2021 UW-Oshkosh Boat Decontamination Program Data Analysis

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2021 UW-Oshkosh Boat Decontamination Program Summary

UW-Oshkosh Decontamination Program Data: 2018-2021 Comparison Table
Data sourced from UW-Oshkosh Decontamination Program Annual Reports

	2018	2019	2020	2021
Number of Boats Decontaminated	71	82	139	376
Number of lakes potentially **protected** from spiny waterfleas or zebra mussels exposure due to boater **self-initiated** additional AIS prevention steps**	0*	0	1	0***
Number of lakes potentially **protected** from spiny waterfleas or zebra mussels exposure due to **UWO decontamination**	2*	7	16	10
Number of lakes potentially **exposed** to spiny waterfleas or zebra mussels due to not decontaminating/taking additional steps	2*	7	18	4***

*figures sourced from data with a very low number of survey respondents
**high or low pressure washing, chemical treatments, or wiping down
***includes data from only boaters accepting decontamination services upon entering or leaving the landing; boater travel data from boaters not accepting decontamination services are not included

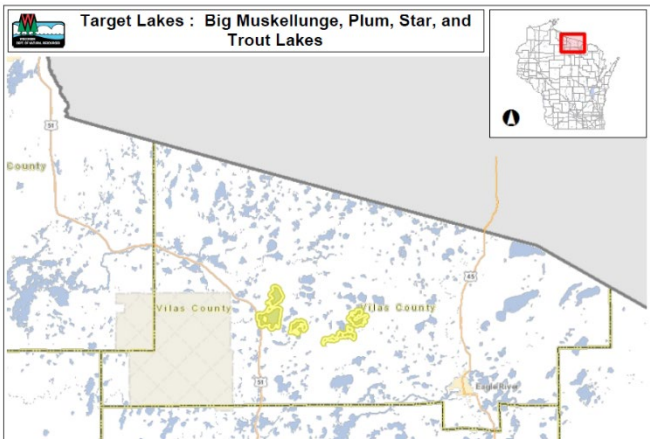
Recommendations from 2021

- Carefully show decontamination interns the procedure for data collection so that all boaters' data is recorded. This will make year-to-year comparisons possible.
- Track parts of the boat recommended for decontamination vs. actually decontaminated. For example, the hull, motor, bilge, livewells on fishing boats, and ballast tanks on wakeboats.
- Track boater transiency in future years – are trends to be transient really decreasing?
- Choose to decontaminate transient boats over non-transient boats during busy times.
- Offer towels to boaters to wipe down lines when no decontamination unit is available.

Program Background

The UW-Oshkosh Boat Decontamination Program in Vilas County has been in place since 2018. UW-Oshkosh interns were stationed at four different boat launches between May-August 2021 to offer voluntary decontamination via hot pressure washing of boat & equipment to any willing boaters in an effort to further prevent the spread of small-bodied aquatic invasive species (AIS). In particular, the target species of this program are invasive spiny waterfleas, and to a slightly lesser degree zebra mussels. Most of Vilas County's lakes do not provide suitable habitat for zebra mussels, but do provide ample suitable habitat for spiny waterfleas (Spear et. al.).

The single hot pressure washer is a 200 gallon mobile unit on a trailer. Decontamination sites were predetermined from previous program years based on: proximity to other spiny waterflea infestations, location safety, ability for wash water to infiltrate vs. run off into surface waters, boater traffic rates, space available at the launch area, and willingness of launch owners to partner with the program. Target lakes in 2021 were Big Muskellunge Lake (3-12 miles away from the following three spiny waterflea verified lake landings); Plum Lake (verified spiny waterflea in 2019); Star Lake (verified spiny waterflea in 2013); Trout Lake (verified spiny waterflea in 2014).



Boats were decontaminated at 4 boat landings on the Northern Highlands State Forest – 3 of the lakes have verified spiny waterfleas, and 1 does not.

