



TRI-COUNTY LAKES ADMINISTRATIVE COMMISSION

Aquatic Vegetation Management Plan for Smith Mountain Lake - 2025

Background:

Since 2002, the Tri-County Lakes Administrative Commission (TLAC) has managed a proactive and aggressive program to manage/control invasive aquatic vegetation species at Smith Mountain Lake (SML) through the use of systemic and contact herbicides and Triploid (sterile) Grass Carp. This program has included annual monitoring and surveys. A moderate amount of aquatic vegetation growth is very beneficial to the environment, but invasive aquatic vegetation species negatively affect freshwater ecosystems by disturbing the environment and interfering with water uses.

Curlyleaf pondweed, an invasive submersed aquatic vegetation species, was first identified in SML in 2002. In 2006, a more aggressive invasive species, Brazilian elodea, was found in the lake and in 2007 Hydrilla, one of the most aggressive invasive species was identified in the lake. In 2011, the acreage of Hydrilla infestations more than doubled. During the vegetation growing season in 2012, as the expansion clearly continued, the Virginia Department of Wildlife Resources (DWR approved the use of sterile grass carp as a part of SML's Aquatic Vegetation Management Program for 2013.

In the fall of 2012, TLAC hired SOLitude Lake Management to prepare a sterile grass carp management plan proposal that would include options available for consideration of this program at SML and the details needed to assist in TLAC's decision-making. Portions of this document (reference?) are taken from that proposal.

Summary of Invasive Aquatic Vegetation Species found at Smith Mountain Lake:

Hydrilla (*Hydrilla verticillata*), native to Asia, was first discovered in the United States in the 1960's. Since then, it has spread rapidly throughout freshwater resources and has disrupted the natural balance of numerous water bodies. Hydrilla reproduces through fragmentation, tubers, turions and seed. Hydrilla grows in dense mats capable of establishing in water greater than 20 feet deep. Hydrilla's ability to spread rapidly is a major concern for freshwater systems and usually requires management once detected. If left unmanaged, Hydrilla negatively affects boating, swimming, access, and aesthetics at SML. Left unmanaged, Hydrilla could choke out the perimeter of SML and create access issues.

Brazilian elodea (*Egeria densa*), native to Brazil, is an invasive plant that was introduced to the United States through the aquarium industry. Brazilian elodea can develop large mats that float to the surface. These mats crowd out other native species that grow more slowly. This plant can interfere with boating, swimming, and aesthetics. One plant can easily be dispersed over much of the lake just from recreational disturbances.

Curlyleaf pondweed (*Potamogeton crispus*) is an early season plant, capable of growing in cold water and gaining an advantage over native vegetation species that start growing at warmer water temperatures. It can grow in dense mats, possibly outcompeting and crowding out native plants. Once it dies, sections of the plant float to the surface and drift into shallow water and could create thick mats and inhibit recreation.

Goals:

The Tri-County Lakes Administrative Commission's (TLAC) goal for the management of aquatic vegetation species at SML has been to limit the invasive species' impact on boating, swimming, and aesthetics at the lake by limiting the invasive submerged aquatic vegetation without totally eradicating the native and nuisance submerged aquatic vegetation. Available funding shall be considered annually as TLAC determines the actions to be taken for the control and management of invasive aquatic vegetation at SML. Based upon the growing conditions within SML and the growth habits of invasive species identified in SML, the primary invasive species to be managed is hydrilla.

Control/Management Triggers:

The conditions indicating the need to actively manage invasive aquatic vegetation in SML will include one or more of the following:

- An area vegetated by invasive aquatic vegetation.
- An area affected by invasive aquatic vegetation that is negatively impacting boating, swimming, access, and aesthetics
- Identification of invasive aquatic vegetation on ≥ 500 feet of shoreline or more (cumulative)

Control/Management Options:

TLAC periodically consults with DWR for expertise regarding aquatic vegetation management approaches. The 2013 Hydrilla response references the stocking of sterile grass carp as the primary method of control. Herbicide treatments should only be used in situations where specific criteria are met.

