Hydrilla Management Plan
Lake Conroe
2005-2006

Introduction

Lake Conroe is a 21,000-acre main channel reservoir on the San Jacinto River. The lake was constructed in 1973 principally as a water supply reservoir for the City of Houston (approximately 40 miles south of the lake). The San Jacinto River Authority (SJRA) is responsible for operation and maintenance of the reservoir. The area surrounding the lake is highly developed, including several small public parks. Lake Conroe is heavily utilized by a variety of outdoor recreation enthusiasts including anglers, skiers, personal water craft enthusiasts, and swimmers.

Vegetation and Vegetation Management

For over 30 years, aquatic vegetation management on Lake Conroe has been a concern for TPWD and SJRA, as well as lakeside property owners. A wide variety of exotic plants has been found in the lake including water hyacinth *Eichhornia crassipes* (identified in the lake shortly after impoundment), giant salvinia *Salvinia molesta* (found in 2000), and waterlettuce *Pistia stratiodes* (discovered in 2004). However, probably the most problematic species found in the lake to date has been hydrilla *Hydrilla verticillata*.

Hydrilla was first identified in Lake Conroe in 1975 (Klussmann et al. 1988), only two years after impoundment. By the time it was identified in Lake Conroe hydrilla already occupied 470 acres in the lake (Figure 1). Subsequent surveys indicated hydrilla was spreading rapidly in the lake. By 1979, hydrilla had increased to over 4500 acres and was causing significant problems for boaters, skiers, and swimmers. As a result of efforts by the Lake Conroe Association and its supporters and despite objections by TPWD staff, the Texas Legislature directed the Texas Agricultural Experiment Station (Now Texas Cooperative Extension, TCE) and TPWD to conduct a study to determine the efficacy, and other effects of grass carp use in Lake Conroe. TCE then obtained a permit to use grass carp from TPWD (Klussmann et al. 1988). However, as a result of efforts by the angling community, a court-ordered temporary injunction delayed the stocking of grass carp.

In 1981, a revised legislative directive (House Bill 556) directed TAES (and not TPWD) to conduct the grass carp study. This action put an end to court proceedings, a new permit is issued to TAES, and grass carp stocking was cleared to proceed (Klussmann et al. 1988).