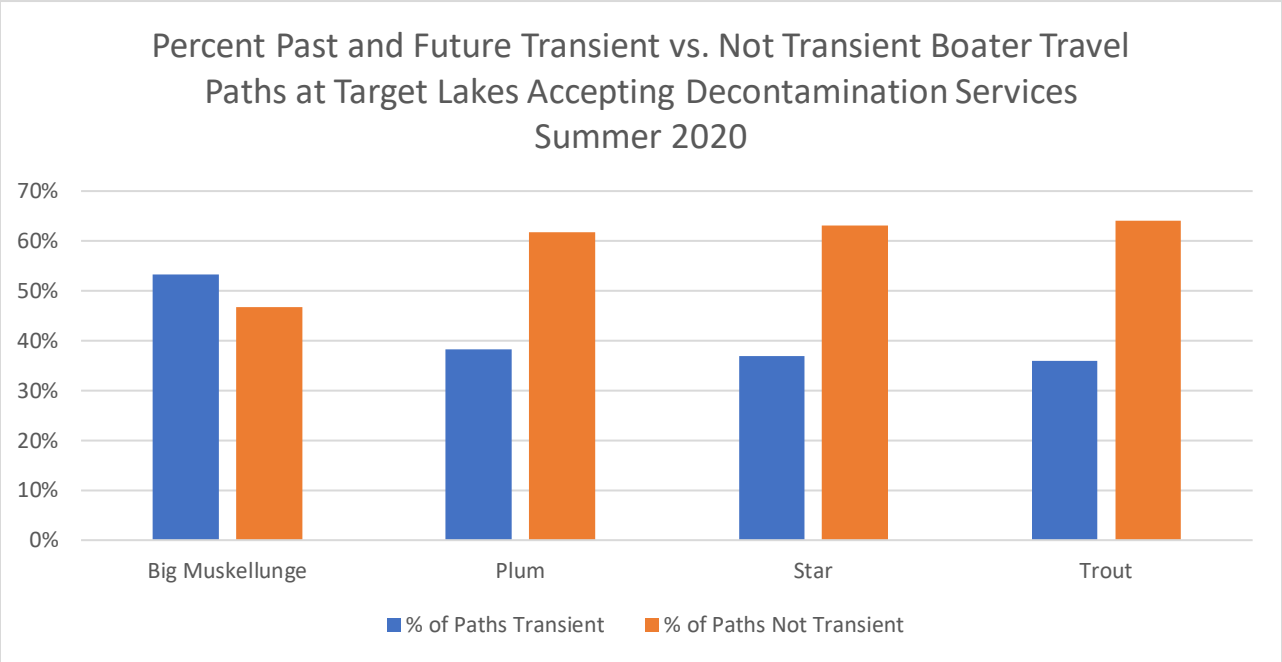
Previous and planned future boater transiency within 5 days of the encounter with a boater was reported to be at 29% in 2020, and 41% in 2019. For purposes of this report, "transient boater" refers to using the same watercraft on more than one waterbody within five days. In 2021, data were collected only from those boaters who decided to decontaminate their boat or equipment, representing a different set of respondents than previous years. While it does not make sense to compare the 2021 transiency rate to the 2020 or 2019 rates, the rate of boater transiency among those decontaminating their boat or equipment in 2021 was 16% - a surprisingly low figure. Fishing boats comprised 78% of all boat accepting decontamination services in 2021.