Sterile Grass Carp Stocking Considerations:

The sterile grass carp is a large fish within the minnow family *Cyprinidae*. It is native to eastern Asia and was introduced into the United States in the 1960's to control aquatic vegetation. Sterile grass carp are commonly stocked throughout the United States to control submerged aquatic vegetation and are federally regulated. They are herbaceous fish that prefer soft vegetation species such as Hydrilla. Grass carp generally live only 10 – 12 years according to DWR biologists. Stocking sterile grass carp is a more financially sustainable option than herbicide treatment.

The DWR first approved the introduction of sterile grass carp at SML in the Spring of 2013. The sterile grass carp have suppressed native and invasive vegetation growth in SML from 2013 through 2023 and have prevented invasive vegetation from exceeding the control/management triggers. The sterile grass carp population established in 2013 successfully met the control measures needed at SML, but as they continue aging their effectiveness becomes diminished.

Sterile Grass Carp Methodology:

Successful introduction of sterile grass carp into lakes, with the intention to suppress invasive submerged aquatic vegetation growth without eradicating all submerged aquatic vegetation species, is a gradual process. It is very important not to overstock the sterile grass carp which can result in eradication of all submerged vegetation. The process of determining the initial stocking rate should consider many variables, including the number of vegetated acres, the plant canopy height, and vegetation density. To reduce the chances of overstocking, it is important to consider increasing the sterile grass carp population over the course of multiple years, based upon the success of aquatic vegetation management.

Comparing new submerged aquatic vegetation coverage data collected each year to past data is necessary to accurately determine if the vegetation levels are increasing or decreasing.

The annual stocking rate will be determined in the fall/winter of the preceding year, after the completion and compilation of the monitoring data for that year's vegetation growing season. That information, along with data showing the increase or decrease in vegetation compared to the previous year, will determine grass carp stocking rates, if required.

At SML, sterile grass carp should be stocked during the months of March and April. Purchasing the fish from a reputable supplier who is diligent at properly handling the fish and reducing stress on the fish is important.

Stocking 14+ inch fish which weigh approximately 2 pounds is ideal because the mortality rate will be low due to the lack of predators who can feed on such a large fish. If large fish availability is limited, the option to stock as many of the large sterile grass carp as the supplier can provide and then meet the remainder of the stocking needs with 12 to 14-inch fish which weigh 1-2 pounds should be considered. The bid should be awarded to the firm that can provide the optimal fish size for the best price that can properly handle such a large order.

Stocking Grass Carp:

Based on information collected through the monitoring and treatment programs, in 2013 SOLitude Lake Management, TLAC's consultant, estimated that there were approximately 1,054 vegetated (non-native) acres in SML. Using a stocking rate of 5-6 fish per vegetated acre, the number of sterile grass carp stocked in 2013 was 6,000 fish. This number was expected to be fairly conservative, with the goal of not overstocking the sterile grass carp.

Determination of Effectiveness of Sterile Grass Carp and Future Stocking Rates:

Monitoring the effectiveness of the sterile grass carp requires an annual vegetation survey. The primary purpose of the vegetation survey is to determine the number of vegetative acres that require control. Once the vegetative acres have been estimated, the population of sterile grass carp required to control the current growth can be calculated.

Herbicide Treatment Considerations:

- Herbicide treatment is expensive in comparison to the introduction of sterile grass carp.
- If herbicide is used, contact herbicide will be the preferred herbicide either in conjunction with or independently of the introduction of sterile grass carp. If used in conjunction with the introduction of sterile grass carp, herbicide use will inhibit the ability to measure the effectiveness of the grass carp and should be used sparingly. Herbicide treatment can be considered under the following circumstances:
 - High traffic areas with invasive infestations (boating activities may cause the plants to fragment and spread more rapidly throughout the lake), and
 - Stands of invasive vegetation found to be topping out, and/or whose growth exceeds the control/management triggers.
 - Small infestations where the introduction of grass carp is not appropriate (i.e., boat ramps, series of docks, swimming/park areas as needed)

Monitoring Strategies:

Implementing the best possible monitoring approach(es) is critical to control the invasive submerged aquatic vegetation. Monitoring efforts could be reduced as the invasive species stabilize at an acceptable level. The following monitoring strategies are expected to be utilized:

