

Volunteer AIS Monitoring of the Wood and Pawcatuck Rivers

A Collaborative Project between the Rhode Island Department of Environmental Management – Office of Water Resources and the Wood-Pawcatuck Watershed Association

Introduction

During summer 2010, the Rhode Island Department of Environmental Management – Office of Water Resources (RIDEM) and the Wood-Pawcatuck Watershed Association (WPWA) initiated a collaborative project to map aquatic invasive species (AIS) in the Wood and Pawcatuck rivers.

RIDEM had previously surveyed various lakes and river segments for the presence of invasive species and found AIS widely distributed across the watershed. Species observed in lakes in the watershed include variable milfoil (*Myriophyllum heterophyllum*), fanwort (*Cabomba caroliniana*), Eurasian milfoil (*Myriophyllum spicatum*), water chestnut (*Trapa natans*) spiny naiad (*Najas minor*), Brazilian elodea (*Egeria densa*), mudmat (*Glossostigma cleistanthum*), water hyacinth (*Eichhornia crassipes*), American lotus (*Nelumbo lutea*) and Asian clam (*Corbicula fluminea*). Despite the large number of species documented in lakes within the watershed, many with outlets flowing directly into the Wood or Pawcatuck rivers, only variable milfoil has been observed in either river by RIDEM.

However, knowledge of the aquatic plant communities of these rivers is limited, as AIS work has focused largely on lakes. There are also several gaps in information on the distribution of known variable milfoil populations in the rivers. Stands of variable milfoil were documented in various parts of the Wood River, but it was not confirmed that these stands represent a single continuous population. The extent of the infestations in both rivers was unknown. The project between RIDEM and WPWA aimed to mobilize volunteers to collect field data to help fill in these gaps

Methods

RIDEM worked with WPWA to provide training in invasive species identification to WPWA volunteers. The training included a brief introduction to the issues surrounding invasive species, and a presentation on identifying common invasives and distinguishing them from their native look-a-like species. The training focused mostly on plants, although Asian clam and the zebra mussel were included.

Each volunteer was then assigned a section of river, predetermined by WPWA, to paddle and survey for AIS. Volunteers were provided with survey forms to fill out during their paddle to document invasive sightings and instructed to collect samples of suspicious plants. Plant samples were collected by RIDEM personnel and identified.

Results

The identification training was conducted on August 26, 2010 and survey forms were returned through the end of September. Overall 10 volunteers returned forms representing 8 stretches of river (4 in the Pawcatuck River and 4 in the Wood River) (see attached map). Samples of suspicious plants were taken from 4 of these segments.

AIS were documented at 5 of the surveyed segments (2 in the Pawcatuck River and 3 in the Wood River). A sample was taken at 3 of the 5 segments, allowing RIDEM personnel to confirm the identity. All three samples were taken from Wood River segments. Thus, a confirmation of the identity of invasives recorded in the Pawcatuck was not achieved. The documented species were as follows:

Pawcatuck River

Variable milfoil (*Myriophyllum heterophyllum*)

Eurasian milfoil (*Myriophyllum spicatum*)

Mudmat (*Glossostigma cleistanthum*)

Wood River

Variable milfoil (*Myriophyllum heterophyllum*)

Discussion

Positive identification of samples collected by WPWA confirmed the presence of a continuous population of variable milfoil in the Wood River stretching from Wyoming Pond downstream to Alton Pond. Previous RIDEM surveys immediately upstream from Wyoming Pond and a WPWA volunteer survey in Frying Pan Pond found no AIS upstream. This indicates that Wyoming Pond is likely the pioneer infestation of variable milfoil and a likely source of the downstream population. Variable milfoil was independently introduced to Locustville Pond, which may also contribute to the downstream population. Whether variable milfoil was independently introduced to Alton Pond (which maintains a public boat ramp), or introduced from upstream sources in the Wood River, is unknown.

Results suggest that the Lower Wood River has suffered, or is at risk of, severe losses of biodiversity. Variable milfoil is an aggressive invader that can displace native aquatic plants, resulting in dense, monotypic stands of the invasive. This directly reduces the diversity of aquatic plants in the river, and can indirectly affect animal populations (by displacing beneficial native plants that native wildlife rely on or by altering available habitat). The great diversity of native plants observed by RIDEM-OWR in a survey of the Wood River from Barberville Dam upstream to Frying Pan Pond (see RIDEM-OWR 2010 Field Reports) displays the aquatic biodiversity of the region that could be lost by the expansion of invasive milfoil populations.