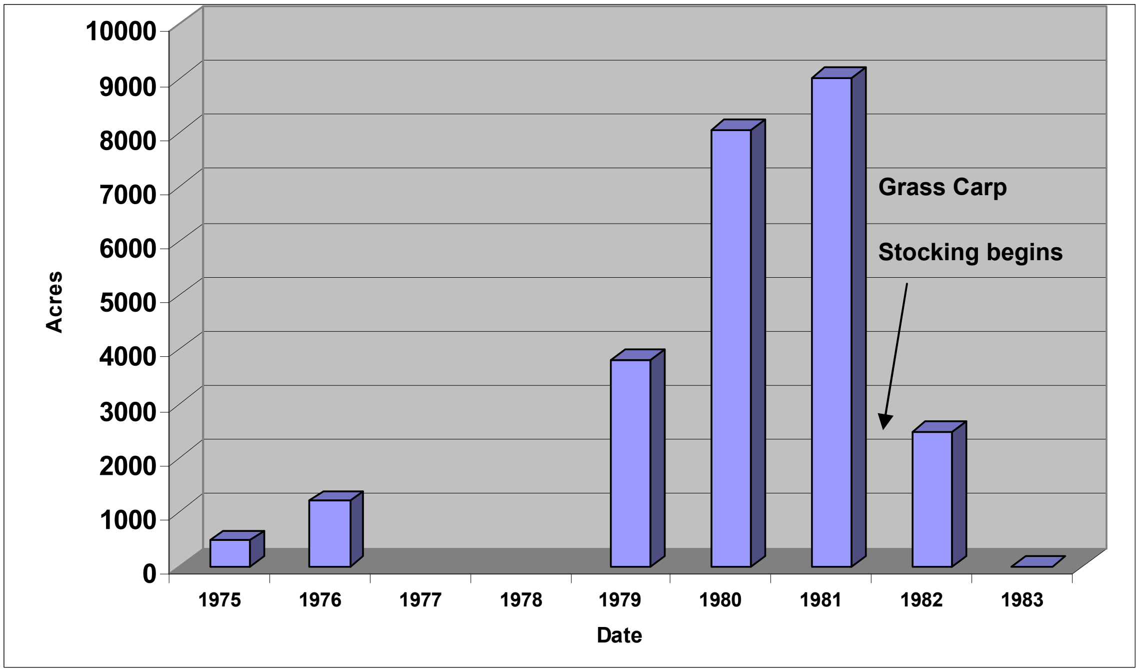

Figure 1. Hydrilla coverage in Lake Conroe 1975-1983. Data from TPWD vegetation Surveys.

Between September 1981 and September 1982, 270,000 non-sterile diploid grass carp were introduced into Lake Conroe to control aquatic vegetation. By October 1983 all vegetation had been removed from the lake. Hydrilla did not re-emerge in Lake Conroe for 13 years. In 1996, 3.2 acres of hydrilla were discovered. For nine more years, herbicide treatments funded primarily by SJRA and conducted by SJRA and TPWD were able to successfully inhibit the expansion of hydrilla (Figure 2.). However, by 2005 hydrilla expanded despite intensive herbicide treatments in late 2004 and early 2005.

As a result, TPWD and SJRA met and determined the need to develop a comprehensive hydrilla management plan for Lake Conroe, based on the principles of Integrated Pest Management (IPM). TPWD defines IPM as:

> *The coordinated use of pest and environmental information and pest control methods to prevent unacceptable levels of pest damage by the most economical means and in a manner that will cause the least possible hazard to persons, property, and the environment. Integrated pest management includes consideration of ecological, biological, chemical, and mechanical strategies for control of nuisance aquatic vegetation.*

The State Aquatic Vegetation Management Plan (under which the Lake Conroe plan would fall) is based on IPM. Information about the State Aquatic Vegetation Management Plan is found in *Aquatic Vegetation Management In Texas: A Guidance Document* at:

http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_pl_t3200_1066.pdf

The purpose of this document is to provide a plan for hydrilla control activities in Lake Conroe during 2005-2006.

