Turtle Fraservirus 1

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CAUSE

Turtle fraservirus 1 (TFV1) is a newly characterized, negative-sense RNA virus in the genus *Fraservirus* and family Tosoviridae that affects aquatic animals. It was previously referred to as turtle bunyavirus (TBV).

DISEASE SIGNIFICANCE

TFV1 has been associated with severe disease and mortality events in multiple freshwater turtle species in Florida since January 2018. While the population-level impacts of this disease are not yet clear, freshwater turtle species are threatened by additional infectious diseases, as well as habitat loss and illegal collection for trade, making this an important pathogen for ongoing surveillance and research. The Florida Fish and Wildlife Conservation Commission (FWC) is conducting ongoing work to better understand this disease.

HOST SPECIES

To-date, TFV1 has been detected in five turtle species in Florida: Florida softshells, peninsula cooters, Florida red-bellied cooters, pond sliders (yellow-bellied sliders and red-eared sliders), and common snapping turtles. It is suspected that related turtle species may also be susceptible.

GEOGRAPHICAL DISTRIBUTION

The current confirmed distribution of TFV1 is limited to the following 10 Florida counties: Brevard, Collier, Indian River, Lake, Monroe, Orange, Osceola, Polk, Putnam, and Seminole. However, sick and dead turtles have been reported across the state of Florida and in neighboring states along the Gulf Coast, and the full range of TFV1 within and beyond the state is unknown.

TRANSMISSION

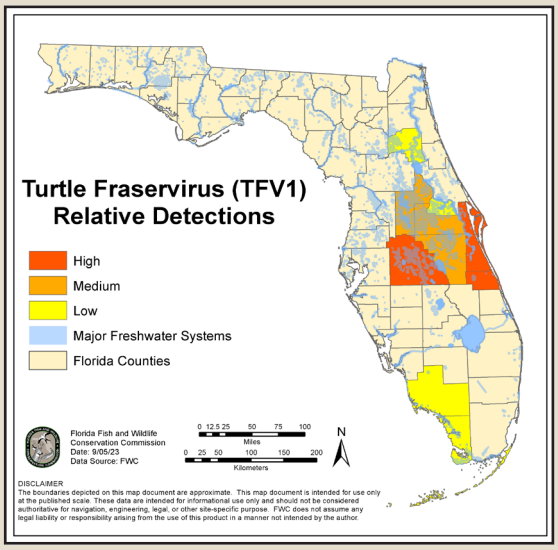
While the route(s) of transmission of TFV1 are still unclear, it is suspected that the virus is passed between animals through contact. TFV1 has been detected in multiple visceral organs, as well as the brain, and detection of virus in the kidneys and the urine suggests that shedding of virus in the urine may contribute to transmission. Transmission via vectors, such as leeches and mosquitoes, is also being explored as a possibility. The virus has been detected in both adult and immature turtles, and disease events are more commonly detected in winter and spring months.

FIELD SIGNS

Clinical signs of TFV1 may include all or some of the following: weakness, lethargy, swollen, closed or sunken eyelids, discharge from the nose or eyes, and splotchy red discoloration (especially on softshells). Turtles with TFV1 may appear to have difficulty breathing, be reluctant to flee, and swim irregularly. Some infected Florida softshells demonstrate abnormal breathing, via extending and flexing their necks erratically, with occasional gurgling sounds when they exhale.

Left: Map of Florida, USA with the counties where TFV1 has been detected highlighted. Created by: Florida Fish and Wildlife Conservation Commission.

Right: Sick softshell turtle showing lethargy and neck extension. Photo credit: Florida Fish and Wildlife Conservation Commission.



RISK TO HUMANS & DOMESTIC ANIMALS

At this time, there is no evidence indicating that humans or wildlife other than turtles can be infected with TFV1. It is possible that TFV1 infects turtle species other than those listed above, so there are ongoing efforts to monitor all reports of sick and dead turtles to determine which species are susceptible to TFV1. Before handling a sick or dead turtle, contact the FWC.

PREVENTION & MANAGEMENT

There are not currently any known treatments for this disease. In 2021, the FWC enacted an Executive Order prohibiting the take and transportation of certain turtle species to prevent further transmission in native turtle populations while more research is done to fully understand this disease. While the Executive Order is for specific turtle species, it is recommended not to move or relocate any turtle species to minimize potential spread. Any sick or dead turtles with consistent field signs in Florida should be reported to the FWC (contact information at the link below).

REFERENCES

Florida Fish and Wildlife Commission: https://myfwc.com/wildlifehabitats/wildlife/freshwater-turtles/tfv1/

Waltzek TB, Stacy BA, Ossiboff RJ, Stacy NI, Fraser WA, Yan A, et al. 2022. A novel group of negative-sense RNA viruses associated with epizootics in managed and free-ranging freshwater turtles in Florida, USA. PLoS Pathog 18(3): e1010258. https://doi.org/10.1371/journal.ppat.1010258

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