Animal Health Diagnostic Laboratory, NJ Department of Agriculture.

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

Mortality of Black Sea Bass held in captivity (09 Apr 2021):

Wild collected adult Black Sea Bass being held in a captive research collection were reported to be experiencing increased mortality. This was a chronic mortality over a one-month period. Fish were lethargic, darkened in color, and had swollen eyes. Moribund fish were collected and euthanized with an overdose of buffered MS-222 and transported to the Pequest Aquatic Animal Health Laboratory. Gross findings during necropsy included bilateral exophthalmia (both eyes bulging), which under closer examination was related to an accumulation of gas causing increased pressure in the eye. Gas bubbles were also noted in the eye. Other internal organs were all within normal ranges based on gross necropsy. Organ samples were collected for future histopathologic evaluation and tissue samples collected to screen for viral nervous necrosis virus (VNNV). Necropsy indicates that fish died of “gas bubble disease” caused by gas supersaturation of the water within the tank. Supersaturated water may occur when cold water is quickly warmed and the excess gas is not dissipated prior to exposure to the fish, or if water is heavily agitated causing excess gas to be dissolved into the water. The excess gas within the water may form gas bubbles in the blood vessels and the gas may

accumulate within the eyes of fish. It is expected that if the source of gas supersaturation in the water is identified, then this condition should be remedied.

Atlantic Menhaden mortality in the Raritan Bay area (30 Mar 2021):

First reports of mortality in Atlantic Menhaden were received around March 25, 2021 in Natco Lake within the Raritan Bay area. This was investigated on March 30, 2021. Observations confirmed dead and dying Atlantic Menhaden. The affected fish were lethargic or were swimming disoriented, often circling at the surface of the water. Observations in Red Bank, NJ in the Navesink River also confirmed an ongoing mortality event with similar behavior in the fish. Observations from Natco Lake indicated that this is an active mortality that affected hundreds to a thousand fish, based on a rough estimate. A total of 12 moribund fish were collected for laboratory examination (5 from the Navesink River and 7 from Natco Lake) and were transported to the Pequest Aquatic Animal Health Laboratory for necropsy. As of April 19, 2021, observations and reports from the public indicate that this mortality is still ongoing.

Gross necropsy: Necropsy was completed on all 12 fish on March 30. Gross findings showed external hemorrhagic lesions on the head and sides in 8 of 12 fish. Internally, the fish had hemorrhage and congestion in the brain, enlarged spleens, and rarely petechial hemorrhage in the liver. Fluid (ascites) was noted in the body cavity. The internal organs were collected and fixed for histopathologic evaluation. The results of histopathology are pending.

Bacteriology: Bacteriology was conducted on all 12 fish onto two types of bacterial media, tryptic soy agar (TSA) and brain-heart infusion (BHI) agar supplemented with 2% Sodium chloride. Bacterial cultures were taken on both media types from brain and kidney of each fish and incubated at 20°C. Bacteria were isolated on both media types from both brain and kidney from 11 out of the 12 fish within 48-72h of incubation. Representative isolates of these bacteria were identified by MALDI-TOF (matrix assisted laser desorption ionization-time of flight mass spectrometry) and using the Trek diagnostic system at the Animal Health Diagnostic Laboratory, NJ Department of Agriculture. The predominant bacterial type that was isolated from the fish was identified as *Vibrio anguillarum*. Molecular samples have been collected from these isolates to complete a genetic analysis to better characterize the bacterium. This work is being done in collaboration with the USGS Eastern Ecological Science Center in Leetown, WV. Molecular results are pending.

Conclusions: This ongoing mortality event is similar to the November/December mortality from 2020 that occurred in the Raritan Bay area. The mortality and clinical signs of fish (circling at the water surface and other neurologic signs) occurred in both mortality events. Laboratory results confirmed that fish are suffering from vibriosis, caused by the bacterium *Vibrio anguillarum*. Systemic infection, particularly impacting the brain of the fish is the likely cause for the neurologic signs observed in affected fish. *Vibrio anguillarum* is a common bacterium in the marine environment and outbreaks are believed to be initiated by certain environmental stressors. These mortalities have been occurring in the spring and fall, when water temperatures highly fluctuate. It is possible

that cool and fluctuating water temperatures, which are known to be immunosuppressive in fish, are one of the possible stressors initiating these bacterial epizootics in the menhaden population. Further, with Atlantic Menhaden forming dense schools, transmission of the bacterium is likely enhanced from fish to fish due to their close contacts. This is a preliminary report and further laboratory work is being done to genetically characterize this bacterium to see how it compares to other known isolates that cause disease in fish. Further work is needed to understand the range of environmental factors that contribute to these bacterial epizootics and mortality events.