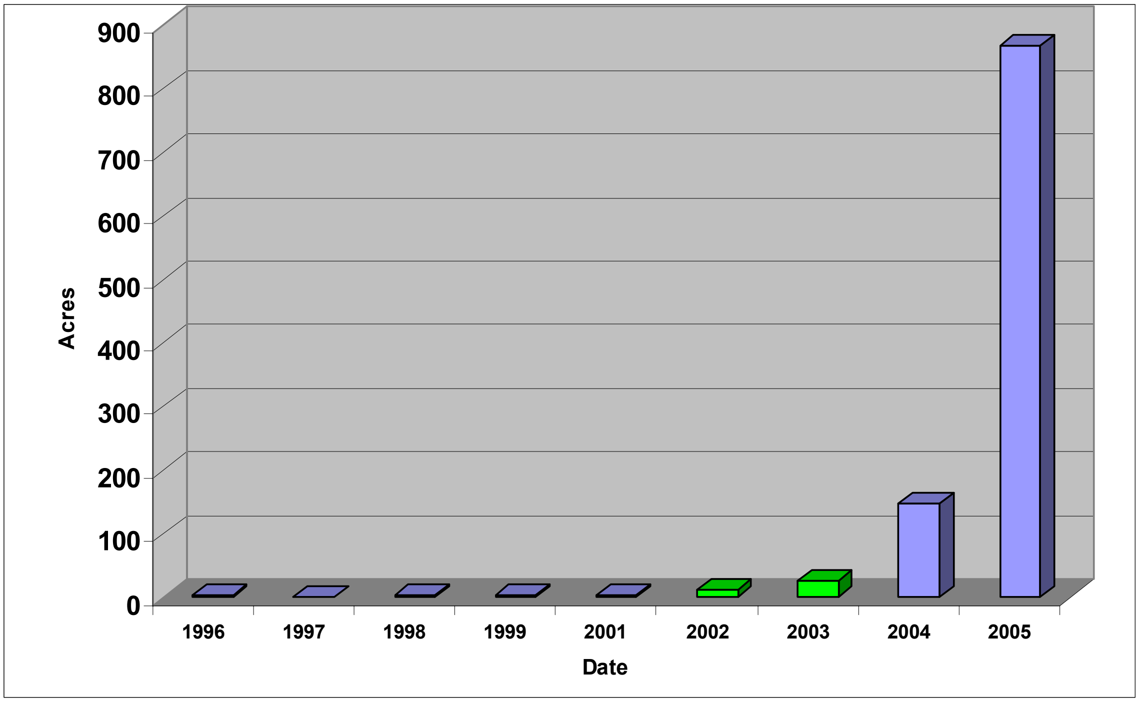

Figure 2. Hydrilla coverage in Lake Conroe 1996-2004. Data from TPWD vegetation Surveys are in blue, and data from SJRA are in green.

Objectives of this plan

- To reduce hydrilla infestations in Lake Conroe to 40 acres or less by March 2008, while minimizing damage to stands of native vegetation.
- To maintain a healthy lake ecosystem and fishery in Lake Conroe while providing access for recreational activities on the Lake.

Integrated Pest Management Options for Hydrilla

A. Mechanical/Physical Control

i. Mechanical harvesters (Traditional harvesters with vertical and horizontal cutting blades)

Pros:

- No chemicals introduced into the water, and no effect on drinking water.

- Plant biomass and nutrients can be removed from the system.
- No new organisms are introduced.
- High level of treatment precision; targeted plants can be removed within a well-defined area.

Cons:
- Very slow removal (typically 1-2 acres/day under ideal conditions).
- Fragmentation may accelerate spread of aquatic plant species.
- Small fish and other wildlife mortality may occur during the process of vegetation removal, but may not affect overall fish community health.
- Short-term control method, repeated cutting during the growing season typically required.
- Requires 2.0-3.0 feet of water (depending on harvester size) with no submerged obstacles (stumps, rocks, etc.).

Applicability: May be used in areas greater than 2.0 feet deep, where there are few submerged obstacles, and where fragmentation and re-growth will not significantly increase the plant's ability to spread.

ii. **Mechanical shredders** (Includes floating barge type machines that shred vegetation near the water surface rather than cutting and harvesting it.)

Pros:
- No chemicals introduced into the water and no restrictions on the use of water for drinking.
- No new organisms are introduced.
- 80% or more of the plants that are shredded usually die.
- Up to 32 times faster than traditional harvesters.
- Potentially much lower cost per acre than traditional harvesters.

Cons:
- Fragmentation may accelerate spread of aquatic plant species.
- Requires a minimum of 2.0-3.0 feet of water with no submerged obstacles (stumps, rocks, etc.).
- May require repeated use during the growing season.
- May temporarily depress dissolved oxygen levels.
- May be dangerous to fish and other wildlife associated with plants.

Applicability: Areas greater than 2.0 feet deep with few submerged obstacles, and where fragmentation will not significantly increase a plants ability to spread.

iii. **Water level manipulations -** The purpose of water level manipulation is to strand plants on the shoreline. Drawdowns are effective on most submerged plants such as Eurasian watermilfoil. However, water level manipulations seem to be somewhat less effective on hydrilla than on many other plants, because of its adaptability. For example, some drying seems to act as a trigger causing increased hydrilla tuber germination. As a result, specific circumstances have to be examined carefully before water level manipulation is used as a hydrilla control strategy. If hydrilla exists as a monospecific plant community, water level manipulations could be a viable means of controlling its growth, especially if two drawdowns are used as suggested in some literature; one to germinate tubers, and a second to kill germinated tubers.

