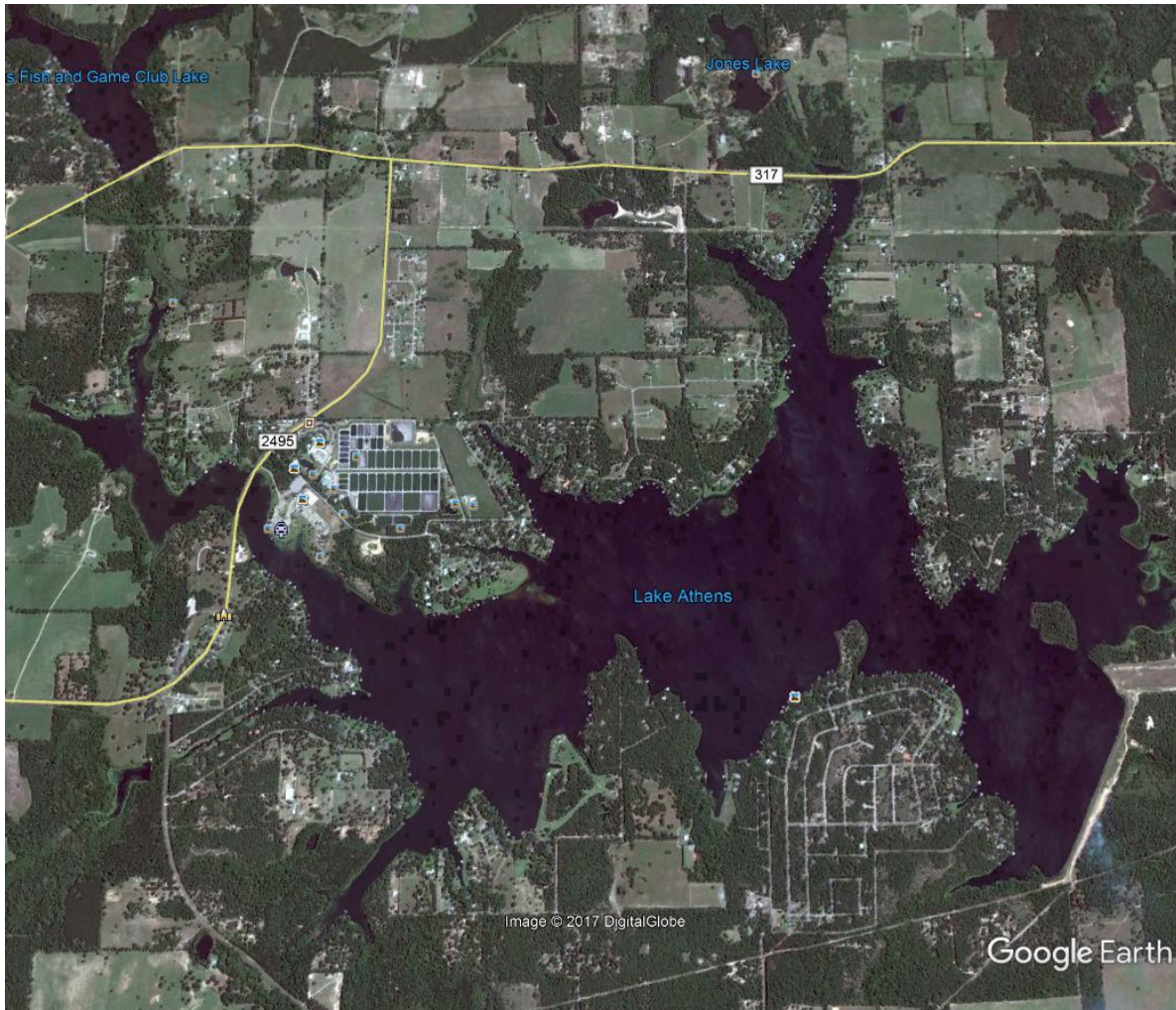


Aquatic Vegetation Management Plan For Lake Athens 2018



Spencer Dumont TPWD IF Region 1 Program Director
Dr. Richard Ott, TPWD IF District Supervisor
Jake Norman, TPWD IF Assistant Biologist
William Casey, AMWA Director
Gary Dugan, AMWA Patrol Officer

January 2018

Introduction

Lake Description

Lake Athens is a 1,799-acre reservoir constructed in 1962 on Flat Creek, a tributary of the Neches River, Texas, to supply water and recreation. The controlling authority is the Athens Municipal Water Authority (AMWA). Lake Athens is a public water body in Henderson County and home to the Texas Freshwater Fisheries Center (TFFC), a Texas Parks and Wildlife Department (TPWD) hatchery and education center. Conservation pool level (full pool) at Lake Athens is 440 feet above mean sea level (MSL). Public boat access is limited to two boat ramps at one access area (no fee required), and public bank angling access is restricted to the marina area and bridge crossings. No handicap-specific facilities currently exist, but the convenience pier at the marina allows wheelchair use.

