

MERV Demonstration

Lake Okeechobee

June, 11th 2020

South Florida Water Management District: Vegetation
Management Division

Floating Aquatic Vegetation (FAV)

- FAV is a serious problem within Florida's waterways
- Obstructs boat navigation
- Displaces submerged and emergent native aquatic vegetation creating a monoculture
- Blocks wave action, preventing water oxygenation
- Rapid growth rate forms floating mats and accumulates organic material in the benthic layer
- *Mansonia* genus mosquitos use FAV in their early life stages
- Can be destructive to canal structures/bridges
- Prevents or reduces water flow needed for flood control



Multipurpose Environmental Response Vessel

Variable Beam Catamaran Workboat: Commonly used in oil spill cleanups, adapted for floating vegetation collection



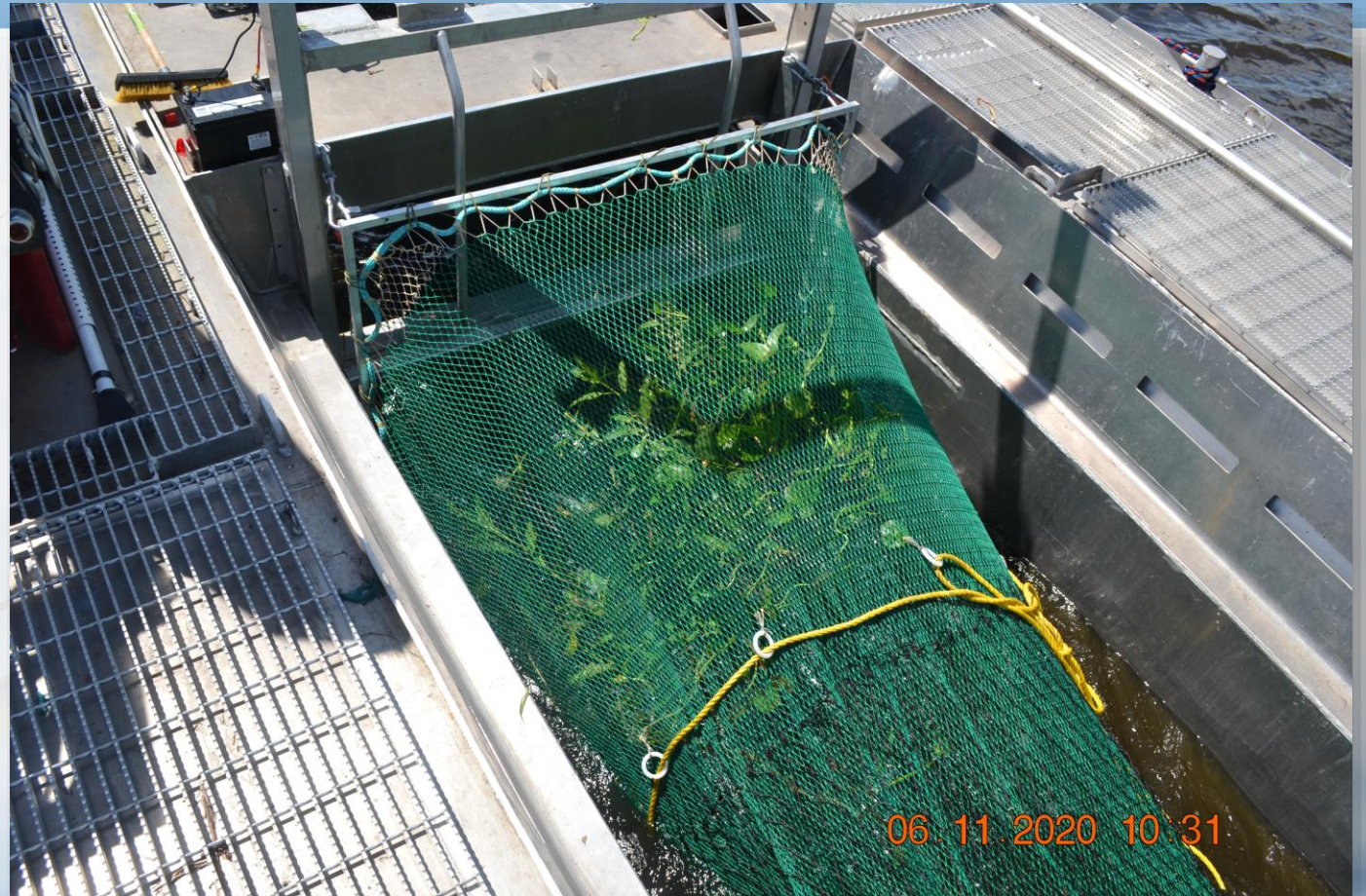
Expanding Arms

The arms in front of the bow help corral FAV between the hulls to the mouth of the MERV where it enters the net for harvest



Opening or “mouth” of Net

- Aluminum frame at mouth attaches to a bracket near the bow
- Bracket can be adjusted up or down to raise or lower frame to better fit different sized mats of FAV and/or operate in different depths
- Ropes near the middle allow the nets to keep a cone shape to prevent over filling and becoming lodged between hulls and motors



Weedoo AKA Tiger cat



The Tiger Cat breaks the larger mats of FAV into smaller pieces allowing the MERV to fit them into the "mouth" of the net.

