

North Carolina - Aquatic Invasive Species report to GSARP, October 2016

Tiger Shrimp:

In 2016, there have only been 3 tiger shrimp reported, none have been confirmed. The first report was September 16, 2016. Tiger shrimp reports generally occur during the fall white shrimp season. There is no current research underway on tiger shrimp in NC.

Chinese Mystery Snail:

A new sighting of Mystery Snails has been reported from the Cape Fear basin (Oak Hollow Lake in High Point) in September 2016 and North Carolina Wildlife Resources Commission (NCWRC) staff are in the process of confirming identification. The Chinese mystery snail is now known from the following waters: Catawba basin (Lake Hickory, Lookout Shoals Lake, and Lake Norman), Yadkin/Pee Dee basin (High Rock Reservoir, Tuckertown Reservoir, Pee Dee River below Lake Tillery, and Pee Dee River below Blewett Falls Reservoir), Cape Fear basin (Jordan Lake, Oak Hollow Lake), Neuse River basin (Neuse River below Falls Lake), and the Roanoke basin (Lake Gaston).

Flathead Catfish:

Flathead Catfish appear to be moving upstream in several watersheds in the Tar River and Neuse River basins and are the likely cause for the decline of Carolina Madtoms. Intensive surveys and management actions, including Flathead Catfish removal, may be needed in the very near future to prevent Carolina Madtoms from going extinct.

***Salmincola* spp.:**

Since September 2014, NCWRC biologists have documented new biological threats to salmonids within the State. Gill lice (Copepoda: Lernaeopodidae: *Salmincola*) have been found on Brook Trout and Rainbow Trout populations. Elsewhere within the United States, *S. edwardsii* and *S. californiensis* are known to parasitize salmonids of the genera of *Salvelinus* and *Oncorhynchus*, respectively. Taxonomic and molecular analyses of copepods have now confirmed the identification of both species in North Carolina. In addition, anglers have been asked to report observations of gill lice during recreational outings, while the NCWRC will continue to sample Brook Trout and Rainbow Trout populations across the mountains of North Carolina to document the distribution and status of gill lice.

Whirling Disease:

On July 27, 2015, whirling disease was confirmed in Rainbow Trout collected from Watauga River – the first occurrence of the disease in North Carolina. Subsequent testing has identified the disease within Elk River. In addition, the NCWRC collected *Tubifex tubifex* (the worm host of the parasite) from its Delayed Harvest Trout Waters to test for the presence of *Myxobolus cerebralis* (the parasite that causes whirling disease); *T. tubifex* from Mill Creek and Watauga River were found to be positive. In addition, infected *T. tubifex* were collected above the NCWRC's Marion State Fish Hatchery. Currently, this facility is under renovation and biosecurity measures have been incorporated into the facility design. Trout have also been tested from NCWRC's trout production facilities – all were found to be negative. The NCWRC initiated testing of self-sustaining wild trout populations in spring 2016 for the presence of *Myxobolus cerebralis* and whirling disease. This effort focused on collecting representative samples across

a wide spatial extent, which examined approximately 1,500 trout from 36 localities. Four collections from three major river basins (Yadkin River, French Broad River, and Watauga River) were infected with *Myxobolus cerebralis*: Rainbow Trout from Roaring Creek; Brown Trout from South Toe River, Laurel Creek, and Boone Fork; and Brook Trout from Laurel Creek.

Didymo:

Researchers from Tennessee Tech University collected cells of the microscopic algae *Didymosphenia geminata* (Didymo) in Tuckasegee River while conducting regional surveys in late 2015 – the first time the organism has been documented in North Carolina. Additional research is needed to determine its prevalence in Tuckasegee River and throughout the State.

Lionfish:

The NOAA Fisheries Lab in Beaufort, NC compiles lionfish reports in the state. Lionfish continue to thrive off the NC coast. NOAA is working to address lionfish ecological impacts, control strategies, and various commercial harvesting methods. A current PhD student is working with NOAA making progress on lionfish aggregating devices, control plan development approaches, and research on lionfish sound production.

Aquatic Weed Control Program:

Lake Waccamaw:

Year 4 herbicide treatments with fluridone were conducted in 2016 at similar costs as 2015 (\$465K). Hydrilla has been completely suppressed by the treatments. No Hydrilla plants have been detected outside of the treatment area and there is no evidence that new tuber production has occurred since treatment began. Tuber densities have declined within the 960-acre treatment area since 2012, but remain at detectable levels. Continued management is needed to fully deplete the tuber bank in the infested area.

Eno River:

A large section of the river (~16 miles) was treated with fluridone in 2015 and 2016 to control hydrilla. This was the second year of a two-year pilot project with the objective to demonstrate the effectiveness of an herbicide treatment (fluridone) to control hydrilla in a riverine system. In 2015, a liquid formulation of fluridone was metered into the water at a single location. The treatment began in June and ended in August. The treatment effectively controlled the growth of hydrilla throughout the 16 mile stretch; however, treatment was ended early because of concern there may be impacts to non-target aquatic plant species. Two injectors were used in 2016 to control target concentrations with more precision and reduce the quantity of herbicide needed to control Hydrilla. Preliminary survey results suggest there was significant control of hydrilla with minimal to no impact to non-target plant and animal species.