Aquatic Vegetation History

Exotic aquatic vegetation has been present in Lake Athens since 1995. Hydrilla was first discovered in 1995, and coverage has been less than 125 acres since 2011 (Table 1). In spring 2012 an advisory group of property owners, anglers, AMWA, and TPWD met to create a Hydrilla management plan. Under this plan only Hydrilla would be treated and conditions, timing, spatial distribution, approved chemicals, and financial responsibility for treatment were all defined. Water Hyacinth was discovered in 2005 and removed by TPWD. Water Hyacinth is currently absent at Lake Athens. Alligatorweed is present and coverage has remained low and scattered. Alligatorweed flea beetles were released by TPWD in 2014 for Alligatorweed control (Figure 1).

A maximum coverage of all vegetation types (746 acres; including 123 acres of Hydrilla) occurred in summer 2011 following three years of stable water (Figure 2). Prolonged drought from 2011 through 2013 caused water level to drop (Figure 2), exposing over 500 acres of reservoir bottom (Figure 3). Desiccation reduced coverage of all aquatic plant species (including Hydrilla) to only 215 acres (15% of lake's surface area) in summer 2013 (Table 1); few, if any, treatments were conducted under the Hydrilla management plan at that time. From 2014 through July 2017 water level stabilized near the 440 ft. elevation (full pool), and the plant community recolonized previously exposed areas. A diverse native emergent and submersed aquatic plant community forms a beneficial fringe for fish and wildlife around the reservoir. In summer 2017 aquatic plant coverage was 368 acres (20.5% of the lake's surface area), within the target range of 20-40% for optimum fish production. Based on the current diversity and abundance of aquatic vegetation, no system-wide vegetation control actions were identified as priorities using TPWD resources. However, allowing property owners the flexibility to address their private access issues related to nuisance vegetation should have minimal negative impact on the existing aquatic vegetation community. See Figures 4 and 5 for detailed maps of vegetation in 2013 and 2017.

In February 2017 TPWD and AMWA representatives met with members of the Lake Athens Property Owners Association (LAPOA) to discuss how property owners (or their agents) could file Aquatic Vegetation Treatment Proposals (AVTP's) for shorefront vegetation control. By the end of the initial chemical treatment period in late May, individual chemical treatments for approximately 150 shore-front properties had been conducted removing approximately 65 acres of primarily native aquatic vegetation. Treatments for the remainder of the season were limited to mechanical treatment only at a maximum footprint of 5,625 square feet (75 ft. x 75 ft.).

Roles and Responsibilities

AMWA

The land at the bottom of Lake Athens and the shoreline around the lake to the 448 ft. MSL elevation is owned by AMWA. Raw water is sold by AMWA to the city of Athens for municipal water supply and provided to TFFC to support hatchery fish production. A \$33 permit is required by AMWA for any work done on AMWA property (i.e. piers & boathouses, dredging & excavation, retaining walls, aquatic vegetation management, etc.). The aquatic vegetation control application process is administered by AMWA in conjunction with TPWD's application process.

TPWD

TPWD is the State agency authorized by the Legislature to protect and conserve fish and fish and wildlife habitat in Texas' public waters. TPWD manages and conserves the natural and cultural resources of Texas to provide hunting, fishing, and outdoor recreation opportunities for the use and enjoyment of present and future generations. TPWD surveys aquatic resources and advises controlling authorities on aquatic vegetation management and recreational access. The TPWD Tyler South Fish Management team is responsible for the management and conservation of freshwater natural resources (13 major reservoirs, including Lake Athens) and

to provide fishing opportunities and boating/fishing access for present and future generations in a nine-county area near Tyler. TPWD's Inland Fisheries Division is funded with Federal Sport Fish Restoration dollars (via a tax on fishing equipment, boats, motors, and fuel) through the Fish and Wildlife Service and with state dollars derived through the sale of fishing licenses.

Property Owners and Anglers Serving on Advisory Committee

It is recognized that reservoir-based businesses and waterfront homeowners have been impacted by aquatic vegetation at Lake Athens. It is also recognized that the diverse native aquatic plant community in Lake Athens contributes to clear water, shoreline protection, and excellent Largemouth Bass, sunfish, and crappie fisheries, attracting water recreation users from all over the state and beyond. Collaboration among AMWA, property owners, anglers, and TPWD will be required if the aquatic habitat and fish populations are to be properly managed for sustainable access and multi-recreational use and enjoyment of the lake by all stakeholders. Input generated from property owners and anglers on the advisory committee (Appendix A) will assist in development of an aquatic vegetation management plan that is fair, equitable, maintains good fish habitat and water quality, and allows flexibility for property owners to address vegetation issues related to their recreational access. Members of the advisory committee are responsible for relaying information about the Lake Athens Aquatic Vegetation Management Plan to the stakeholders they represent. This management plan will be in effect until November 1st, 2018 when the plan will be re-evaluated by the committee. In the event that a major change is needed to the Lake Athens Aquatic Vegetation Management Plan prior to November 1st, 2018, the advisory committee will be consulted for input.