Pros:
- Can provide substantial control if water levels can be adjusted.
- No chemicals introduced into the water and no restrictions on the use of water for drinking.
- Can provide selective control if water level manipulations are properly timed with the life history of target species.
- No new organisms are introduced.

Cons:
- May have significant detrimental impacts to ecosystem, particularly fisheries, if drawdowns are not appropriately timed.
- Drawdowns may be restricted by water rights and/or reservoir obligations.
- May impact various uses of the water body (e.g. boat access, sale of water, power plant cooling, etc.).
- Individual floating plants (species such as salvinia or waterhyacinth) may remain viable.

Applicability: Use of drawdowns is limited to water bodies with water control structures.

iv. **Bottom Barriers -** Physical barriers have been used with various degrees of success to prevent weed growth in specific applications. Usually these consist of various types of dark polyethylene plastic which are spread across the bottom of the area to be kept weed-free and then staked in place. Barriers are fairly expensive and labor-intensive to install. These systems are generally used only around boat docks, swimming areas, etc. due to their expense. Barriers are susceptible to damage by propellers, storm damage, and dredging. Problems have also been encountered in the past with gases (i.e. oxygen and CO_2) building up under the film and buoying the barrier up from the bottom; however more modern gas permeable fabrics are designed to avoid this.

Pros:

- No chemicals introduced into the water and no restrictions on the use of water for drinking.
- No new organisms are introduced.
- Growth of submerged plant species is inhibited.
- No fragmentation problems.
- No water use restrictions.

Cons:
- Not plant specific, all submerged plants are affected.
- Expensive and labor intensive.
- Not effective on floating species.
- Difficulties keeping the barrier submerged.
- Sediment may accumulate on top of the barrier.
- Plants may grow in sediment on top of the barrier.
- Limited to small areas.

Applicability: Primarily useful in small pond, and still water situations.

v. **Weed Rollers** – Microchip controlled cylinders roll in an arc (up to 270°) continually disturbing vegetation and inhibiting rooted aquatic plant growth

Pros:
- No chemicals introduced into the water and no restrictions on the use of water for drinking.
- No new organisms introduced.
- Can be used on any submerged plant species.
- Site specific.
- No water use restrictions.
- May be effective in 2 days to 2 weeks.

Cons:
- Limited to a radius of 7-21 feet.
- May disturb benthic (bottom dwelling) organisms.
- May cause fragmentation.

Applicability: Useful on small areas with no stumps or other underwater obstructions.

vi. **Removal by hand**

Pros:
- No chemicals introduced into the water and no restrictions on the use of water for drinking.
- No new organisms are introduced.

- Can be used on any plant species.
- Can be highly species and site specific.
- No water use restrictions.

Cons:
- Very labor intensive.
- May significantly alter substrate and disturb resident organisms.
- Very time consuming.
- Only effective on small infestations.
- Re-growth may occur in as little as 30 days unless roots and tubers are removed.
- Fragmentation can be a significant problem with submerged species.

Applicability: Primarily useful on new or small infestations.

B. Biological Control

i. **Triploid grass carp *Ctenopharyngodon idella***

Grass carp, or white amur, are plant-eating fish native to Asia. They are capable of surviving at temperatures ranging from below freezing to over 100ºF. Grass carp grow rapidly. In their native habitat they may typically grow 80-100 pounds. Fingerlings, juveniles and adults feed almost exclusively on plant material. Depending on temperature, water quality, and plant quality they may consume less than 10% of their body weight per day or up to three times their body weight per day. Typically, hydrilla is preferred over other food items. Triploid grass carp are sterile. In Texas, only triploid grass carp may be stocked, and only by TPWD permit. In general, recommended stocking rates are 5-10 fish per vegetated acre.