The results obtained by WPWA surveys are useful to inform management decisions. The presence of a continuous population in the Lower Wood River indicates the expansion of the population by the downstream transport of plant fragments. Thus, management in the lower watershed would likely be ineffective as long as upstream populations persist. Any management efforts undertaken in the Wood River would likely be most effective if they began by targeting the upstream source populations (currently Locustville Pond and Wyoming Pond). Although there is a large variable milfoil population in Breakheart Pond and another reported on herbicide permits in Boone Lake, there is no evidence of viable plant fragments being transported out of these water bodies and establishing downstream.

Results obtained for the Pawcatuck contain a measure of uncertainty. Three species were documented by volunteers, but no samples were taken. Although volunteers participated in the training on AIS identification, the misidentification of a native *Potamogeton* (pondweed) species for the invasive *Potamogeton crispus* (curlyleaf pondweed) by one volunteer highlights the potential for misidentification. Because none of the invasives documented in the Pawcatuck could be confirmed by RIDEM-OWR personnel, they are considered *suspected* infestations.

Variable milfoil and Eurasian milfoil were recorded in a segment of the Pawcatuck River by the outlet of Meadowbrook Pond. Although no variable milfoil was observed by a RIDEM spot-check of the river at the crossing of Kings Factory Road, Meadowbrook Pond maintains an established population of variable milfoil. Thus, it is possible that Meadowbrook pond could serve as a source of infestations in the Pawcatuck if plant fragments are transported over the dam. Variable milfoil recorded upstream of the outlet from Meadowbrook is of unknown origin.

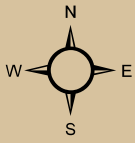
Eurasian milfoil in this segment is suspicious as the only known population in the watershed is in Chapman Pond in Westerly, RI. No other known populations of the species exist in close proximity to the watershed. Mudmat was observed by WPWA volunteers a short distance upstream from the outlet of Meadowbrook Pond and just downstream from the confluence of the Wood and Pawcatuck Rivers. Mudmat was observed in Yawgoo pond during a 2010 RIDEM survey and is documented in Meadowbrook Pond in the scientific literature (Les, Donald H., Robert S. Capers and Nicholas P. Tippery. 2006. *Introduction of Glossostigma (Phrymaceae) to North America: a taxonomic and ecological overview*. American Journal of Botany 93: 927-39). Thus, there are potential source infestations of mudmat in the

Pawcatuck River. All records of AIS in the Pawcatuck by WPWA volunteers will be used to direct RIDEM-OWR staff during summer 2011 to confirm the identity of these sightings.

Overall, the volunteer monitoring initiative with WPWA yielded important information. Documentation of variable milfoil in the Wood River helped confirm the existence of a continuous population, likely beginning in Wyoming Pond and transported downstream by currents. Although reports from the Pawcatuck couldn't be confirmed, they will help direct monitoring efforts for the 2011 field season.

Future volunteer monitoring efforts could compensate for the shortfalls of this project by providing a more intensive training (to avoid misidentification) and by requiring volunteers to collect samples of all suspicious plants they document. Further, there was a section of the Pawcatuck River where RIDEM-OWR has consistently documented variable milfoil during biomonitoring fieldwork (including during August 2010) where WPWA volunteers did not observe the invasive. This indicates that it is possible for surveyors to miss invasive populations. This may be especially likely in the Pawcatuck, where the water is dark and tannic and deep in parts. Thus, given enough people, it may be beneficial to assign multiple volunteers to each river segment, increasing the likelihood of an invasive being observed.