Aquatic Vegetation Treatment Application Process

At the direction of the Texas Legislature, the Texas Commission on Environmental Quality (TCEQ), the Texas Department of Agriculture (TDA), and TPWD developed a Statewide Aquatic Vegetation Management Plan (State Plan) to guide decision making regarding nuisance aquatic vegetation in public water. The TDA regulates pesticide use in the State of Texas, and TCEQ regulates water for human consumption, and (as stated above) TPWD manages fish and wildlife habitat. The list of herbicides provided in the Statewide Aquatic Vegetation Management Plan is the result of collaboration between TPWD, TDA, and TCEQ. Per state law TPWD is the State agency responsible for the implementation of the Statewide Aquatic Vegetation Management Plan.

Per the State Plan, an AVTP is required to legally remove aquatic vegetation in a public water body. A blank AVTP form and example plan are provided in Appendix B. Proposed AVTP's are reviewed by AMWA and TPWD to ensure that legal, best practices are followed and treatment actions do not damage our natural resources or endanger resource users. For details of the State Plan, see Aquatic Vegetation Management in Texas: A Guidance Document http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_pl_t3200_1066.pdf. In addition to the AVTP, an Exotic Species Permit for Aquatic Vegetation Removal (AVR) is required to possess any prohibited species subsequent to mechanical removal. https://tpwd.texas.gov/huntwild/wild/species/exotic/prohibited_aquatic.phtml.

A flow chart on "How to Apply for Aquatic Vegetation Treatment" (Appendix C) provides a simple diagram of the application process for the AVTP and the AVR. For any AVTP to be accepted, both AMWA and TPWD must agree. AVTPs will be accepted for review from March 1st to May 31st annually with NO EXCEPTIONS. An AMWA permit, AVTP, and AVR (if necessary) is required for each individual property. Contractors or individuals actually applying the treatment (mechanical or chemical) are responsible for the accuracy of the information provided on the AVTP and AVR.

Aquatic Vegetation Management Process

Herbicide treatments

To be effective, herbicide treatments should begin after water temperature reaches 65° F. Herbicide treatments by certified commercial applicators, per approved AVTP, can occur throughout the growing season during defined time periods listed below. Time periods were selected to correspond with major holidays (Memorial Day, Independence Day, Labor Day) to allow for aquatic vegetation control prior to the holiday. **Note: Treatment outside the designated treatment time periods may be approved by AMWA and TPWD if extenuating circumstances (i.e. weather, natural disaster) prevented treatment during a designated time period.**

Mechanical Treatments

Mechanical treatments can be conducted at any time for up to six months following approval of an AVTP. If prohibited species are to be removed (i.e. Alligatorweed, Hydrilla, Water Hyacinth) an AVR permit is required. (See Appendix C for details).

Treatment Footprint

TPWD will generally approve treatment of aquatic vegetation from the 440 ft. MSL contour (elevation along the bank) to the 434 ft. MSL contour (six feet deep at full pool) or up to 75 feet from the 440 ft. MSL contour (75 feet from full-pool shoreline). In most cases this will provide recreational and boating access while maintaining fish and wildlife habitat. In special cases such as in the backs of coves or on long, shallow flats where access to open water is prevented by nuisance vegetation, AVTPs proposing treatment beyond the 434 ft. elevation or 75 ft. distance will be evaluated by AMWA and TPWD on a case-by-case basis.

Aquatic Vegetation Management Schedule

January 1st – May 31st, 2018

- Solicit bids and hire contractors to conduct herbicide treatment, mechanical treatment, or both.
- TPWD will provide vegetation survey results conducted in summer 2017 for use in preparing AVTPs; included in this document and posted on AMWA's web site.
- Contractors can conduct pre-treatment vegetation surveys in areas to be treated.
- Contractors can prepare AVTPs and AVRs (if necessary) defining footprint, chemicals to be used or mechanical treatment techniques. **NOTE: Use example AVTP in Appendix B as the template.**

March 1st – May 31st, 2018

- Submit completed AMWA permit application, AVTP, and AVR (if applicable) applications and supporting materials to AMWA for review and approval no later than May 31st. Upon approval, AMWA will submit to TPWD for review and approval. **NOTE: See Appendix A for detailed application process flow chart.**
- Mechanical treatment may be conducted at any time for up to six months following notification of an accepted AVTP and, if necessary, AVR permit.
- First herbicide treatment time period is May 7th – May 18th, 2018. **NOTE: In order to qualify for herbicide treatment during the first time period, the AVTP must be submitted by April 23rd to allow sufficient time for review of AVTPs, to notify persons on the Statewide notification list https://tpwd.texas.gov/landwater/water/enviroconcerns/nuisance_plants/notification_list.phtml , and to notify water users (if needed; dependent on chemical).**

June 1st – October 31st, 2018

- Second herbicide treatment time period is June 11th - June 22nd, 2018.
- Last herbicide treatment time period is August 13th – August 24th, 2018.