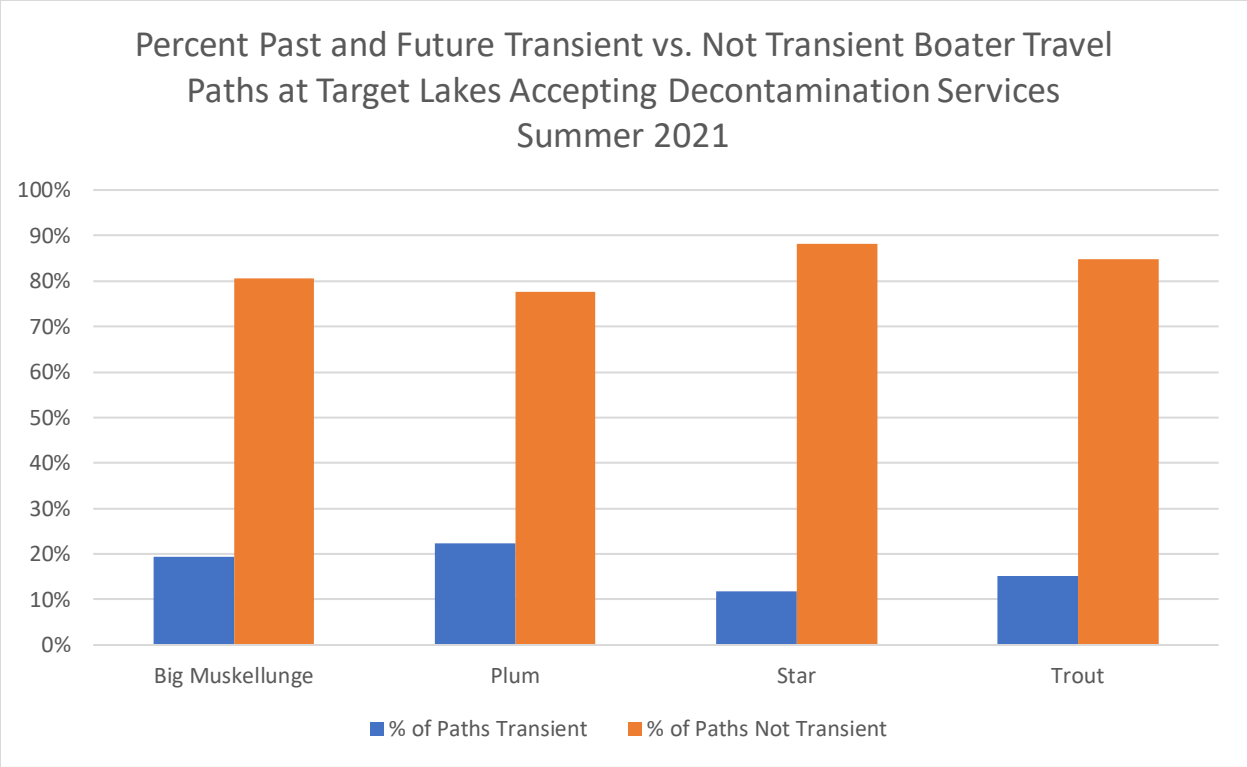
Some boaters take steps on their own beyond state requirements to prevent AIS spread. High pressure washing, low pressure washing, chemical treatments, or wiping down their boat on their own were reported in 32 of the 620 (5%) boater travel paths discussed with boaters in 2021.

By asking boaters about lakes they took their boat to in the last five days, and where they plan to take their boat in the next 5 days, a lake list was made of potential exposure to spiny waterflea and zebra mussels. In 2021, four lakes were potentially exposed to these AIS due to not decontaminating or taking extra steps, and five lakes were potentially protected from exposure to these AIS due to accepting decontamination services. No lakes were documented to be potentially protected from exposure as a result of boater self-initiated extra steps.

Boater Transiency

Boater transiency was measured on the "back-end" by asking only boaters who decontaminated their boats or equipment if they had used the boat in a different waterbody in the last five days. It was also measured on the "front-end" by asking where they plan to use their boat in the next five days. Because boater transiency data was not collected from all boaters encountered in 2021, data cannot be compared with 2018-2020 figures used in the annual program analysis reports. However, data from just those who decontaminated boats can be considered from 2020 and 2021. Summer 2021 saw many more non-transient boaters accepting decontamination services.