Pros:
- No chemicals introduced into the water and no restrictions on the use of water for drinking.
- Usually long-term control
- Plant biomass can be removed from the system.
- Triploid grass carp will not reproduce.
- Hydrilla is a preferred food type

Cons:
- If not confined, grass carp will typically leave target treatment area. In some cases they have been found over 200 miles from target treatment areas.
- Grass carp may consume non-target plant species when available.
- Grass carp may consume vegetation in non-target areas.
- It is difficult to achieve partial control.

- Grass carp are not readily susceptible to conventional capture techniques and are not easily removed from waterbodies if overstocked.
- Grass carp have been captured in brackish water up to 17 ppt (~50% sea water) and can even survive for short periods of time in hypersaline water. Escapees may be capable of feeding in some estuary situations.

Applicability: Waterbodies where confinement is possible and potential elimination of all aquatic vegetation is acceptable.

C. Chemical Control

Many herbicides are quick acting and show results within a matter of days. Others are systemic and kill plants over longer periods of time. The following table lists commonly used herbicides available today. Use of federally approved chemicals for the purposes of nuisance aquatic plant removal is acceptable under the plan within the limitations of the rules.

i. Chelated copper

Active ingredient: Copper chelates

Pros:
- Requires a short contact time on the order of hours with target plant species.
- Quick acting, results evident in a few days.
- No water use restrictions after application.
- No new organisms are introduced.

Cons:
- Low dissolved oxygen can be a problem if large areas are controlled at once.
- Surviving plants may re-establish population levels within 1-2 months.
- May have to be used more than once per growing season.
- Does not affect hydrilla tubers buried in the soil, which may remain dormant for 4-5 years or more before germinating.
- In flowing water special slow release herbicide delivery equipment is required.

Applicability: May be used in still water. May also be used on plants in flowing water, however, a special delivery system may be required in high flow situations.

ii. Diquat

Active ingredient: Diquat (6,7-dihyrodipyrido (1,2-α:2',1'-c) pyrazinediium bromide)

Pros:

- Requires short contact time with target plant (minutes).
- Quick acting, results evident in a few days (in some cases the same day).
- When sprayed on floating plants, very little enters the water column (although it can be injected into the water for use on submerged vegetation).
- No new organisms are introduced.
- No swimming or fishing restrictions when using diquat at labeled rates.
- Controls floating, marginal, and submerged weeds.

Cons:

- Low dissolved oxygen can be a problem if large areas are controlled at once.
- Treated water cannot be used for livestock, or as public water source for 0-5 days after application depending on application rate and how the water will be used.
- Surviving plants may re-establish population levels within weeks.
- May have to be used more than once per growing season to control surviving plants (depending on plant species).
- Does not affect hydrilla tubers buried in the soil that may remain dormant for 4-5 years or more before germinating.

Applicability: May be used on floating, marginal, or submerged plants in either still or flowing water.

iii. Endothall

Active ingredient: Dipotassium salt of endothall (7-oxabicyclo [2,2,1]heptane-2,3-dicarboxylic acid)

Pros:

- Requires very short contact time (~2 hrs) with target plant to be effective.
- Quick acting. Results may be seen in 7-10 days.
- Remains in the water column only a matter of minutes.
- No new organisms are introduced.

Cons:

- Low dissolved oxygen can be a problem if large areas are controlled at once.

- Treated water cannot be used for livestock or as a public water source for 7 days after application.
- Surviving plants may re-establish population levels within 30 days.
- May have to be used more than once per growing season.
- Does not affect hydrilla tubers buried in the soil that may remain dormant for 4-5 years or more before germinating.
- In flowing water, special slow release herbicide delivery equipment would be required.
- Problems with the interpretation of terms such as "treated water" and "treated area" on the specimen labels of several herbicides, including endothall compounds, must be worked out with TDA, and U.S. Environmental Protection Agency. A final interpretation of these terms may affect post treatment water uses.