November 1st – December 20st, 2018

- Advisory committee will meet to discuss 2018 process and address any needed changes for 2019.

Table 1. Surveys of aquatic vegetation, Lake Athens, 2011 – 2017. Surface area (acres) is listed by plant species with percent of total reservoir surface area occupied in parentheses.

Year	2011	2012	2013	2017
Reservoir area during survey	1,539	1,658	1,392	1,790
Native submersed				
Pondweed	27 (1.7)	38 (2.0)	31 (2.2)	57 (3.2)
Coontail	490 (31.8)	525 (32.6)	25 (1.8)	109 (6.1)
Wild celery	40 (2.6)	1 (<0.1)	24 (1.7)	53 (3.0)
Chara (alga)	39 (2.5)		25 (1.8)	19 (1.1)
Lyngbya (alga)			1 (<0.1)	
Native floating-leaved				
American Lotus	20 (1.3)	39 (2.4)	90 (6.4)	117 (6.5)
White water-lily	7 (0.5)	6 (<0.1)	2 (<0.1)	3 (0.2)
Native Emergent				
Cattail			<1 (<0.1)	
Giant cutgrass				2 (0.1)
Water primrose			<1 (<0.1)	
Panic grasses				1 (<0.1)
Water willow			<1 (<0.1)	1 (<0.1)
Non-native				
Alligator weed (Tier II)*	<1.0 (<0.1)	28 (1.7)		5 (0.3)
Hydrilla (Tier III)*	123 (8.0)	10 (0.6)	<1 (<0.1)	1 (<0.1)
Total (% coverage)	746 (48)	647 (39)	215 (15)	368 (20)

*Tier I is immediate Response, Tier II is management status, Tier III is Watch Status



Figure 1. Release sites of Alligatorweed flea beetles at Lake Athens, 2014.