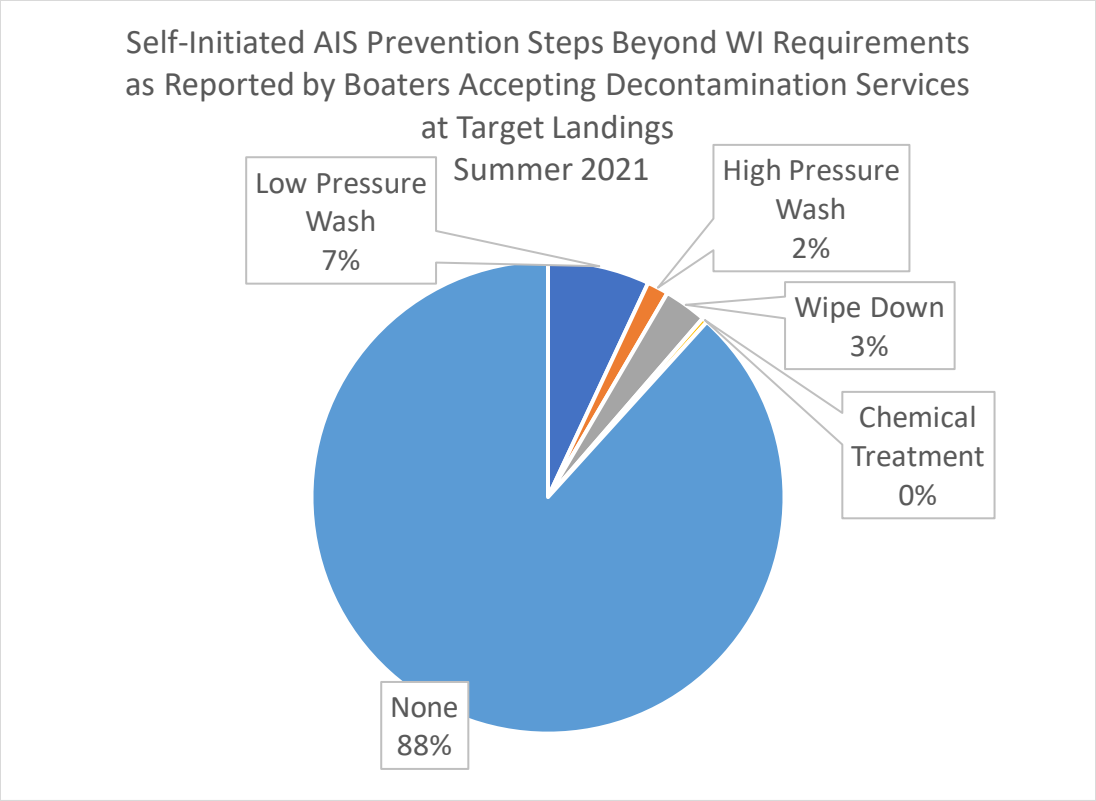




Boater transiency among those accepting decontamination services dropped from 40% in 2020 to 16% in 2021.

Additional Self-Initiated Steps Boaters Took

In 2021, 32 boaters who accepted decontamination services also reported taking extra steps beyond the "inspect, remove, and never move" required steps. Among those reported are low pressure washing (such as a garden hose), high pressure washing (car wash/pressure washer), wiping down, and chemical treatments. However, 88% of boaters accepting decontamination services reporting doing nothing extra beyond the state requirements of "inspect, remove, drain, and never move life fish".



Decontamination Program Efficacy

The decontamination program can be considered effective if it is preventing potential spiny waterflea and/or zebra mussel exposure in lakes. In 2021, only data from those accepting decontamination services upon entering the lake, leaving the lake, or both were recorded and analyzed. Boaters choosing to not decontaminate at all were not recorded, so the potential AIS exposure data is not well suited for comparisons between previous years. This analysis considers boater travel within 5 days previous and planned future 5 days. It also considered what AIS are already verified in waterbodies according to Wisconsin DNR publicly available data (*Aquatic Invasive Species Locations*). This analysis does not consider habitat suitability, however most lakes in Vilas County are considered suitable (Spear et. al.) for spiny waterfleas. If a boater reported taking any extra steps on their own (high pressure wash, low pressure wash, chemical treatment, or wiping down), it was assumed that decontamination did nothing extra to remove AIS and was not counted as having an impact.