1. Continue the current weed rake sampling survey, annually, or as needed. This process involves mapping the invasive aquatic vegetation throughout the lake using the pre-established 1,700+ waypoints to identify native, nuisance and invasive species in the lake. Density, canopy height and size of bed data for all plant species will be recorded.
2. Monitor a selected number of areas of submerged aquatic vegetation using divers. The SML Association's Submerged Aquatic Vegetation Monitoring Program utilizes divers who will be able to identify the species, determine the water depth the submerged aquatic vegetation is growing in, and estimate bed surface area, density and canopy height. This monitoring method can provide knowledge of the vegetation species growing in deeper water along with confirming the data collected through the other monitoring methods. Documenting findings using underwater photography will be helpful when possible.

3. Other visual and weed rake toss reviews may be performed throughout the season, either by TLAC staff and/or through the SMLA's Submerged Aquatic Vegetation Monitoring Program, to collect additional data.
4. Continue the annual surveys of all previously identified locations of submerged aquatic vegetation.

Many variables will influence the sterile grass carp population required to meet TLAC's goals. This Management Plan is an adaptive management approach and will require annual revisions based on current survey information.

Fishing for Sterile Grass Carp:

Fishermen should be aware that "no possession (catch and release only)" applies to sterile grass carp at SML. Additional information is available in the VDWR's annual issue of "Freshwater Fishing and Boating in Virginia".

Outreach:

TLAC will continue to enhance its aquatic vegetation public outreach initiative begun in 2002. This program has been expanded to include presentations to local organizations and the preparation of new information/fact sheets for distribution. This program will emphasize use of the website, <https://tricountylakes.org> as a primary source for distributing up-to-date information.

TLAC Recommended Inspection Points

	LOCATION	MARKER VICINITY	LATITUDE	LONGITUDE
1	2 nd cove past Hales Ford Bridge, Franklin Cty. (Save Our Streams) created this ref# since there was no vegetation found @ CPR-11		37.1457690	-79.6781500
2	Arrowhead		37.052557	-79.624878
3	R47 Franklin County Side, Back of Cove		37.1791580	-79.7191350
4	BR3 Back of Little Bull Run		37.0028010	-79.6158100
5	BR3 Little Bull Run, Jefferson Boat Dock		37.0102750	-79.6221840
6	B4 Cool Branch		37.022118	-79.604458
7	B13 No Name Island		37.028598	-79.599165
8	B19 Virginia Key		37.039445	-79.66922
9	B10A End of Tracy Drive		37.060561	-79.641886
10	B19 Virginia Key		37.040982	-79.670492
11	B19 Piney Point Peninsula		37.042133	-79.671467
12	BR3 Little Bull Run		37.010244	-79.629982
13	Bull Run #1		37.01065	-79.642609
14	Bull Run #2		37.024678	-79.643808
15	Chimney Island		37.053894	-79.63794
16	Cool Branch		37.155290	-79.366691
17	Goodhue Blackwater (in back)		37.068264	-79.649069
18	Lucky Island		37.025136	-79.395184
19	Monte Vista		37.021148	-79.644659
20	Penhook		37.032682	-79.598002
21	R47 Bedford County		37.1790850	-79.7104300
22	R47 Franklin County, back of cove		37.1791580	-79.7191350
23	R6 Parkway Marina		37.051622	-79.582524
24	R18 SML State Park		37.0852850	-79.6060376
25	R18 SML State Park		37.085693	-79.605972
26	R18 SML State Park		37.079778	-79.614627
27	R21A Park Place		37.08765	-79.63257
28	R27 Betty's Creek		37.118942	-79.670699
29	Saddle Ridge, Water's Edge, LBR		37.0122080	-79.6173050
30	Sarah Cahill Cove, BR-3		37.0055650	-79.6132990
31	Silver Creek		37.035150	-79.65450
32	Water's Edge		37.012295	-79.617039
33	Waverly		37.057768	-79.637004
34	Year Round Shores, C-6		37.0888440	-79.5782570

Amended: EC Committee on May 1, 2018

Appendix: Annual Historical Timelines

2012-2013 Timeline:

November 2012	Release RFP for sterile (Triploid) grass carp stocking in 2013.
January 2013 VDWR).	Request official permit for sterile grass carp stocking from VDGIF (now Award the stocking contract to reserve the sterile grass carp with the supplier.
March / April	Stock sterile grass carp.
July / August	TLAC Staff and SMLA volunteer weed monitoring as needed.
September 2013	Utilize SMLA volunteer divers for monitoring selected areas. Complete survey.
October / November 2013	Evaluate the sterile grass carp population using the submerged aquatic vegetation monitoring data and determine the 2014 stocking rate.
November / December 2013	Release RFP for sterile grass carp stocking in 2014. <u>*Note: This was not required.</u>

2014 Timeline:

January 2014	Request official permit for sterile grass carp stocking from VDGIF (now VDWR). Award the stocking contract to reserve the sterile grass carp with the supplier. <u>Note: This was not required.</u>
March/April	Stock sterile grass carp <u>Note: This was not required.</u>
May – September	TLAC staff will accept aquatic vegetation reports. TLAC staff and TLAC Committee members will review areas with reports of aquatic vegetation.
September	Utilize SMLA volunteer divers for monitoring of selected areas.
October/November	Evaluate the sterile grass carp population using the aquatic vegetation monitoring data and determine the 2015 stocking rate.
December 2014	TLAC, VDGIF (now VDWR) and AEP representatives (now known as the SAV Oversight Committee) met to review the survey and monitoring data for 2014. Results were very positive that the sterile grass carp are still doing an excellent job of eating the invasive aquatic vegetation in SML. Decision was made NOT to recommend stocking any additional sterile grass carp in 2015.

2015 Timeline:

January – February 2015	TLAC Staff made recommendation to the TLAC Environmental Committee and TLAC Board NOT to stock additional sterile grass carp this year.
May – September	TLAC staff will accept aquatic vegetation reports from residents. <u>Note: There were no reports received.</u> TLAC staff and TLAC Environmental Committee members will review areas with reports of aquatic vegetation.
August	Utilize SMLA volunteer divers for monitoring of selected areas. <u>Note: No invasive vegetation was found.</u>
October - December	Evaluate the grass carp population using the aquatic vegetation monitoring data and determine the 2016 stocking rate. Schedule SAV Oversight Committee meeting for official recommendation.

2016 Timeline:

January – February 2016	TLAC Staff made recommendation to TLAC Environmental Committee and TLAC Board NOT to stock additional sterile grass carp this year.
May – September	TLAC staff will accept aquatic vegetation reports from residents. <u>Note: No reports were received.</u> TLAC staff and TLAC Environmental Committee members will review areas with reports of aquatic vegetation.
August	Utilized SMLA volunteer divers for monitoring of selected areas. <u>Note: No invasive vegetation was found.</u>
October – December 2016	Evaluate the grass carp population using the aquatic vegetation monitoring data and determine the 2017 stocking rate. Schedule SAV Oversight Committee meeting for official recommendation.

2017 Timeline:

January – February 2017	TLAC Staff made recommendation to TLAC Environmental Committee and TLAC Board NOT to stock additional sterile grass carp this year.
May – September	TLAC staff will accept aquatic vegetation reports from residents. <u>Note: No reports were received.</u> TLAC staff and TLAC Environmental Committee members will review areas with reports of aquatic vegetation.
August	Utilized SMLA volunteer divers for monitoring of selected areas. <u>Note: No invasive vegetation was found.</u>

October – December 2017 Evaluate the grass carp population using the aquatic vegetation monitoring data and determine the 2018 stocking rate.
Schedule SAV Oversight Committee meeting for official recommendation.

2018 Timeline:

January – May 2018 TLAC Staff made recommendation to TLAC Environmental Committee and TLAC Board **NOT** to stock additional sterile grass carp this year.

May – September 2018 TLAC staff will accept aquatic vegetation reports from residents.
Note: No reports were received.
TLAC staff and TLAC Environmental Committee members will review areas with reports of aquatic vegetation.

August 2018 Utilized SMLA volunteer divers for monitoring of selected areas.
Note: No invasive vegetation was found.