USGS 08031290 Lk Athens nr Athens, TX

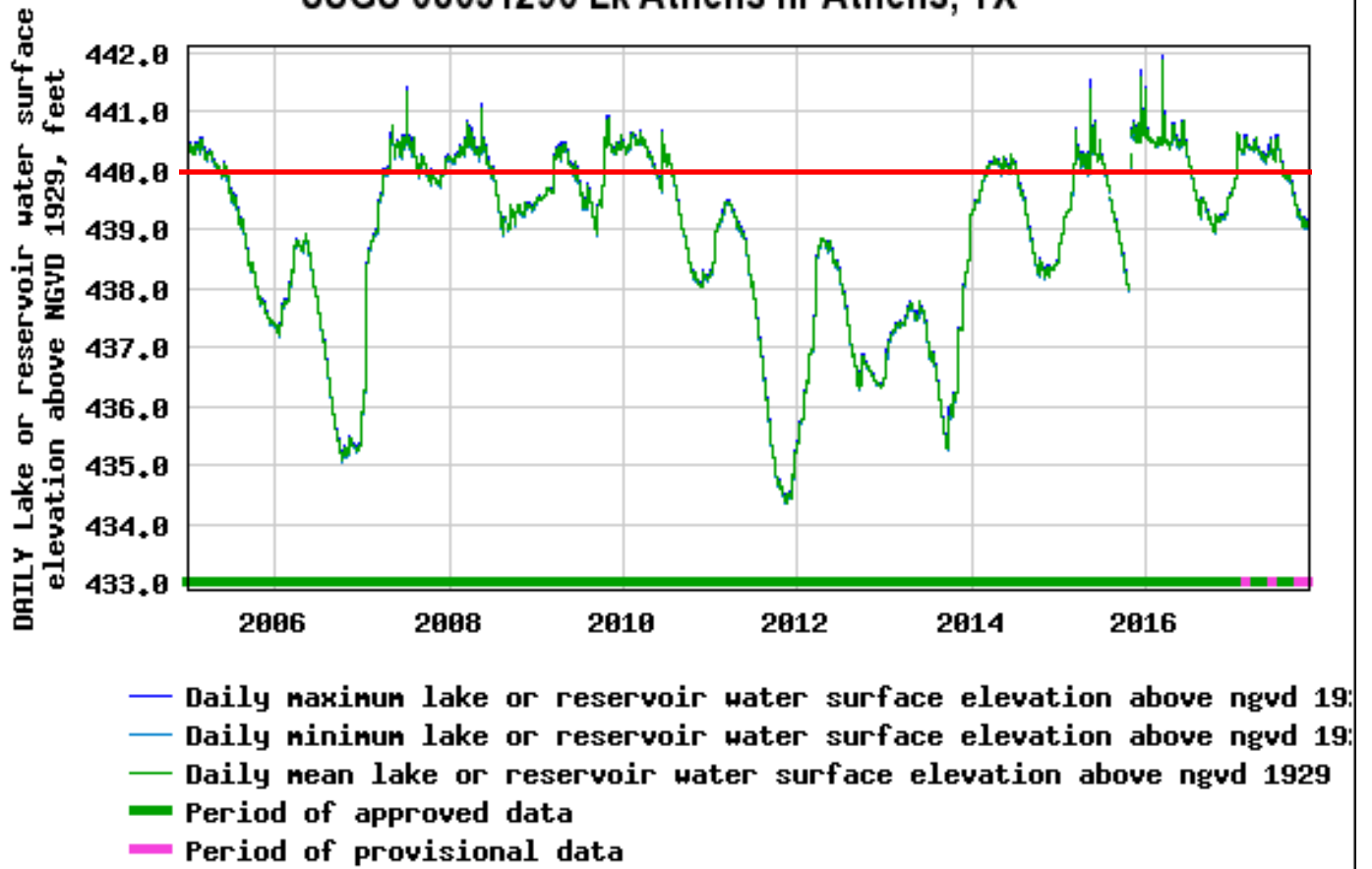


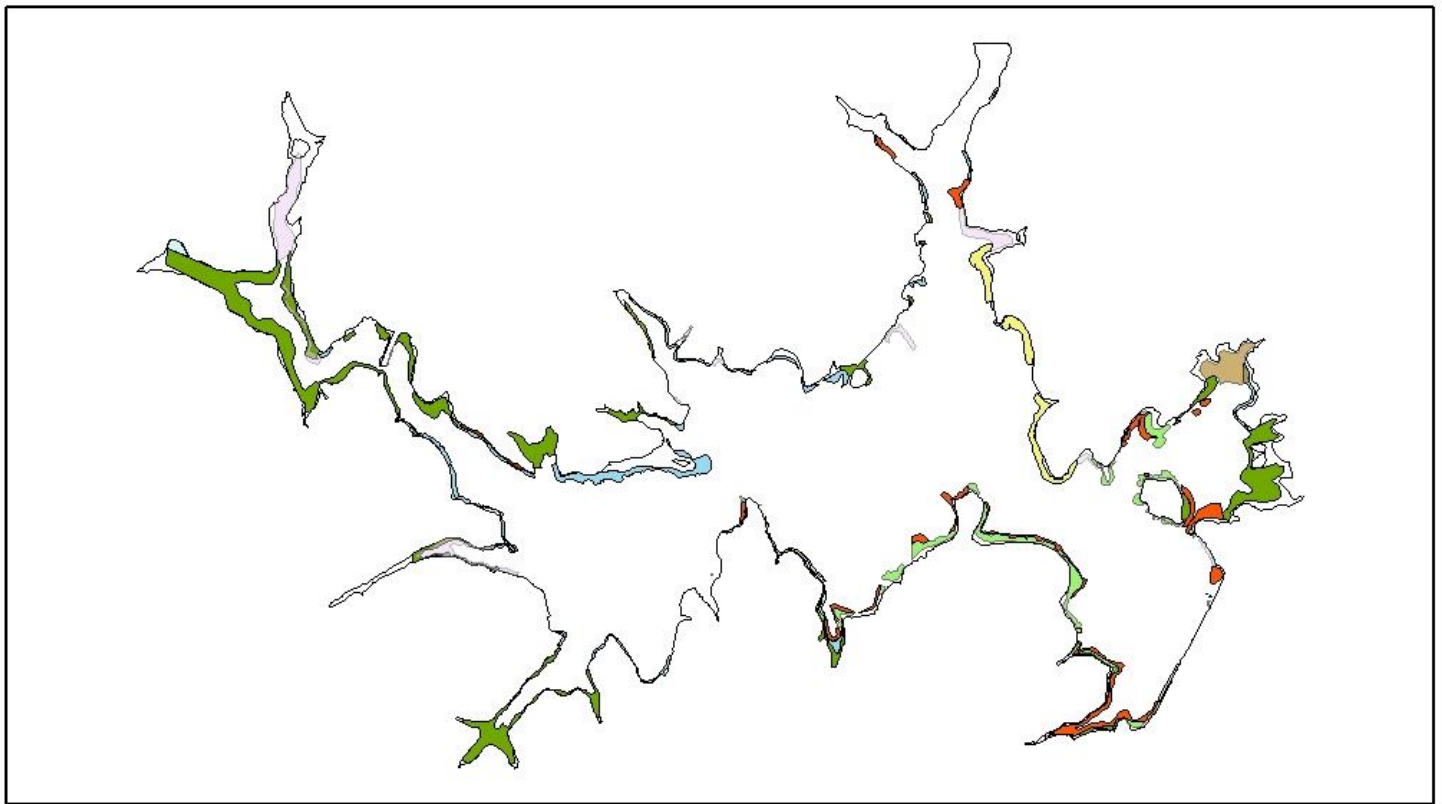
Figure 2. Water level for Lake Athens (2005-2017). Red line represents conservation pool level (440 ft. MSL).