Aquatic Invasive Species (AIS)* Documented in the Wood- Pawcatuck Watershed by RIDEM-OWR and WPWA Volunteers

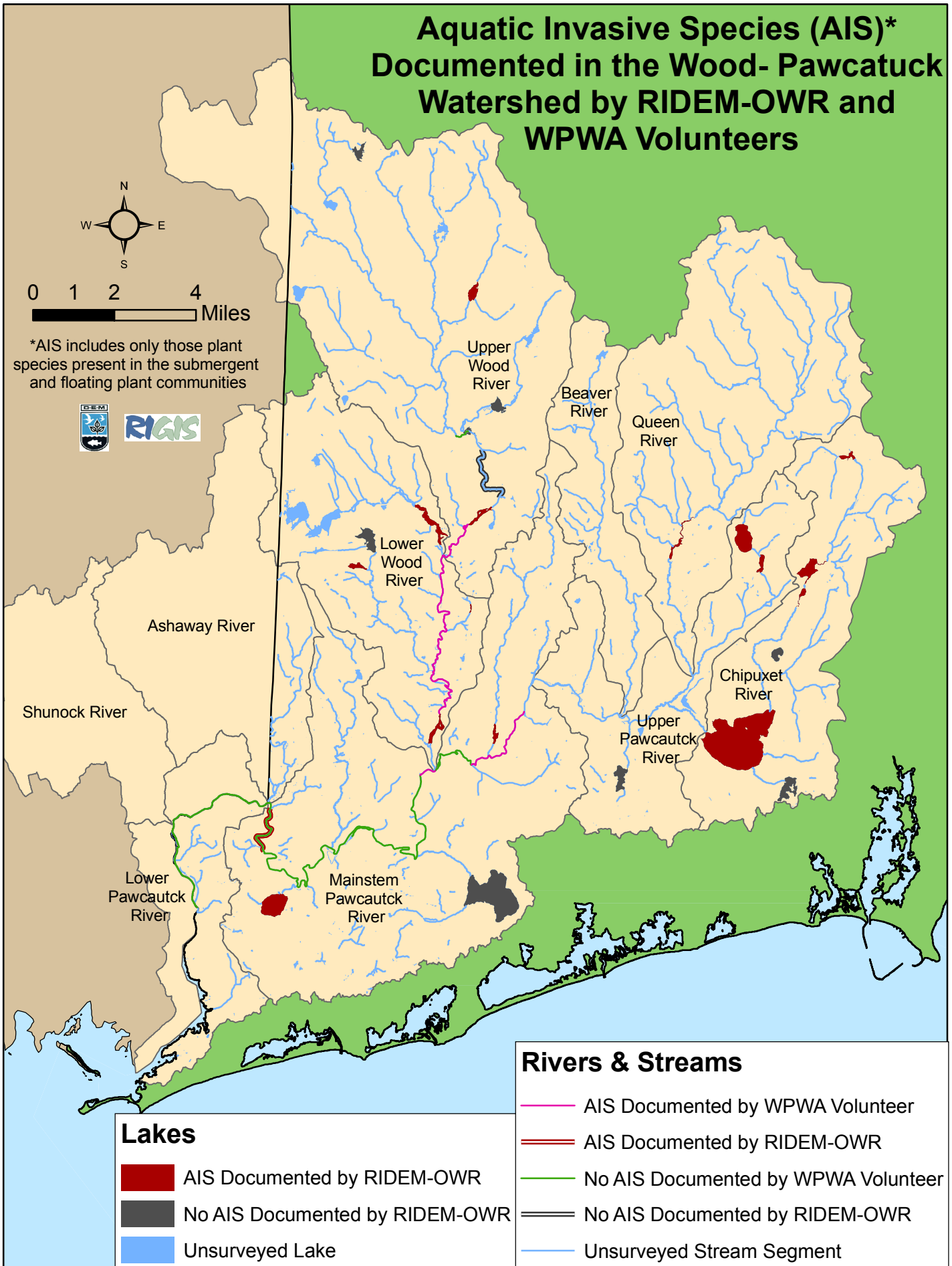


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*AIS includes only those plant species present in the submergent and floating plant communities



RIGIS



Lakes

- AIS Documented by RIDEM-OWR
- No AIS Documented by RIDEM-OWR
- Unsurveyed Lake

Rivers & Streams

- AIS Documented by WPWA Volunteer
- AIS Documented by RIDEM-OWR
- No AIS Documented by WPWA Volunteer
- No AIS Documented by RIDEM-OWR
- Unsurveyed Stream Segment