



## Memorandum

- Fort Lauderdale Office** · 1800 Eller Drive · Suite 600 · Fort Lauderdale, FL 33316 · 954.921.7781(p) · 954.921.8807(f)  
 **West Palm Beach Office** · 560 Village Boulevard · Suite 340 · West Palm Beach, FL 33409 · 561.684.6161(p) · 561.684.6360(f)

Date: April 24, 2015

To: Mr. Jim Ward

From: Bruce Bernard

Subject: Miromar Lakes CDD Water Bodies

Project: Miromar Lakes Project No. 14-7438

Miromar Lakes Community Development District (CDD), per the South Florida Water Management District permit, is the custodian of water quality for the seven hundred acre lake system within the CDD. The SFWMD water samplings are obtained from the southern lake weir discharge outfall to insure that the Nitrate and Phosphorus parameters are in compliance with FDEP regulations.

The CDD, in coordination with Miromar Lakes Development, has begun a quarterly testing program of the lake(s) system to compile sampling data from throughout the lake system. This data, along with previous test results obtained from Lee County between 2004 and 2009, and NPDES test results from 1992 to 2013, will be used in an analysis to produce an overall picture of lake characteristics over time. As a result of this test program, any areas of concern will be identified quickly and will lead to timely corrective action.

The lake system has evolved to the state in which it currently exists, through a goal to decrease submerged weeds which were clogging boating channels and overtaking shallow water level areas. Grass carps were introduced into the lakes system in 2012, to control the submerged vegetation, and were the corrective action previously approved by the CDD. The Florida Fish and Wildlife Conservation Commission issued the permit to introduce seven thousand (7,000) grass carps into the seven hundred acre lake system. This was based on the FWC calculation of ten carp per Lake Acre. The grass carp have been an overwhelming success from the standpoint of the removal of submerged weeds. The negative impact of this management practice is the overabundance of grass carp which are now feeding on migration plantings on the littoral shelves within the lakes.

The high removal rate of grass and other plant material caused by the overabundance of grass carp has had a negative effect on lake turbidity, color, and clarity. The natural filtration of the lake water bodies provided by the plantings and submerged vegetation has been diminished thus reducing the water clarity and color. Also with the decrease in submerged vegetation, sediment is being disturbed on the lake bed by boating traffic. Additionally, the lake banks and water bodies need to be treated with chemicals to impede invasive plant growth. These chemicals also negatively impact the lake color.

The lake chemical properties have also drawn opinions and concerns as to the overall operation of the water bodies. Testing of the lakes has been undertaken by FGCU students, the Miromar Lakes Developer and Miromar Lakes CDD. The testing results have varied as well as methods of sampling in some cases.

The FGCU testing indicated that dissolved oxygen was in good supply and oxidation reduction potential was mostly positive, which is good. The total alkalinity level is high and thus results in a high PH reading, which is



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typical for an old mine pit. The testing also showed limited nitrogen, because of excessive amounts of phosphorus found in the lake from these samples. The overall opinion of Dr. Serge Thomas of FGCU, from his e-mail dated January 14, 2105, is that the lake is well eutrophic and possible hypereutrophic, and if steps were not taken the lake might go down a similar path as Lake Trafford. Dr. Thomas's opinion is that the lake system has not been impacted to the point where there is no possibility to return to normal, because the profiles are quite good.

The Miromar CDD test results indicated a different condition of the lake system and the lake system imminent demise may have been exaggerated. Mr. Bill Kurth, the Director of Operations for Lake Masters, stated in e-mails dated January 29<sup>th</sup> and February 9, 2015, that the results of phosphorus levels within the lake system, has the lakes condition as mesotrophic not eutrophic, much less hypereutrophic. The phosphorous readings were .023 ppm which is four times below the 0.1 ppm level, where concerns arise for lakes. The nitrogen level was higher than previously reported, but still within the normal range. Mr. Kurth examined the historical data, and it indicates that total phosphorus levels have consistently declined each year since the community started, even though a spike in the levels occurred in 2013. This was due to the release of nutrient by dying submerged weeds. Except for the slight and temporary spike in levels, the lake system has actually been improving over the development's history. Continued testing by all parties will further provide additional data to monitor any fluctuations in the lake system characteristics.

The one major concern is the continued activity of the grass carp. It is now apparent that the lake areas have an abundance of grass carp, which are decimating mitigation plantings within the littoral shelf and preventing grass to grow on the lake bed. The following are observations of the littoral plant material from Lake Masters: construction has altered some of the planting areas, the area along existing Lake 5 consists of mostly Rip Rap shoreline, and all of the non-attached lakes still have their plants, except for the portion of Lake 6 that is attached to the big lake.