Figure 3. Google Earth image from October 17, 2012 showing extensive reservoir bottom exposure due to low water from the extended drought.

Lake Athens Vegetation Survey 08/05/2013

Current Surface Acreage ~ 1392 Acres



<p>Inland Fisheries Division Texas Parks and Wildlife Department</p> <p><small>Prepared by: Jacob Norman & Richard O II Texas Parks and Wildlife - Inland Fisheries Division Projections: NAD 83 UTM Zone 15N This Map is for Reference Only The reader must be aware of data conditions and ultimately bear responsibility for the appropriate use of the information with respect to possible errors, original map scale, collection methodology, currency of data, and other conditions specific to certain data.</small></p>	<p>Species ~ Acreage</p> <p>Total Coverage ~ 214.8 Acres: 15% Lake Coverage</p> <table border="0" style="width: 100%; font-size: small;"> <tr> <td style="width: 33%;">Lotus ~ 89.7</td> <td style="width: 33%;">Coontail/Hydrilla Mix ~ 1.4</td> <td style="width: 33%;">Nitella ~ 8.7</td> </tr> <tr> <td>Pondweed ~ 31.3</td> <td>Cattail ~ 1</td> <td>Water Willow < 1</td> </tr> <tr> <td>Coontail ~ 24.6</td> <td>Chara ~ 25.3</td> <td>White Water Lily ~ 1.8</td> </tr> <tr> <td>Wild Celery ~ 24.0</td> <td>Coontail/Chara Mix ~ 12.8</td> <td>Primrose < 1</td> </tr> <tr> <td>Hydrilla < 1</td> <td>Lyngbia ~ 1.2</td> <td></td> </tr> </table>	Lotus ~ 89.7	Coontail/Hydrilla Mix ~ 1.4	Nitella ~ 8.7	Pondweed ~ 31.3	Cattail ~ 1	Water Willow < 1	Coontail ~ 24.6	Chara ~ 25.3	White Water Lily ~ 1.8	Wild Celery ~ 24.0	Coontail/Chara Mix ~ 12.8	Primrose < 1	Hydrilla < 1	Lyngbia ~ 1.2		<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p>550 Meters</p> </div> <div style="text-align: center; margin-top: 10px;"> <p>N</p> </div> <div style="text-align: right; margin-top: 10px;"> </div>
Lotus ~ 89.7	Coontail/Hydrilla Mix ~ 1.4	Nitella ~ 8.7															
Pondweed ~ 31.3	Cattail ~ 1	Water Willow < 1															
Coontail ~ 24.6	Chara ~ 25.3	White Water Lily ~ 1.8															
Wild Celery ~ 24.0	Coontail/Chara Mix ~ 12.8	Primrose < 1															
Hydrilla < 1	Lyngbia ~ 1.2																

Figure 4. Comprehensive aquatic vegetation surveys at Lake Athens (2013).

