



Reservoir Hydrilla Management Group 2021 Annual Report

Chesterfield County Utilities (CCU) has assisted in maintaining the water quality of Swift Creek Reservoir (SCR) through their primary control program for the invasive aquatic weed hydrilla. The recommended approach by renowned expert Dr. Kenneth Wagner is to achieve a balance with respect to allowing sufficient aquatic vegetation for a healthy reservoir by use of sterile grass carp; a natural consumer of hydrilla. By adding sterile grass carp, most often on an annual basis, a proper ecosystem can be maintained. It is important to note that hydrilla is the dominant species in the reservoir and the long-term goal is to establish a 10 to 25 percent reservoir aquatic vegetation bottom cover. This goal is in line with the Virginia Department of Wildlife Resources (DWR) recommendation of 20 to 30 percent vegetated cover for aquatic species and water body health. Secondary control is being worked on by the Reservoir Hydrilla Management Group (RHMG) specifically to develop travel lanes for boats to decrease propellor entanglement from hydrilla.

Reservoir Summary for Calendar Year 2021

In 2021, CCU added 1,250 sterile grass carp (12 to 18 inches in length) to the reservoir to maintain primary control of hydrilla. The 1,250 newly added sterile grass carp (grass carp) and the remaining grass carp from previous additions were unable to exert sufficient pressure needed for adequate hydrilla control. An unknown amount of grass carp was lost due to major floods in 2018 and 2020 that likely impacted grass carp populations more than estimated. Target primary control for hydrilla is 10 to 25 percent or 170 to 425 total acres and 259 to 648 effective acres (density weighted variable). The months of July, August, September, and October did not meet those targets. Those months ranged from 35 percent to 43 percent of total coverage and 981 to 1208 acres of effective coverage. To exert significant control, CCU consulted Dr. Wagner and requested that the current mathematical model assumptions be adjusted to account for the response seen in 2021. Dr. Wagner concluded that the two recent flood events had a more significant impact on the number of grass carp in the SCR and adjusted the model to account for those losses to exert adequate pressure going forward. For 2022 the recommendation is to increase the previous quantity of 800 grass carp to 3,500 grass carp, a 338 percent increase. This addition will be the second largest addition of grass carp to the reservoir. Dr. Wagner’s complete report can be found on the Swift Creek Reservoir [webpage](#) for Chesterfield County Department of Utilities. A summary of previous grass carp additions is found in the table below.

Grass Carp Stocking History		
Year	# Grass Carp	Size (in)
2010	10500	12
2011	0	0
2012	0	0
2013	0	0
2014	0	0
2015	1000	12-15
2016	3000	12-15
2017	0	0
2018	500	12-15
2019	600	12-18
2020	600	12-18
2021	1250	12-18

What to Expect for Calendar Year 2022?

Following last year's hydrilla regrowth, this year CCU and the RHMG opted for a more aggressive approach to primary control of hydrilla. There was complete winter die-back in 2021 and it is expected that the grass carp will keep pace with hydrilla growth at the beginning of the hydrilla growth season. CCU will install a more robust fish barrier designed to be more resilient to flood damage expected later in 2022. This investment by the CCU will allow a more stable number of grass carp to remain in the reservoir, especially during flood conditions. Hydrilla density is expected to decline from 2021 levels but may not get to program goals until 2023. It is expected that coverage will be similar or slightly below the levels experienced in 2015. Overall, the coverage may not decline to an acceptable target range in 2022 but should in 2023 once the 2022 carp added have attained 2 years in age.

When considering plant abundance, distribution, and the impact of grass carp stocking, it is important to keep in mind the inherent variability of biological populations and the many factors that affect their stability. Managing plants with biological controls is difficult but in the relatively small drinking water reservoir of SCR both the CCU and RHMG recognize the importance in not adding chemical herbicides. Grass carp offer an economic and ecologically sound method for primary hydrilla control. However too many carp can result in loss of all vegetation with the potential for resultant growth of noxious species such as blue green algae, etc. that from a water quality standpoint could be very detrimental to the long term survival of the reservoir. This makes determining the correct number of carp quite difficult. Other localized techniques can be applied as a secondary control where plant growth is too dense. Where the plant growth pattern is acceptable on a reservoir-wide basis, but shoreline access is restricted by denser growths, residents or property owner groups are encouraged to apply benthic barriers or to harvest areas to provide boat access. Application to an area between 10 and 14 feet wide and long enough to reach water >10 feet deep is allowed without a permit. Consideration may be given to using a mechanical harvester to clear areas of excessive vegetation. Mechanical harvesting is not feasible on a large scale in SCR, but with successful moderation of hydrilla abundance with grass carp, it could be an appropriate secondary technique if an electric powered machine is available to meet reservoir boat use requirements. Homeowners are encouraged to discuss with their Homeowner Associations and to work with the RHMG regarding interest in mechanical harvesting and the options that are available.