The area at the end of Novelli Ct. is almost devoid of its plantings, as are areas in the small canals that are part of Lake 5 and small fingers of Lake 6. Lake Masters dug up some rhizome and root mass and believe that some of it is viable littoral plant materials, with new leaves emerging in some cases. It is their opinion that when the temperature warms and the rain begins, the plant material out of the water will throw new leaves. It is Lake Masters estimate that 50 % of the plant material still exists. It is our opinion that few will recover, but that some replacement plantings will be needed to comply with the County specifications. Littoral shelf barriers will need to be constructed to protect any existing plants, plus the new planting from the grass carp. These barriers will need to be installed in areas where the water is a few feet over the shelf.

The first stage of barrier installation has an estimated cost of \$8,000. Replanting of the littoral shelf for the coming fiscal year is estimated at \$15,000. Proposed for the next two years, are additional planting and barrier's to meet mitigation requirement benchmarks for Miromar Lakes CDD.

The reduction of the grass carp population will be needed to allow for the regrowth of the littoral shelf planting and grass beds. Miromar Lakes CDD has requested that the FWC grant a removal permit for the grass carp with a recommendation for amount of carp to removed. Once the permit has been issued, it will be up to the permit



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holder, Miromar Lakes CDD to approve a removal technique and disposal policy for the grass carp within the lake system. Some options have been provided that may be considered for this task:

1. Spear fishing- FGCU has a spear fishing club that can be utilized to help remove grass carp. This will be as an additional resource for removal, because of the small yield expected from this process.
2. Netting- there is many different styles of hoop or sweeper nets to use to remove grass carp. There is also commercial netting that can be used for this purpose. Removal will be dependent on the amount of fish net traps set and time allocation for removal of the carp.
3. Fishing Tournament- if applicable, engage a local fishing club and run a grass carp fishing tournament within the lake system for two days with prize money for amount of carp removed and total pounds of carp removed. You can also have Miromar Lakes residents, who fish the lake included in their own tournament at the same time and award same prize package for their fraction of the tournament.
4. Electric Stunning- the generating of electric current into an area of the lake to shock the grass carp. The carp will then float to the water's surface for removal by netting, while in this temporary state.
5. Water Current -using a motor and pump to create a current within the lake that the grass carp would hopefully follow. This current would lead to a designated canal where a netting or barrier would be installed to trap the carp in this area. Once this is accomplished, the carp would then need to be removed by additional netting.

An estimated amount of \$30,000 to \$45,000 dollars is anticipated for this removal process and is dependent on time resistant's for the method selected. This does not include any unforeseen costs for the disposal of the grass carp, once they are removed from the lake.

At the meeting held on April 2<sup>nd</sup> at the Miromar Lakes Clubhouse between interested parties dealing with the water bodies adjacent to this community, the topics outlined above were all discussed at length. In attendance were Serge Thomas, Win Everham and Toshi Urakawa of FGCU, Mike Elgin of Miramar Development, Bill Kurth of Lake Masters, Charlie Krebs of Hole Montes, Paul Cusmano and Bruce Bernard of CGA.

The initial discussion dealt with the grass carp removal, methods of removal, permit for grass carp removal, grass carp disposal, and location to perform this removal. The consensus of those in attendance supported removal through a spear fishing type approach by way of commercial fisherman in a selected location along with the FGCU spear fishing club participation. The other removal options were weighed but were not chosen based on the time frame required for removal, method of extermination, and lake community disruption. The disposal methods are being explored by CDD Asset Staff along with approved disposal sites. It was relayed to the group that the CDD had already begun the process of applying to the FWC for a grass carp take permit and have requested the amount of grass carp allowed to be removed from the lake system by the FWC.

FGCU (Toshi Urakawa) mentioned that a controlled area should be established in a couple of lake locations to analyze which mitigation plantings still exist, if the plants will regenerate, and what type of replacement plants should be installed. Bill Kurth of Lake Masters, mentioned that any planting should be done with material undesirable to the grass carp. Different plant and grass varieties were discussed and will be proposed for littoral shelf replanting when it occurs. Once the controlled areas have had a few months to simulate growth, there will be



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additional data generated to move forward with the next process in the work scope. The controlled areas will be provided with barriers so that the grass carp cannot encroach, once the water level rises.