Each boat encounter was assigned two "travel paths" – travel from the previous lake up to 5 days prior to arriving at the point of contact; and planned travel to the next lake up to 5 days after arriving at the point of contact. Data was categorized into travel paths based on whether the boater decontaminated, reported doing extra steps on their own, or did nothing extra. The travel path data was then categorized a second time to see if:

- Spiny waterfleas or zebra mussels were verified in the prior waterbody and not the next waterbody
- Both prior and next waterbodies had verified spiny waterfleas or zebra mussels
- Spiny waterfleas or zebra mussels were not verified in the prior waterbody

- There was no boater transiency within the 5 day period
- There was not enough data to accurately determine any of the above

From there, it was determined if the decontamination or extra steps boaters took had an impact on AIS prevention. If a lake was potentially exposed to spiny waterfleas or zebra mussels, but that same species was already verified in the next lake, it was assumed that further exposure to that species would not have impact.

Impacts of Decontamination at Target Lakes
Summer 2021

		Count	% of travel paths
Watercraft Decontaminated by UW-Oshkosh	**Prevented** spiny waterflea/zebra mussel potential exposure	10	1.61%
	Decontamination not needed to prevent potential spiny waterflea/zebra mussel exposure	335	54.03%
	Not enough data	9	1.45%
Self-initiated extra steps to prevent AIS spread: high pressure wash; low pressure wash; chemical treatment; or wiping down	**Prevented** spiny waterflea/zebra mussel potential exposure	0	0.00%
	Self-initiated extra steps not needed to prevent potential spiny waterflea/zebra mussel exposure	32	5.16%
	Not enough data	0	0.00%
No Decontamination or extra steps	Potential **exposure** to spiny waterflea/zebra mussel documented	4	0.65%
	Choosing to not decontaminate and/or take no extra steps was appropriate	223	35.97%
	Not enough data	7	1.13%
Total Travel Paths		**620**	

On 10 occasions, decontamination prevented spiny waterflea or zebra mussel spread – this accounts for 1.61% of the travel paths documented. In 338 occasions, boaters decontaminated but it would not have been necessary to do so to prevent AIS spread (54.03%). On 4 occasions, the boater did not decontaminate or report any extra steps to prevent AIS spread and potential exposure to spiny waterflea or zebra mussels was documented. For 590 of the 620 boat travel paths, decontamination was determined to be not needed (95%). This was because: the boater was not transient; the previous waterbody did not have verified spiny waterfleas or zebra mussels; or both the previous waterbody and next waterbody had either spiny waterfleas or zebra mussels verified. Conversely, 5% of boat travel

paths would benefit from decontamination by further preventing potential exposure of spiny waterfleas or zebra mussels.

Lakes Where Potential Exposure to Spiny Waterflea/Zebra Mussel Was Prevented

The decontamination program protected 5 lakes, Big Muskellunge Lake on multiple occasions, from potential exposure to spiny waterfleas.