They can also navigate in shallower water due to their air-cooled engine and lighter weight.

Great for retrieving FAV near shorelines to deeper water for MERV to harvest

MERV and Weedoo Working Together



The Tiger Cat can bring the FAV to deeper water for the MERV to collect.

21 Rule: 7 nets on MERV waiting to be filled, 7 nets adrift or in tow to the crane by Weedooos, 7 nets on land being dumped and prepared to transport back to MERV.

Contractor Claim: 21nets of FAV harvested every 1.5 hours.

Towing the filled net to the Crane



Crane



The crane retrieves the net full of vegetation and lifts it out of the water and on to the spoil pile. The crane stalled several times due to the weight of the nets.

VIDEO



Here you can see the Weedoo bringing FAV from the shoreline to deeper water for the MERV to harvest. The square frame seen at the front of the net limits the size of FAV mat that can be harvested at one time. Some plants with deeper/denser root structure can get caught on the bottom rail of the frame.

Versatility

- Shallow draft of 1.5 feet is ideal for lake O and other South Florida conditions
- Conveyor belt option for transferring FAV directly to barge
- Alternative air-cooled engines to eliminate the need for water intake in muddy conditions
- Sediment removal/syphoning from culverts, ditches etc.
- Alternative net available without metal frame

MERV Assessment Form

Completed by multiple interagency staff that attended the MERV Demo.

This averaged everyone's opinion of different capabilities of the MERV.

Comments and suggestions were also recorded.

MERV DEMONSTRATION 6/11/2020 INTERAGENCY ASSESSMENT FORM

The purpose of this document is to assess the use of the MERV and to determine if it has a place in mechanical removal of invasive plants on Lake Okeechobee and other managed water bodies. **P=Poor, S=Satisfactory, G=Good**

Factor	P	S	G	Comments
Mobility of machine	☐	☐	☒	MERV seems to be able to turn well in the water, but mobility is limited in muck with outboard motors. Different motor configuration is possible
Efficiency in collecting floating material	☐	☒	☐	Only for free-floating plants; plants must be broken up by <u>weedoos</u> /airboat before collection; collection limited by plant size and frame size
Precision of collection	☐	☐	☒	Extended arms on the front of the MERV allow it to corral plant mats
Speed of operation	☒	☐	☐	Takes considerable time to attach, fill, detach, collect, and unload net. Engineer said it could do 21 nets in 1.5 <u>hours</u> but we don't see this as possible considering it took 10 mins to load a net on the MERV
Load size	☒	☐	☐	3500 <u>lb</u> /net; not a lot when you consider water weight. Small crane had difficulty lifting full nets out of the water to unload.
Mobility of chain of containers	☐	☐	☐	Not demonstrated. Containers were left floating in the water to be collected by a <u>weeadoo</u>
Transport of material to shore	☐	☒	☐	Collection and transport of the nets to shore by <u>weedoos</u> was slow, could potentially use an airboat for this to speed it up. OK in small-scale demonstration but not for scale we need
Ease of unloading	☐	☒	☐	Labor intensive but straightforward. Crane had difficulty with load size, took multiple crew members to shake out material in net

MERV has a niche but is limited

Pros

- Shallower water than Harvester
- Air-cooled motors coming
- Versatility
- New innovative technology
- Mobility
- Contractor is willing to make adjustments to equipment for the district's needs

Cons

- Limited capacity
- Crane troubles
- Only able to collect free floating plants
- Slow operation
- Nets are cumbersome
- Need for multiple vehicles (weedoos) to complete operation

Breen Acres Aquatics

- MERV Brochure and Specs:
[file:///whqhhome01p/home\\$/wwilkers/docs/Custom%20Office%20Templates/MERV/5cc6f97ed9da337b7f863317_MERV-Brochure-MK2.7-5-2019.pdf](file:///whqhhome01p/home$/wwilkers/docs/Custom%20Office%20Templates/MERV/5cc6f97ed9da337b7f863317_MERV-Brochure-MK2.7-5-2019.pdf)
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