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

New Cases:

Starlings, Oceanport, Monmouth Co, NJ:

Resident contacted Animal Control in Monmouth Co stating that a large number of starlings were found dead on her property and near the road. The birds were collected and transported to the Clinton Pathology Lab for necropsy. 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. Histology is pending.

Great Horned Owl, Union City, Scotch Plains NJ:

Raptor Trust contacted Dr. Lewis with a Great Horned Owl that appeared neurologic and fell out of a tree. It was treated for two days for seizures until it was found dead in its cage on 3/22/21. The owl was transported to the Clinton Pathology Lab for necropsy. Externally there were no signs of trauma and the owl was in excellent body condition. Necropsy did not reveal any abnormal findings. Rodenticide testing found brodifacoum at 0.320 ppm, traces of Chlorophacinone and Difethialone at 0.060 ppm. The cause of death was rodenticide poisoning.

White-tailed deer, Parsippany, NJ:

Resident contacted USDA WS with a video showing an emaciated deer exhibiting neurological signs. Local PD went to dispatch the deer, but it was already deceased when they arrived. The deer was then transported to the Clinton Pathology Lab for examination. The 3.5+ year old doe was found to be emaciated. She had a severe overburden of nasal bots. There were lung adhesions and hemorrhage in the lung lobes. The liver was enlarged and rounded and there was a stricture in the small intestine with wall thickening and hemorrhage and straw-colored fluid in the abdomen. CWD testing was negative, additional testing is pending.

Raccoons, Wharton, NJ:

Local PD have noted that multiple (close to 20 raccoons) have died in that area over the last 2-3 months. Two died between April 17-18th and were transported to the Clinton Pathology Lab for necropsy. The offices that dispatched the animals said that some appeared sick, but others just appeared to have lost their fear of humans and would sit in the road and not respond to the rabies pole. Results are pending.

Meetings:

- Dr. Lewis meet virtually with a student from Georgia that is working with AFWA on a project with regards to Rabbit Hemorrhagic Disease response
- Dr. Lewis attended a virtual meeting of a newly formed Seabird Mortality working group and took the minutes.
- Dr. Lovy attended the virtual monthly animal health meeting hosted by the NJ Department of Agriculture.

NON-PROJECT ACTIVITIES:

Bald Eagle, Round Valley Reservoir, NJ:

A bald eagle was found dead next to Round Valley Reservoir and transported to the Clinton Pathology Lab for necropsy. Due to extensive decomposition and an overabundance of maggots no cause of death could be determined.

Red-bellied cooter sampling and necropsy:

As part of the ongoing investigation of the cause of the shell disease being seen in both Elmer and Daretown Lakes in Red-bellied cooters staff collected samples from approximately 20 turtles (4 from Daretown and 16 from Elmer) for additional testing. Multiple turtles from Elmer were found to have significant shell lesions. One turtle was found deceased and taken to the Clinton Pathology Lab for necropsy. There was a shell lesion on the plastron that extended into the body cavity. Samples were collected for histology, results are pending.

- Dr. Lewis continues to attend biweekly COVID19 One Health calls with state, federal and tribal partners hosted by CDC
- Dr. Lewis participated in a virtual meeting to discuss the potential of BSaI sampling in and house testing in salamanders
- Dr. Lewis attended a virtual meeting on Terrapin Research
- Dr. Lewis participated in a virtual "Careers in Government" Class for Rutgers students
- Dr. Lewis attended virtual seminars on rabies, One Health and wildlife contraception
- Dr. Lovy completed a scientific manuscript review for the journal "Aquaculture Reports".