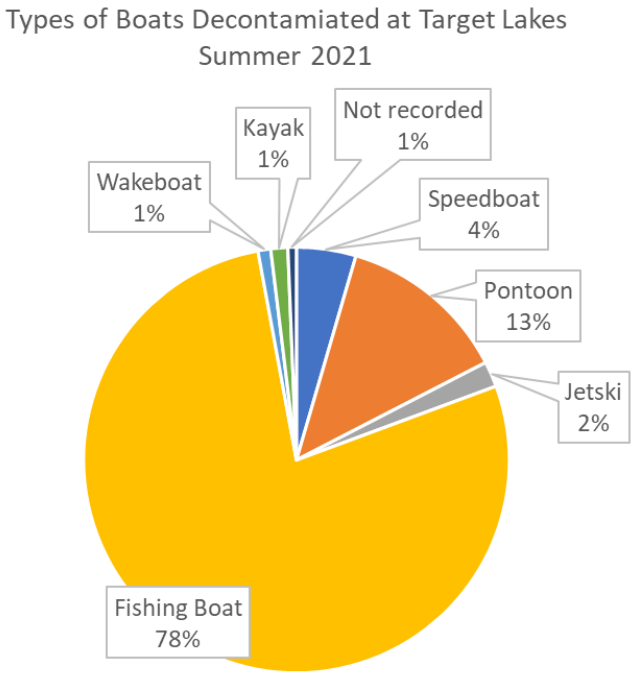
List of Lakes Where ZM/SWF Potential Exposure Was Prevented Summer 2021				
Lake Name Where Potential Exposure Was Prevented	**County**	**WBIC**	**ZM or SWF**	**Previously Visited ZM/SWF Verified Lake**
Big Muskellunge Lake	Vilas	1835300	SWF	Plum Lake
Big Muskellunge Lake	Vilas	1835300	SWF	Plum Lake
Big Muskellunge Lake	Vilas	1835300	SWF	Plum Lake
Big Muskellunge Lake	Vilas	1835300	SWF	Plum Lake
Big Muskellunge Lake	Vilas	1835300	SWF	Star Lake
Big Muskellunge Lake	Vilas	1835300	SWF	Plum Lake
Island Lake	Vilas	2334400	SWF	Star Lake
Lost Lake	Vilas	1593400	SWF	Star Lake
Sawyer County Lakes	Sawyer		SWF	Star Lake
Three Lakes Chain	Oneida		SWF	Plum Lake

Lakes Where Potential Exposure to Spiny Waterfleas or Zebra Mussels Was Not Prevented

Due to boaters not decontaminating or taking extra steps, 4 lakes were documented to be potentially exposed to spiny waterfleas. However, this is incomplete data as only those boaters who accepted decontamination services repsonses were recorded. Undoubtedly, there would be other boaters who did not accept decontamination services that traveled between spiny waterflea/zebra mussel verified lakes.

Lakes Where ZM/SWF Potential Exposure Was Documented Summer 2021				
Potentially Exposed Lake Name	**County**	**WBIC**	**ZM or SWF**	**Potential Exposure from ZM/SWF Verified Lake**
Big Muskellunge	Vilas	1835300	SWF	Trout Lake
Big St. Germain Lake	Vilas	1591100	SWF	Trout Lake
Fence Lake	Vilas	2323000	SWF	Star Lake
Little St. Germain Lake	Vilas	1596300	SWF	Plum Lake

Participating Watercraft



Of all the boats decontaminated, fishing boats were by far the most prevalent, followed by pontoons. These figures are similar to data collected on all boaters encountered in 2020, perhaps reflecting that acceptance of decontamination services may not be locally corelated with the type of watercraft used. This is an observation, and more analysis would be needed to determine if this is true.

Discussion and Future Planning

Impact of Decontamination: Five lakes were documented to be protected from potential exposure to spiny waterfleas due to the UW-Oshkosh Decontamination program; and 4 lakes were documented to be exposed to spiny waterfleas due to choosing to not decontaminate. This may seem like a small number of lakes for Vilas County, especially when considering that documented boater transiency decreased considerably in 2021. Since that spiny waterfleas are still detected in the Vilas County lakes and transient boaters tend to not take extra steps on their own to decontamination, the UW-Oshkosh Decontamination program holds value in protecting lakes from spiny waterfleas and zebra mussels where infestation is most likely to happen.