The first area that will be labeled as a control location will be situated along the south side of Lake 5, east of the existing outfall. It will extend within the littoral shelf to the edge of Lake 6 along the east side of the channel. The barrier installed will consist of vinyl coated chicken wire and PVC stakes. This process will extend approximately two feet underwater at the average lake elevation along this controlled area. There will be no interruption of boating traffic during this procedure based on the location and the depth that the barrier will be installed at. Warning fencing will be utilized to identify the enclosed area to inform lake boat traffic of its existence. This will provide a large narrow confined area in which the FGCU staff will be able to monitor plant growth without grass carp interference. Mike Elgin, Miromar Lakes Developer, made a point to caution all that we can only operate within the area of Lake 5 that is maintained by Miromar Lakes CDD, and not outside those limits.

All of the options mentioned will require time, planning and coordination with the Miromar Lakes Community and Miromar Lakes Developer, FGCU, and the Miromar Lakes CDD to achieve desired results. The overall opinion of those at the April 2<sup>nd</sup> meeting was that a quarterly meeting to analyze data and review lake progress would be in order, and that the CDD website is to be utilized to post quarterly reports on the lake system analysis and progress.

Please find attached FWC take permit, different methods of grass carp removal, Lake Map showing location for carp removal.



April 14, 2015

To Whom It May Concern:

**Florida Fish and Wildlife Conservation Commission**

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**Eustis Fisheries Lab**

601 W Woodward Ave  
Eustis FL 32726  
(352) 357-2951  
(352) 357-2941 fax

*resources for their long-term well-being and the benefit of people.*

**Invasive Plant Management**  
Grass Carp Permitting

Rhonda Howell  
Regulatory Specialist III

601 W Woodward Ave  
Eustis, FL 32726

Phone: 352-357-2951  
Fax: 352-357-2941  
Rhonda.howell@myfwc.com

MyFWC.com

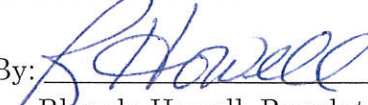
This special letter permit is to authorize Bruce Bernard of Calvin-Giordano & Associates to take triploid grass carp from Miromar Lakes Lake Maggiore / Lake Como located in Lee County, according to the special provisions listed below:

1. Grass carp may be captured using legal fishing methods for nongame fish, including hook and line, rod and reel, bow and arrow, cross bow, gig, and cast net, provided that the permittee is in possession of a valid Florida Freshwater Fishing License and in compliance with rules and regulations of the Commission.
2. Grass carp may be captured by electro fishing, provided that the operators of the equipment are in possession of a valid scientific collector's permit issued by the Commission.
3. Grass Carp caught under the provisions of this permit may not be kept alive, transported alive, or stocked in another body of water. All grass carp taken must be immediately destroyed.
4. All grass carp caught and removed must be reported on a monthly basis by mail, telephone or email to:

Rhonda Howell, Regulatory Specialist III  
Florida Fish and Wildlife Conservation Commission  
601 W Woodward Ave  
Eustis, FL 32726  
Phone: (352) 357-2951  
Email: [rhonda.howell@myfwc.com](mailto:rhonda.howell@myfwc.com)

5. This permit will expire April 13, 2016, unless otherwise authorized by the Executive Director.

Nick Wiley  
Executive Director

By: 

Rhonda Howell, Regulatory Specialist III  
Grass Carp Permitting  
Invasive Plant Management  
Division of Habitat & Species Conservation

- cc: Rob Kipker, Biological Administrator III  
Thomas Graef, Regional Director  
Bill Pouder, Regional Fisheries Administrator  
Major Dennis Post, Regional Commander

# Plant Management in Florida Waters : An Integrated Approach

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Home Control Methods Biological Control **Chinese Grass Carp**

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## Chinese Grass Carp

### *Ctenopharyngodon idella*

Chinese grass carp are herbivorous fish that have been purposely introduced into many Florida lakes and ponds to control aquatic weed growth. For many, grass carp seem like a good solution for aquatic weeds: the fish are relatively inexpensive and they consume problem plants, especially hydrilla. However, there are many factors to take into account when considering grass carp as a biological control method for invasive aquatic plants. While they are an effective and affordable solution for many lakes, grass carp are not a panacea. Under certain circumstances, they can create their own set of problems.

## Physical Characteristics

Most people are surprised to learn that grass carp are members of the minnow family. Grass carp grow to an average of 15-20 pounds and 20-35 inches in length. In larger lakes with large numbers of plants, they can grow up to 50-60 pounds and exceed 50 inches in length. In Florida, the largest reported grass carp weighed 75 pounds.

Also known as white amur, Chinese grass carp sometimes appear silver in color, but often display an olive green or dark gray hue on top with light gold or pale yellow sides. Their belly is silvery or bluish-white and fins are light green or gray. Unusually large fish scales are another distinguishing characteristic.