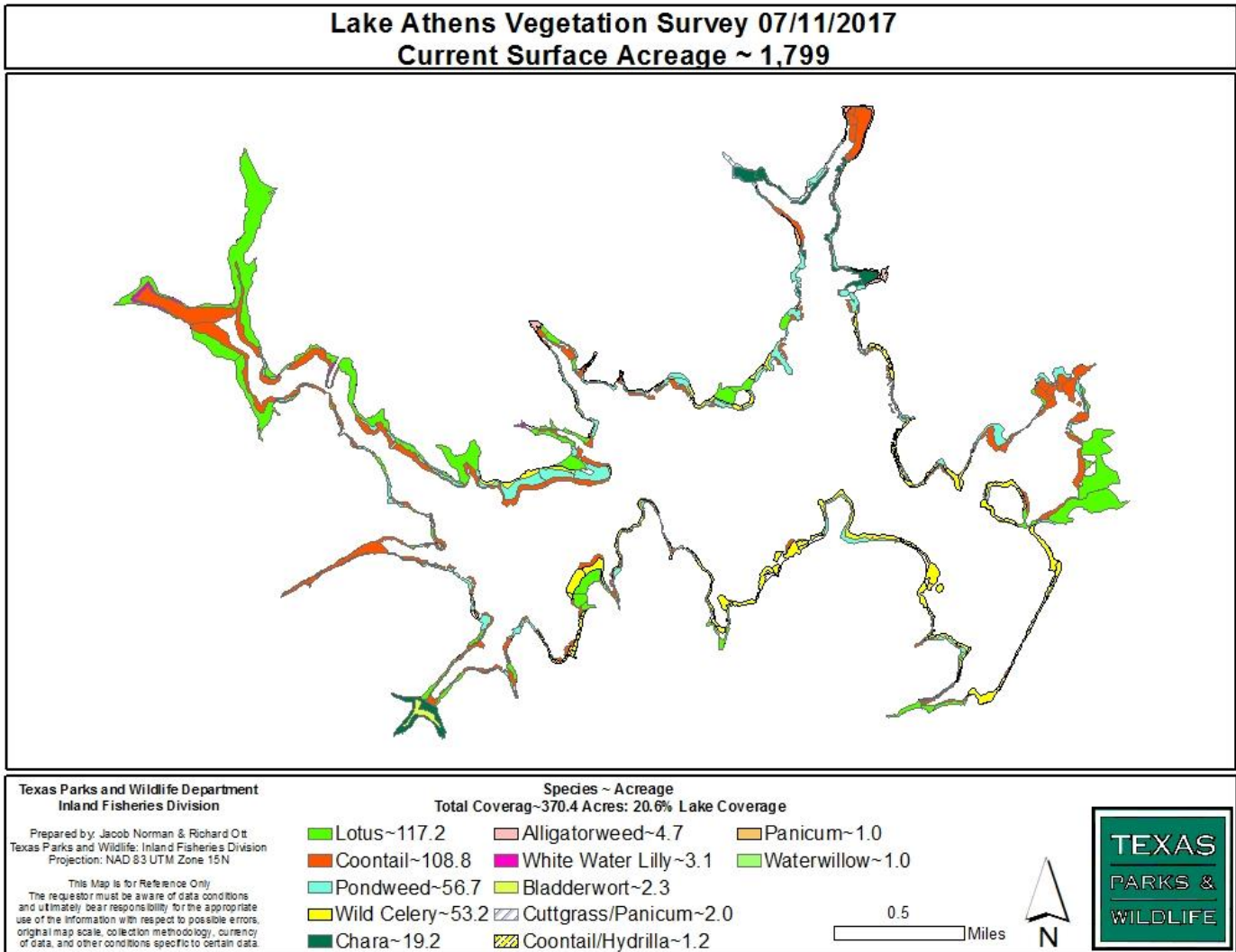


Figure 5. Comprehensive aquatic vegetation surveys at Lake Athens (2017).

Appendix A

2018 Lake Athens Stakeholders Roster

Name	Representing	Email Address
Bill Casey	AMWA	director@athenstxwater.org
Gary Dugan	AMWA	patrol@athenstxwater.org
Spencer Dumont	TPWD	spencer.dumont@tpwd.texas.gov
Richard Ott	TPWD	richard.ott@tpwd.texas.gov
Jake Norman	TPWD	jake.norman@tpwd.texas.gov
Ken Geeslin	Lakefront Shores HOA	kgeeslin@henderson-county.com
Rod Dent	Rose Pointe HOA	rodneyd2255@gmail.com
Scott Schoenvogel	LAPOA	scotts@compassphs.com
Tom Harrison	LAPOA	tomh@colemanharrison.com
Jane Nettune	LAPOA	mnettune@gmail.com
Glenn Martin	Anglers	fisherman81466@gmail.com
Josh Glasgow	Anglers	jglasgow@abiomed.com
Dakota Jones	Anglers	dakotajonesfishing@gmail.com
Jim Brack	Anglers	Jrb8495698@yahoo.com
Brian Hughes	Anglers	tofishtx@aol.com



Aquatic Vegetation Management in Texas: A Guidance Document

Appendix C. Aquatic Vegetation Treatment Proposal Form

Form Instructions: Please fill in all of the following information completely and write legibly. A map of the waterbody with marked or delineated proposed treatment sites must be attached to the treatment proposal or processing may be delayed. The permit application on the next page must be completed if [prohibited exotic vegetation](#) will be mechanically removed.

Water Body Name: _____ Water Body Type(s): Lake/Reservoir River/Creek

Submitted By: _____ Submission Date: _____

Property Owner: _____ Contact Person: _____

Contact Phone: _____ Contact Email: _____

Treatment Site Physical Address ([attach map](#)): _____

Date Surveyed: _____ Proposed Treatment Start & End Dates:* _____ TO _____

Aquatic Vegetation Type(s) - **Please Check ALL That Apply:** Floating Emergent Submerged

Concern Tier – **Please Check ONE:** Immediate Response (Tier I) Maintenance (Tier II) Watch Status (Tier III)

Estimated Vegetation Coverage (Acres OR Shoreline Distance) To Be Treated: _____ Average Water Depth: _____ ft.

Proposed Treatment Type(s) - **Please check ALL that apply:** Mechanical Biological Chemical

Herbicide Applicator Name: _____ Applicator License Number: _____

Enter Each Target Aquatic Vegetation Species Name On A Separate Row In Table Below. ** Also Enter All Surfactants In Table.