Applicability: Can be used in moderate flow situations where immediate use of the water for drinking or livestock is unnecessary. As with fluridone, experimental drip delivery systems which expose target plants to low concentrations over extended periods of time have shown promise.

iv. Fluridone

Active ingredient: Fluridone (1-methyl-3-phenyl-5-[3-(trifluoromethyl)phenyl]-4(1H)-pyridinone)

Pros:
- Fluridone is a systemic herbicide and hydrilla populations are slow to recover after treatment. All parts of the plant are affected, with the exception of dormant tubers which have become separated from parent plants. In some reservoirs 2-4 years of control are achieved.
- Low dissolved oxygen typically not a problem because plants die slowly.
- May kill newly germinated hydrilla tubers.
- No new organisms are introduced.

Cons:
- Requires very long contact time. In some cases the treatment may be spread out over several weeks to provide the necessary contact time (under normal treatment conditions in still water).
- Takes up to 100 days for full results.
- Cannot be used within ¼ mile of a potable water intake at concentrations greater than 20 ppb.
- Treated water should not be used for irrigation for 7-30 days depending on the crop.
- Does not affect dormant hydrilla tubers buried in the soil and separated from parent plants. Tubers may remain dormant for 4-5 years or more before germinating.

Applicability: Fluridone is most applicable in water with little flow, and where the treatment area is greater than 10 acres in size. There is little applicability in flowing water such as main channels using conventional delivery systems. However, experimental drip delivery, which exposes target plants to low herbicide concentrations over an extended period of time, has shown promise. The use of pelleted formulations allows treatment in areas with some flow. Pellets are also often used on submerged plants. Liquid fluridone is usually used on floating vegetation such as salvinia.

A more detailed discussion of management options for hydrilla, as well as other species, is found in *Aquatic Vegetation Management In Texas: A Guidance Document.* [See website]

Proposed Actions/Timeline

August-September 2005

1) **Conduct a comprehensive vegetation survey.**

Rationale - The results of this survey will be used as a point of reference to compare with vegetation levels at the same time the following year, as well as vegetation levels during any subsequent 2005-2006 vegetation surveys in order to determine if hydrilla coverage is increasing or decreasing.

Responsible party(s) – TPWD, SJRA

September-November 2005

1) **Continue herbicide treatments to control hydrilla**

Rationale – Herbicide use has proven an effective means of hydrilla control in Lake Conroe over the past nine years. Continued herbicide use will help augment the effects of biological controls by reducing hydrilla biomass.

Responsible Party(s) – SJRA, TPWD,

2) **Apply for a permit to conduct a limited stocking of triploid grass carp.**

Rationale – It is apparent from recent survey results that herbicide treatments alone may not be able to suppress the hydrilla in Lake Conroe. Since grass carp prefer hydrilla, a limited introduction of grass carp now should give native plants an ecological advantage. Stocking grass carp soon based on the area of hydrilla currently in the lake should help avoid the necessity of stocking large numbers of the fish later that would threaten the viability of native vegetation stands.

Responsible Party(s) –SJRA, TPWD

3) Gather public input with respect to the introduction of triploid grass carp for hydrilla control in Lake Conroe.

Rationale – Lake Conroe is heavily utilized by anglers, boaters, and other visitors as well as lakeside property owners. Vegetation management activities, or a lack thereof, have the potential to significantly affect 1) access to outdoor activities such as swimming, boating, skiing, and angling, 2) property values in and around the lake, 3) local businesses, 4) the county tax base, 5) water quality, 6) the environmental health of the system, and 7) tourism.

Responsible Party(s) – TPWD, SJRA

4) Prepare to conduct a radio-tracking study to determine if grass carp that are temporarily caged after introduction will remain in target locations where they are stocked at a higher rate than un-caged fish.

Rationale – Typically grass carp undergo a period of increased movement for at least a few weeks after introduction. After this initial period of movement they often tend to settle down and remain relatively stationary for long periods of time. There is some evidence that the acclimation period of other fish species may be reduced by caging them for a short time after introduction. If the initial period of movement in grass carp could be eliminated they could be stocked more strategically in target areas, and fewer fish could be stocked to perform the same task. By reducing the number of grass carp that need to be stocked, the risk to native vegetation is also reduced.

