

The Wiagajk, “Margaree”, watershed is renowned for its historic Plamu, “Atlantic salmon”, fishery. The watershed is a cherished destination where anglers from around the globe come to cast their flies in its meandering waters. This remarkable ecosystem is one of the few watersheds where local Unam’aki members continue their traditional fishing practices, supported by the still-thriving salmon populations. Spanning over 120 kilometers of mainstem, including the largest natural lake in Nova Scotia, Lake Ainslie, the Wiagajk is a vast and vital watershed. However, despite its rich heritage and ecological significance, the Wiagajk is facing mounting challenges that have sparked concerns among local rightsholders and stakeholders about its future.

Warming water temperatures and the spread of invasive species, particularly smallmouth bass, are threatening the health of Atlantic salmon in the Margaree. Salmon are highly sensitive to temperature changes; when water temperatures rise above their optimal range, they suffer from reduced health and decreased activity levels, leaving them more vulnerable to predators, like smallmouth bass. The rapid spread of smallmouth bass is particularly alarming. These invasive predators have been steadily expanding their range from Lake Ainslie down the river's mainstem, posing an increasing threat to the native salmon population.

This summer, the [Margaree Aquatic Research team](#) have been working tirelessly to understand how young salmon adjust their behaviors and habitat use within cold-water refugia when invasive species are present. Cold-water refugia are crucial for salmon, providing safe havens where they can gather when surrounding water temperatures become too warm. However, these refuges may also come with a trade-off: high numbers of salmon in a small area may attract more predators, particularly opportunistic predators like smallmouth bass. As such, we are also exploring where and when smallmouth bass move within the river system, and whether Atlantic salmon have developed strategies to cope with this increasing spatial overlap, especially as they contend with rising temperatures. To address this possible overlap between fish species, we’ve been using acoustic telemetry to track the movements of juvenile Atlantic parr and smallmouth bass. This involves capturing and tagging individual fish, releasing them back into the water, and then monitoring their movements, habitat use, and behaviors over time.

With the recent mandatory retention of smallmouth bass, some may question, “why we would return tagged fish back to the river?”. The data we collect from tracking a small subset of smallmouth bass is invaluable and can provide data that is crucial to effectively managing their expanding population. This information can outweigh the potential impact to salmon from releasing a small number of tagged fish. Our work can allow us to pinpoint specific times, behaviors, and locations that should be targeted for management interventions, leading to more strategic and effective conservation plans. For example, instead of merely removing smallmouth bass as bycatch, local organizations could focus their efforts on targeting invasive species in areas where it would have the greatest impact, such as around cold-water refugia when predation

is most likely or near spawning habitats when nesting occurs. Identifying these critical areas and when to target them can work in step with current measures in crafting effective management strategies. While we have permission to return these fish to the water, anglers do not. Therefore, we ask anyone who catches our tagged fish (identifiable by a green plastic tag in the dorsal fin – see figure 1 below) to contact us. You can reach us via Instagram/Facebook DMs at [Margaree Aquatic Team](#) or by emailing Kristen Cyr, the project lead, at cyrk@uwindsor.ca (See figure 1 below).

ATTENTION ANGLERS
SMALLMOUTH BASS RESEARCH PROJECT

To better understand smallmouth bass movement in the Southwest Margaree, a tagging study is being conducted by the University of Windsor.

Marked fish will have an identification marker inserted near the dorsal fin.



If you catch a marked smallmouth bass, please contact Kristen Cyr (cyrk@uwindsor.ca)
Thank you for your help with our project!

 University of Windsor If you have any questions regarding the project, check out our Instagram or Facebook page!
[@margareeaquaticteam](#)

Figure 1. Posted signage throughout the SW Margaree, requesting that anglers let us know where they catch marked fish so we can resample our tagged individuals.

Managing invasive species is not a quick fix, and each watershed requires unique approaches tailored to its specific environmental characteristics, such as watershed size, or community composition of species. In a large watershed like the Margaree, multiple adaptive management strategies are necessary, which is why our research is being conducted in collaboration with management authorities. Our goal is not to interfere with current management plans but to help grow and adapt these plans by better identifying more specific challenges facing the Margaree watershed thereby developing solutions that will protect these aquatic ecosystems for generations to come.



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Figure 2 A) PhD student Kristen Cyr (front), masters student Izzy Tormasi (middle), and masters student Holly Mosco (back) crossing the river to pound in rebar as an anchor for lights. B) Holly Mosco (left), Kristen Cyr (middle), and Izzy Tormasi (right) prepared to tag Atlantic salmon parr, and adult smallmouth bass with acoustic transmitters. C) Izzy Tormasi (front), Holly Mosco (left), and Kristen Cyr (right) preparing to record habitat characteristics of a receiver deployment site.