Aquatic Vegetation Species <small>Enter one species per row.</small>	Chemical Treatment Brand Name(s) / Active Ingredient(s) <small>Enter one per row; use separate row for each surfactant.</small>	Method/ Form of Treatment <small>Chemical spray, granular chemical, mechanical/cutting, biological control, etc.</small>	Treatment Site Description <small>Shoreline, cove, river/creek, etc.</small>	Treatment Area <small>Enter as acres, acre-feet, or shoreline distance for river/creek; give unit of measure).</small>	Percent Coverage <small>Enter as percent of treatment area.***</small>	Chemical Treatment Rate <small>Rate per acre or acre-foot (or per gallon***); give unit of measure</small>	Total Treatment Used <small>Multiply rate X area***</small>
					%		
					%		
					%		
					%		
					%		
					%		
					%		

Comments: _____

*Approved proposals authorize treatments (up to the maximum acreage proposed) until December 31st of the year the proposal was approved, provided compliance with requirements for notices of intent to apply aquatic herbicide and all applicable local or other regulations/requirements.

**Use Additional Copies Of This Form If Needed.

***Chemical Treatment Of Individual Patches of Riparian Nuisance Vegetation Intermittently Distributed Along a River or Creek Enter "Spot Treatment."



Aquatic Vegetation Management in Texas: A Guidance Document

Appendix C. Aquatic Vegetation Treatment Proposal Form

Form Instructions: Please fill in all of the following information completely and write legibly. A map of the waterbody with marked or delineated proposed treatment sites must be attached to the treatment proposal or processing may be delayed. The permit application on the next page must be completed if prohibited exotic vegetation will be mechanically removed.

Water Body Name: Lake Athens Water Body Type(s): Lake/Reservoir River/Creek
 Submitted By: John Smith Submission Date: 04/19/2018
 Property Owner: John Smith Contact Person: John SMith
 Contact Phone: (903) 555-1234 Contact Email: jsmith@email.com
 Treatment Site Physical Address (attach map): 5302 FM 2495

Date Surveyed: 4/16/18 Proposed Treatment Start & End Dates: * 4/23/18 TO 9/30/18

Aquatic Vegetation Type(s) - Please Check ALL That Apply: Floating Emergent Submerged
 Concern Tier – Please Check ONE: Immediate Response (Tier I) Maintenance (Tier II) Watch Status (Tier III)

Estimated Vegetation Coverage (Acres OR Shoreline Distance) To Be Treated: .25 acres Average Water Depth: 5 ft.

Proposed Treatment Type(s) - Please check ALL that apply: Mechanical Biological Chemical

Herbicide Applicator Name: Robert Doe Applicator License Number: 1234567

Enter Each Target Aquatic Vegetation Species Name On A Separate Row In Table Below. ** Also Enter All Surfactants In Table.

Aquatic Vegetation Species <small>Enter one species per row.</small>	Chemical Treatment Brand Name(s) / Active Ingredient(s) <small>Enter one per row; use separate row for each surfactant.</small>	Method/ Form of Treatment <small>Chemical spray, granular chemical, mechanical/cutting, biological control, etc.</small>	Treatment Site Description <small>Shoreline, cove, river/creek, etc.</small>	Treatment Area <small>Enter as acres, acre-feet, or shoreline distance for river/creek; give unit of measure.</small>	Percent Coverage <small>Enter as percent of treatment area.***</small>	Chemical Treatment Rate <small>Rate per acre or acre-foot (or per gallon***); give unit of measure</small>	Total Treatment Used <small>Multiply rate X area***</small>
Am. Pondweed	N/A	mechanical/cut	shoreline	.25 scres	0 %	N/A	N/A
Am. Lotus	Round Up Custome	chemical spray	shoreline	.25 acres	0 %	4 pints/acre	1 pint
Coontail	Komeen Crystal	Chemical Granular	shoreline	.25 acres	0 %	60 lbs/acre	15 lbs
Fil. Algae	N/A	mechanical/rake	shoreline	.25 acres	0 %	N/A	N/A
					%		
					%		
					%		

Comments: Mechanical treatments to be completed by Steve X of Vegetation Management Co

*Approved proposals authorize treatments (up to the maximum acreage proposed) until December 31st of the year the proposal was approved, provided compliance with requirements for notices of intent to apply aquatic herbicide and all applicable local or other regulations/requirements.

**Use Additional Copies Of This Form If Needed.

***Chemical Treatment Of Individual Patches of Riparian Nuisance Vegetation Intermittently Distributed Along a River or Creek Enter "Spot Treatment."

Appendix C

How to Apply for Aquatic Vegetation Treatment

AMWA will only accept treatment proposals from March 1 to May 31 annually³.