The pilot project was overseen by the Eno River Hydrilla Management Task Force (ERHMTF), a partnership of local state and federal government agencies, academia and non-profit organizations. Eight of its members agreed to fund the two-year demonstration. Due to a programmatic limitation, DWR did not allocate cost-share any funds for 2016 and the 2016 was primarily funded by the remaining 7 partners. DWR Aquatic Weed Control Program limitation issue is described in another section of this report.

The ERHMTF is currently working on a 5-year management plan and 2-year implementation plan. A central location for information regarding this project has been developed on the NC Invasive Plant Council website, see <http://nc-ipc.weebly.com/eno-river-hydrilla-project.html>

Cape Fear Basin:

Additional localities of hydrilla have been confirmed. An established infestation in the Deep River at NC Highway 42 (Chatham County) was documented in August 2015. This is an important part of the range of federally endangered Cape Fear Shiner.

A small area at a public boat access in Lake Rim (Cumberland County) in Fayetteville was discovered by WRC and DWR in August 2016. Lake Rim was treated with herbicide in early September 2016, with another treatment scheduled for this fall. A more comprehensive long-term survey and management plan will be set up this winter.

NCWRC staff are working towards a plan to identify the extent of hydrilla occurrence in the upper half of the Cape Fear basin, with potential survey expansion into other vital rare aquatic species' habitats in the Chowan and Neuse basins.

Lake Gaston Hydrilla Project:

Approximately 3,500 acres of the ~20,000 acre lake have been infested with Hydrilla since circa 2000. Management has historically consisted of stocking triploid grass carp and large-scale fluridone treatments (averaging 1,000 acres per year). Herbicide treatments have been scaled back since 2013 responding to annual fall surveys which have showed significantly reduced hydrilla beds. Herbicide treatments in 2016 are expected to target 433 acres.

Albemarle Sound and Chowan River Project:

Hydrilla was confirmed at 4 sites along the Chowan River near Rockyhock in 2009. Additional hydrilla sites along the Chowan River plus sites within the Albemarle Sound (Eastmost River, Batchelor Bay, Salmon Creek, and tributaries of Edenton Bay) were identified in 2010. A delimiting survey was needed to cover the extensive area. In 2014 the NC Sea Grant organized a citizen-science volunteer survey to begin tackling this daunting task. The volunteers used tablets that were pre-loaded with an app that guided them through the data collection process. In 2015 the survey expanded in scope with the addition of Albemarle-Pamlico National Estuary Partnership (APNEP) and other government agency staff.

APNEP is forming a Hydrilla Technical Advisory Group. This group will draft an action plan on how to monitor and manage Hydrilla. Signs have been posted at boat ramps to educate boaters and other users on stopping the spread of aquatic invasive species.

The hydrilla infested creeks in Edenton Bay and the sites along the Chowan River have been treated with herbicides annually under the direction and financial assistance of the DWR. However, due to the lake limitation on the program these sites will go unmanaged in 2016 unless local governments take initiative. Early reports indicate that no hydrilla has been found during surveys in the Chowan River this season.

2015-2016 Funding:

The funding mechanism for the program is the Shallow Draft Navigation Channel Dredging and Lake Maintenance Fund. Up to \$500K can be used from the SDNCD&LM Fund for aquatic weed control. Money comes from 1/6 of 1% of the motor fuel tax plus a portion of the money collected from boat titles and registrations. Projects funded by revenue from the SDNCD&LM Fund must be cost-shared with non-State dollars on a one-to-one basis. The cooperator must be a local government, public utility or other agency. Private landowners are not eligible for financial assistance.

The programmatic limitation to lake-only project has been lifted. The NC general assembly incorporated amendments to the language which restored the ability of the program to support

projects in all waters of the state. The program retained two temporary environmental technicians to conduct field operations during the 2016 weed season.

Blue Catfish:

Recently blue catfish have become a topic of concern again in some parts of North Carolina. In December 2015, the state record 105lb blue catfish was caught and released in Lake Gaston. The same fishermen also caught two other catfish over 90lbs in the last 6 months in the lake. There have also been reports in the Chowan River of catfish in pound nets over 70lbs. The blue catfish range has been expanding over the years and the commercial landings have been increasing. Much of the concern is centered on HR 2419 (The Farm Bill) and a provision intended to impact imported aquaculture raised fish. Commercial fishermen are concerned since this is an increasing portion of their catch that cost of inspection will hinder processors from continuing to handle blue catfish and thus the management of this invasive species in NC waters.

State ANS Plan:

The NC Aquatic Nuisance Species Management Plan has been finalized by the working group and has been signed by all three departments. Currently there is no plan for submission to the national ANS Task Force for approval. The ANS committee is developing a budget request to submit in the Department of Environmental Quality budget to begin plan implementation.

End of report - compiled by Corrin Flora 09/23/2016