Responsible Party(s) – TPWD, SJRA

December 2005-May 2006

1) If necessary, continue to gather public input with respect to the introduction of triploid grass carp for hydrilla control in Lake Conroe.

Rationale – Lake Conroe is heavily utilized by anglers, boaters, and other visitors as well as lakeside property owners. Vegetation management activities, or a lack thereof, have the potential to significantly affect: 1) access to outdoor activities such as swimming, boating, skiing, and angling, 2) property values in and around the lake, 3) local businesses, 4) the county tax base, 5) water quality, 6) the environmental health of the system, and 7) tourism.

Responsible Party(s) – TPWD, SJRA

2) If feasible, stock triploid grass carp in selected areas of Lake Conroe at a rate of 5 per infested acre of hydrilla in the lake.

Rationale - Since grass carp prefer hydrilla, a limited introduction should give native plants an ecological advantage by stressing hydrilla. Stocking grass carp soon based on the amount of hydrilla currently in the lake should help avoid the necessity of stocking large numbers of the fish later that would threaten the viability of native vegetation stands.

Responsible Party(s) – SJRA, TPWD,

3) If funds are available, implement an evaluation of radio-tagged triploid grass carp in Lake Conroe.

Rationale – Same as rationale for September through November preparation.

Responsible Party(s) –SJRA, TPWD

4) Monitor radio-tagged grass carp movement into and out of target areas.

Rationale – See Number 4 under September through November activities.

Responsible Party(s) – SJRA, TPWD

5) Where feasible hydrilla growing in less than 10 feet of water, and hydrilla growing within one foot of the surface, will be treated as quickly as possible, to a depth of at least five feet, using mechanical harvest and/or herbicide treatment.

Rationale – Same as above

Responsible Party(s) –SJRA, TPWD

6) Conduct a lake-wide vegetation survey in May.

Rationale - The results of this survey will be compared to previous surveys in order to determine if hydrilla coverage is increasing or decreasing, and to assess grass carp efficacy.

Responsible party(s) – TPWD, SJRA

7) Cooperators meet to evaluate vegetation survey results and determine if more triploid grass carp should be stocked.

Rationale – Survey results will be compared with results from the previous survey.

- **a.** If hydrilla coverage declines or remains the same additional grass carp will not be stocked at that time.
- **b.** If hydrilla coverage has expanded over previous survey results additional triploid grass carp will be stocked. Cooperators will evaluate the extent of the expansion, including density and aerial coverage in light of published literature and TPWD experience in Texas to determine the number of additional grass carp that will be stocked.

Responsible Party(s) –TPWD, SJRA

June-July 2006

1) Conduct a lake-wide vegetation survey in July.

Rationale - The results of this survey will be compared to previous surveys in order to determine if hydrilla coverage is increasing or decreasing, and to assess grass carp efficacy.

Responsible party(s) – TPWD, SJRA

2) Cooperators meet to evaluate vegetation survey results and determine if more triploid grass carp should be stocked.

Rationale – See Rationale under "December 2005 – May 2006", #7.

Responsible Party(s) –TPWD, SJRA

August 2006 **1) Cooperators meet to evaluate vegetation survey results and determine if more triploid grass carp should be stocked.**

Rationale – See Rationale under "December 2005 – May 2006", #7.

Responsible Party(s) –TPWD, SRA

September 2006 **1) Conduct a lake-wide vegetation survey in September.**

Rationale - The results of this survey will be compared to previous surveys in order to determine if hydrilla coverage is increasing or decreasing, and to assess grass carp efficacy.

Responsible party(s) – TPWD, SJRA

2) Cooperators meet to develop a 2006-2007 management plan.

Rationale – Depending on the results of vegetation survey data, management activities may have to be modified to increase efficacy.