October – December 2018 Evaluate the grass carp population using the aquatic vegetation monitoring data and determine the 2019 stocking rate, if applicable.
Schedule SAV Oversight Committee meeting for official recommendation, if needed.

2019 Timeline:

January – May 2019 TLAC Staff made recommendation to TLAC Environmental Committee and TLAC Board **NOT** to stock additional sterile grass carp this year.

May – September 2019 TLAC staff will accept aquatic vegetation reports from residents.
Note: No reports were received.
TLAC staff and TLAC Environmental Committee members will review areas with reports of aquatic vegetation, if needed.

August 2019 Utilize SMLA volunteer divers for monitoring of selected area.
Note: Since no reports were received, divers did not perform the monitor dive.

October – December 2019 Evaluate the sterile grass carp population using the aquatic vegetation monitoring data and determine the 2020 stocking rate, if applicable.
Schedule SAV Oversight Committee meeting for official recommendation, if needed.

2020 Timeline:

January – May 2020 TLAC Staff made recommendation to TLAC Environmental Committee and TLAC Board **NOT** to stock additional sterile grass carp this year.

May – September 2020 TLAC staff will accept aquatic vegetation reports from residents.
Note: No reports were received.

TLAC staff and TLAC Environmental Committee members will review areas with reports of aquatic vegetation, if needed.

August 2020

Utilize SMLA volunteer divers for monitoring of selected area.

Note: There was no dive performed due to COVID-19.

October – December 2020

Evaluate the sterile grass carp population using the aquatic vegetation monitoring data and determine the 2021 stocking rate, if applicable. Schedule SAV Oversight Committee meeting for official recommendation, if needed.

2021 Timeline:

September 2021

SMLA divers surveyed 8 locations (surveyed in previous years) and determined there was no evidence of submerged aquatic vegetation.

2022 Timeline:

August 2022

TLAC Environmental Committee made a recommendation to the TLAC Board **NOT** to stock additional sterile grass carp this year.

May – September 2022

TLAC staff will accept aquatic vegetation reports from residents. TLAC staff and TLAC Environmental Committee members will review areas with reports of aquatic vegetation, if needed.

August 2022

Utilize SMLA volunteer divers for monitoring of selected area.

August 2022

TLAC Environmental Committee made a recommendation to the TLAC Board **NOT** to stock additional sterile grass carp this year.

2023 Timeline:

May – September 2023

TLAC staff will accept aquatic vegetation reports from residents. TLAC staff and TLAC Environmental Committee members will review areas with reported aquatic vegetation, if needed.

September 2023

SMLA divers surveyed 8 locations and determined there was no evidence of submerged aquatic vegetation.

September 2023

SMLA divers surveyed 13 locations, finding sparse vegetation in all locations. Some sites had more than one species present. Species found as follows:

- 3 sites - Coontail (native)
- 1 Site - Longleaf Pondweed (native)
- 1 Site - Slender Pondweed (native) 1 sites - Brittle Naiad, (non-native/invasive)

- 3 sites - Bladderwort (native)
- 11 sites - Brittle Naiad (non-native/invasive)

2024 Timeline:

May – September 2024	TLAC staff will accept aquatic vegetation reports from residents. TLAC staff and TLAC Environmental Committee members will review areas with reported aquatic vegetation, if needed.
September 2024	SMLA divers will survey 8 locations to determine evidence of submerged aquatic vegetation
October 2024 – April 2025	Evaluate the sterile grass carp population using the aquatic vegetation monitoring data and determine if additional stocking is required. Schedule SAV Oversight Committee meeting for official recommendation, if needed.

2025 Timeline:

May – September 2025	TLAC staff will accept aquatic vegetation reports from residents. TLAC staff and TLAC Environmental Committee members will review areas with reported aquatic vegetation, if needed.
September 2025	SMLA divers will survey 8 locations to determine evidence of submerged aquatic vegetation.
October 2025 – April 2026	Evaluate the sterile grass carp population using the aquatic vegetation monitoring data and determine if additional stocking is required. Schedule SAV Oversight Committee meeting for official recommendation, if needed.