

CASE STUDY

Alligare FluridoneTM

Managing Hydrilla verticillata in Lake Grew



Background:

Lake Grew is a world championship ski lake located at the USA Water Ski Foundation Water Sports Complex near Polk City, Florida. It is a 30 acre man-made lake utilized exclusively for water ski training and tournaments. Hydrilla management is essential in a competition ski lake and Alligare's donation of Alligare Fluridone for this efficacy trial has enabled the Foundation to regain control of the Hydrilla infestation in Lake Grew.

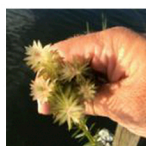
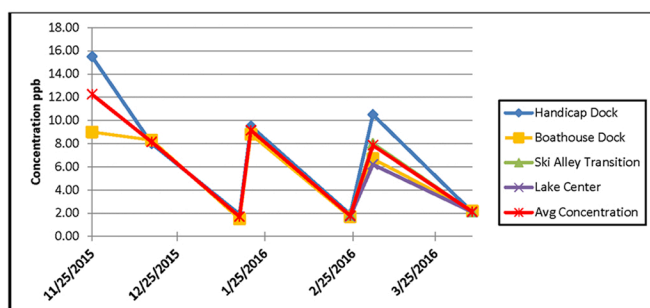
Monitoring Methods:

Monitoring submersed aquatic vegetation (SAV) treatments or trials can be quite challenging for a number of reasons. Documenting efficacy, selectivity, non-target impacts and longevity are key components for evaluation. With technology advances in recent years we now have the ability to rapidly collect data for these evaluations rather than rely on potentially biased observational or anecdotal evidence. Data collected for this trial include herbicide residue analysis, pre and post-treatment hydroacoustic mapping and CI BioBase processing, random rake toss surveys, and numerous photos.

Site	11/25/15	12/16/15	1/16/16	1/20/16	2/24/16	3/3/16	4/7/16
Handicap Dock	15.50	8.00	1.90	9.50	1.90	10.50	2.10
Boathouse Dock	9.00	8.30	1.50	8.80	1.69	6.70	2.20
Ski Alley Transition					1.83	8.00	2.10
Lake Center					1.73	6.20	2.10
Avg Concentration	12.25	8.15	1.70	9.15	1.79	7.85	2.13

Lake Grew was mapped with a Lowrance fathometer on November 18, 2015. This data was processed and analyzed by CI BioBase to determine the pre-treatment SAV coverage and biovolume. The process was repeated on April 7, 2016 to document the post-treatment SAV coverage and biovolume following successful Hydrilla management. The hydroacoustic data was collected following CI BioBase recommended settings and transect spacing of 25 meters, their default spacing for a lake of this size. Random rake tosses accompanied the hydroacoustic surveys to confirm what SAVs were present. Fluridone residue analysis is necessary to document herbicide concentrations, half-life and overall exposure duration. Water samples were collected 4 to 5 days after all 3 applications and then again approximately 1 month after each treatment. Local rainfall and runoff contributed to dose concentration dilution. All samples were collected at elbow depth in 250 ml brown Nalgene bottles. Samples were placed on ice temporarily and then refrigerated. Samples were shipped in cold packs via UPS to Waters Agricultural Laboratories, Inc. in Georgia for analysis. These results help guide the timing and number of additional applications necessary for optimum Hydrilla control.

Fluridone Residue Analysis:



Nov 25, 2015



Apr 7, 2016



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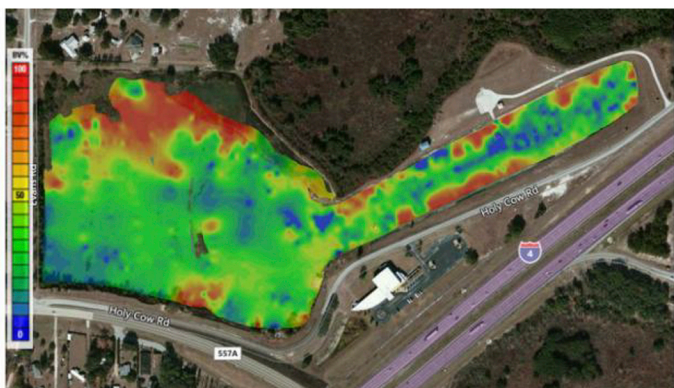
Results:

The initial herbicide concentration of 12.3 ppb was followed by typical degradation of approximately 30 days. The subsequent 8 ppb applications conducted on January 16, 2016 and February 28, 2016 yield average residues of 9.15 ppb and 7.85 ppb respectively. Overall continuous exposure of Fluridone was greater than 120 days exceeding the duration for typical spring or summer treatments, yet not atypical for a winter time Hydrilla treatment.

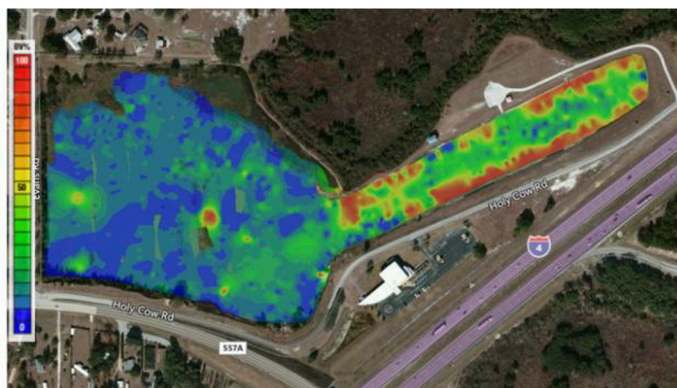
On November 18, 2015, the pre treatment SAV percent area coverage (PAC) was 97.9% and the average biovolume (Avg BV) was 38.8%. Hydrilla verticillata was the dominant SAV and Vallisneria americana was the only other SAV noted during this survey. On April 7, 2016, the post-treatment SAV PAC was 80.5% and the Avg BV was 19.0%. The 51% change in Avg BV represents the reduction in Hydrilla biomass in Lake Grew. Vallisneria americana was the dominant SAV in the post-treatment survey, appears to be expanding, and accounts for all the dense (red) SAV in the April 7, 2016 heat map. Hydrilla is no longer present in Ski Alley and difficult to find in the remainder of the lake. In fact, it comes in last in abundance behind Utricularia, Nitella and Chara species. Although no surprise, Fluridone symptoms were also observed another susceptible species, Nuphar advena.

The following images are CI BioBase pre and post-treatment vegetation heat maps with summary statistics.

Nov 18, 2015 PAC 97.9% Avg BV 38.8%



Apr 7, 2016 PAC 80.5% Avg BV 19.0%



Summary:

Alligare Fluridone has provided excellent control of the Hydrilla verticillata in Lake Grew. Although winter treatments inherently take longer due to the reduced plant activity and growth, treatment duration, herbicide degradation, efficacy and selectivity were all on par with a typical winter Fluridone treatment. Hydrilla biomass has been significantly reduced to the point that grass carp will no longer have a problem managing the regrowth. In conclusion, this Alligare Fluridone trial provided the opportunity for the USA Water Ski Foundation to regain control of the Hydrilla infestation in this world championship ski lake.

**To learn more about Alligare Fluridone,
call (888) 255-4427 or visit alligare.com today!**

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