Responsible Party(s) – TPWD, SJRA

Optional Activities **(Timeline to be determined if options are implemented)**

1) Stock hydrilla flies in selected areas of Lake Conroe and monitor hydrilla growth to evaluate the effectiveness of the flies.

Rationale – Hydrilla flies may provide an additional way to put pressure on the hydrilla population in Lake Conroe, and give native vegetation a competitive advantage.

Responsible Party(s) – TPWD, SJRA

Ongoing Efforts

Re-vegetation

Native species are good for erosion control, fish habitat, and water clarity. Additionally, established species help slow the spread of exotic plants such as hydrilla. TPWD, in cooperation with the U.S. Army Corps of Engineers and the San Jacinto River Authority is involved in an ongoing effort to establish and maintain a healthy native plant community in Lake Conroe. Native aquatic plant species listed in Table 1 have been introduced into Lake Conroe as part of a re-vegetation effort in the lake.

Table 1. Native aquatic plants introduced into Lake Conroe included 8 submersed, 4 floating-leaved and 13 emergent species.

Common name	Scientific name	Growth form
American pondweed	*Potamogeton nodosus*	Submersed
Illinois pondweed	*P. illinoensis*	Submersed
Sago pondweed	*P. pectinatus*	Submersed
Wild celery	*Vallisneria americana*	Submersed
Water stargrass	*Heteranthera dubia*	Submersed
Southern naiad	*Najas guadalupensis*	Submersed
Muskgrass	*Chara vulgaris*	Submersed
Coontail	*Ceratophyllum demersum*	Submersed
White water lily	*Nymphaea odorata*	Floating-leaved
Spatterdock	*Nuphar luteum*	Floating-leaved
Watershield	*Brasenia schreberi*	Floating-leaved
American lotus	*Nelumbo lutea*	Floating-leaved
Bulltongue	*Sagittaria graminea*	Emergent
Arrowhead	*S. latifolia*	Emergent
Tall burhead	*Echinodorus berteroi*	Emergent
Creeping burhead	*E. cordifolius*	Emergent
Pickerelweed	*Pontederia cordata*	Emergent
Water willow	*Justicia americana*	Emergent
Softstem bulrush	*Scirpus validus*	Emergent
Flatstem spikerush	*Eleocharis macrostachya*	Emergent
Squarestem spikerush	*E. quadrangulata*	Emergent
Slender spikerush	*E. acicularis*	Emergent
Water hyssop	*Bacopa monnieri*	Emergent
Maidencane	*Panicum hemitomon*	Emergent
Water pepper	*Polygonum hydropiperoides*	Emergent

Efforts to maintain a healthy plant community in Lake Conroe will continue, and re-vegetation activities will be increased in the event that introduced triploid grass carp reduce plant coverage in Lake Conroe to an unacceptably low level.

Fishery Assessments

The fish community in Lake Conroe is monitored regularly by TPWD personnel using a variety of survey methods. These efforts will continue. Table 2 summarizes these efforts.

Table 2. Fisheries surveys conducted on Lake Conroe.

Survey Type	Frequency	Target Species
Electrofishing	Annually	Largemouth bass, sunfish
Genetic evaluation	Annually	Largemouth bass
Gill netting	Every two years	Catfish, striped bass, white bass, hydrid striped bass
Trap netting	Every two years	White crappie, black crappie,
Creel Survey	Every four years	All species
Angler access	Every four years	-

Fisheries surveys will continue and the data will be used to determine fisheries health in the reservoir, as well as the possible effects of changes in habitat over time.

Literature Cited

Klussmann, W.G., Noble, R.L., Martyn, R.D., Clark, W.J., Betsill, R.K., Bettoli, P.W., Cichra, M.F., and Campbell, J.M. (1988) Control of aquatic macrophytes by grass carp in Lake Conroe, Texas, and the effects on the reservoir ecosystem. Texas Agricultural Experiment Station, Texas A&M University MP-1664. College Station, Texas. 61 pp.