Targeting Transient Boaters: There was a large shift in the amount of transient vs. non-transient boaters accepting decontamination services between 2020-2021. In 2020, 97 of 242 (40%) boater travels paths of boats accepting decontamination services were considered transient. In 2021, this dropped to 102 of 620 (16%) boater travels paths accepting decontamination services being considered

transient. It isn't certain why this figured dropped so low, but less boater transiency is beneficial to preventing the spread of AIS.

The bulk (95%) of boaters who accepted decontamination services did not actually need decontamination services to improve rates of spiny waterflea or zebra mussel prevention – they may not be transient; the lake they were going to may already have the same invasive spiny waterflea or zebra mussels where decontamination would not impact potential exposure; or their prior and next lake both are not know to have invasive spiny waterfleas or zebra mussels. While the landings where decontamination services are used are not considered very busy (between 1.1-2.5 boats/hour) (*Watercraft Inspection Results*), occasionally there are instances where it would be handy to triage which boats would benefit from decontamination services. On busier days, skipping decontamination requests from non-transient boaters to decontaminate transient watercraft would keep the program effective.

The 2018 UW-Oshkosh Decontamination report mentioned that getting a 25-30% decontamination participation among boaters might be a realistic goal (Higley 2019). This is based on regional data indicating 56% boaters visit another waterbody within 5 days (Witzling 2014). Vilas County Land & Water interviewed transient boaters in 2017 and found that 72% of transient boater would be willing to decontaminate their boats (Higley 2017). This would suggest an ideal participation rate of 40% (72% of 56%), but once "real life" situations are factored in, a 25%-30% participation rate might be a more realistic goal. Unfortunately, the 2021 data was collected in a way where this figure could not be accurately calculated. However, the 2020 data indicate a 21% participation rate, falling a bit short of this goal.

Livewells and boat components: In 2021, there is a high percentage of fishing boats encountered (78%), implying a high use of livewells. 2020 data reported a similar figure of 79%. However, when asked of all boaters in 2020 only 10.5% indicated they had used their livewells today. It may be that the risk of livewells being a significant vector has been inflated. Anecdotal accounts from local DNR Conservation Officer Tim Price suggest that the 10.5% may be too low (Price 2020). It would be good to continue to collect data in future years on livewell use. If interns/staff could list which boat components they recommend to decontaminate vs. which boat components actually get decontaminated, it would offer a better window to how important of a vector livewells are, and what components boaters are willing to allow interns to decontaminate. This would aid in understanding how thorough boaters are willing to be when decontaminating.

Encourage Decontamination: Researchers admit there is a likely a significant lag time between spiny waterflea establishment and detection (Vander Zanden). This factor makes it important that the program not deny decontamination to a willing participant just because spiny waterfleas were not yet verified in their previous waterbody. However, when spiny waterfleas are not verified in a lake, such as Big Muskellunge Lake, it is possible they are truly not established and decontamination prior to entering should be highly encouraged for transient boaters. The data on potential AIS exposure relies on verified data, and decontamination may actually be doing more for AIS prevention than is being detected.

Data collection: The data collection protocol should be carefully imparted to the decontamination operators, and supervisors should take time to determine that the protocols are properly being followed in the early season. It is important to document data from all boaters encountered, not just the ones

who agreed to decontaminate their boat. This will allow for a much more accurate and thorough year-to-year data comparisons.

Lines in the Water: Recent research from Don Branstrador, a spiny waterflea researcher, has indicated that spiny waterfleas most often adhere to lines in the water – primarily fishing line and anchor line. Branstrador proposes these can be wiped off, and suggests offering compostable Swedish dish towels to boaters for this purpose (Branstrador). The decontamination program might want to consider handing out these towels to boaters frequenting spiny waterflea lakes so they can manually remove those attached to lines when a decontamination unit is not available.

Outreach Product: Printed Swedish Dishcloth

Example of Swedish dishcloth design from the Minnesota AIS Research Center.

Program Continuation: Due to a lapse in funding, the UW-Oshkosh boat decontamination program does not anticipate operating in 2022. However, partner organizations are working to ensure the program is back and functional in 2023.

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2021 Decontamination Unit Training

Thursday, May 20th
9:00 am – 12:00 pm

Kemp Natural Resources Station
9161 Kemp Rd
Woodruff, WI 54568

9:00	Welcome & Introductions
9:15	Power Point (Why, Unit, Safety/PPE, Surveys)
10:00	Break
10:15	Practice
11:15	Trailer Training

Intro:

Hello, I am from UW Oshkosh. We have partnered with the Wisconsin DNR and have developed a decontamination program for Vilas County. The decontamination program offers a staffed hot pressure washer unit to wash your boat. Would you be interested in having your boat decontaminated today, this will only take a few minutes.

If yes… give them directions to drive to the decontamination area. Once they are at the decontamination area ask them to fill out the survey and place it in the drop box or mail it to us with the prepaid envelope.

If no… ask them if they would be willing to answer a few questions, it should only take about 2 minutes. (Questions 2&3 are designed to be "fill in the blank", but offer suggestions if they ask or seem stumped)

1. Have you boated on this lake in the past 12 months?

   Yes / No

2. What are some reasons you choose to not have your boat decontaminated with the staffed hot pressure washer today?

   Suggestions:
   - Do not have time
   - Clean boat at home
   - Do not think it is effective against aquatic invasive species
   - This is the only lake I boat on
   - Not being able to operate the unit yourself
   - Don't want to use hot water on the boat/equipment
   - Think it will damage my boat
   - Not interested

3. What if anything might motivate you to decontaminate your boat with the hot pressure washer?

   Suggestions:
   - More information on the unit/program
   - Results showing the effectiveness
   - Being able to operate the unit myself

Closing: That's all I need for now unless you'd like to tell me about boat decontamination or aquatic invasive species in Vilas County.

1. Which category best describes the type of boat you brought to the decontamination site?

___ Fishing Boat ___ Motor/Speed Boat ___ Personal Watercraft
___ Pontoon Boat ___ Wake Boat ___ Canoe/Kayak/Paddle Board

2. Does the boat you brought have a live well?

___ Yes ___ No *(skip to question 4)*

3. Did you use your live well today?

___ Yes ___ No

4. Did you use your boat on more than one body of water in the last five days?

___ Yes ___ No *(skip to question 6)*

5. Wisconsin boaters are required to inspect their boat for plants and animals, drain water, and follow the Wisconsin bait law. Which of the following *additional* steps did you take to prevent the spread of aquatic invasive species? (Not required by Wisconsin law).

___ Low Pressure Wash (such as garden hose) ___ Chemical Treatment (such as bleach solution)

___ High Pressure Wash (such as car wash) ___ No additional steps were taken

___ Other (Please specify) _____

6. Do you plan on using the boat you brought to the decontamination station in the next 5 days? If so, where?

___ Yes, Where? _____ ___ No ___ Unsure

7. As a boater in Vilas County, how concerned are you about aquatic invasive species being introduced in Vilas County?

___ Very concerned ___ Not too concerned ___ Neither nor unconcerned

___ Somewhat concerned ___ Not at all concerned

8. Thinking about the boating you do in Vilas County; do you think this is a convenient location for the hot pressure washer unit?

___ Yes ___ No

If NO, do you have a suggestion on a more convenient location? _____

9. Would you like to see staffed hot pressure washes continue to operate at strategic boat landings in Vilas County as an aquatic invasive species prevention tool?

___ Definitely would ___ Probably would not ___ No Opinion

___ Probably would ___Definitely would not

10. What motivated you to have your boat decontaminated today? (Check all that apply)

__ Concerned about spreading aquatic invasive species
__ Enjoy having a clean boat
__ Only takes a few minutes
__ Other (please specify)_____

11. What if anything more would you like to tell us about the staffed hot pressure wash or about aquatic invasive species in Vilas County?

_____

_____