Chinese Grass Carp

## Grass Carp Sterility

Normally, grass carp require free-flowing river systems to spawn and produce eggs, so it is believed they don't pose a major threat to lake systems. However, grass carp have been known to escape from stocked lakes or ponds into



neighboring waterbodies; this may explain the presence of numerous breeding populations in a number of states along the Mississippi River. In Florida, three adult fish, including one gravid female, have been captured in the Suwannee River.

When grass carp are able to produce viable eggs, they are said to be "diploid" – they have the right number of chromosomes to reproduce. Florida law dictates that grass carp used for weed control must be sterile, or "triploid."

"Triploid" Chinese grass carp are hatchery-raised fish that have been sterilized by "shocking" fertilized eggs with drastic changes in temperature or hydrostatic pressure. The result is an extra chromosome in the egg, leaving the fish unable to produce viable eggs. This technique is used to eliminate reproduction in Florida waters.

Sterilization techniques are not 100% effective. One study showed that milt from some triploid males was used to successfully fertilize eggs from normal diploid females. Other studies have shown that triploid grass carp are able to produce viable eggs and sperm, although in very low numbers.

Because of these anomalies, some scientists suggest that every single fish be genetically tested by blood or tissue analysis before stocking them into a lake. A number of states in the U.S. have taken a more drastic approach and have banned grass carp altogether — both diploid and triploid.

#### **New Protocol Verifies Sterility of Newly Hatched Fish**

**Standards for U.S. Fish & Wildlife Service /Grass Carp Inspection and Certification Program**

## Grass Carp in Florida

Chinese grass carp were originally imported and stocked into Florida lakes in 1972 as part of an experimental effort to control hydrilla. When stocked in high enough numbers, the fish proved to be extremely effective.

However, when attempts were made to remove the fish, managers and biologists discovered the carp's uncanny ability to outsmart virtually every type of fishing technique. Nets, hooks-and-lines, electro-shocking, and poison baits were minimally successful, especially after the first attempts. It soon became apparent that once released, grass carp were nearly impossible to remove. As of 2010 there are still no easy ways to remove grass carp from a stocked lake.

### Plants Preferred by the Grass Carp

**hydrilla**

*Hydrilla verticillata*

**coontail**

*Ceratophyllum demersum*

**muskgrass**

*Chara* spp.

### Plants Not Preferred by the Grass Carp

**water hyacinth**

*Eichhornia crassipes*

**water lettuce**

*Pistia stratiotes*

**water lilies**

*Nymphaea odorata*, *N. mexicana*

**naiad***Najas* spp.**slender spikerush***Eleocharis baldwinii***jointed spikerush***Eleocharis equisetoides***torpedo grass***Panicum repens***hygrophila***Hygrophila polysperma***cattail***Typha* spp.

## Permit Required

In Florida, only [triploid grass carp](#) are allowed and a permit is always required, even when stocking privately owned waters. Permits may be obtained by contacting the **Florida Fish and Wildlife Conservation Commission (FWC)**.

## Grass Carp Considerations

Aside from being hard to catch, grass carp have other characteristics to be considered:

- Chinese grass carp are not selective about the plants they eat. Once their preferred plants are consumed, they can eat every plant in a waterbody, including [submersed](#), [emersed](#), and floating plants. They've even been observed wriggling out of the water to eat grasses along the shoreline.
- At low stocking rates (two to five fish per acre), it can take from six to twelve months before plants noticeably decrease in abundance. And because grass carp generally consume plants starting with the roots instead of the leaves and flowers, their effectiveness is sometimes underestimated. When this happens, people have been known to stock more fish into the lake. In some instances, this has resulted in "over-stocking" and the unintended consumption of all plants, leaving the lake devoid of vegetation.
- If grass carp are stocked in high enough numbers, there is the potential for a lake to change from a clear-water, plant-dominated system to a murky, algae-dominated system. This happens when macrophytes (larger plants) are consumed by grass carp, and **algae** (phytoplankton) expand to become the dominant plants within the system. Within weeks or months, the [water clarity](#) (link to [water clarity](#)) can be significantly reduced as algae increase in number and are suspended in the water. This gives the water an opaque green color and can appear as a scum on the surface of the water. Aquatic plants also serve as stabilizers for bottom sediments. Once they are removed, there is increased potential for sediments to become disturbed and re-suspended in the water, further decreasing clarity. This dynamic is sometimes overlooked and, as a result, there have been disappointed lakefront homeowners over the years.
- Grass carp can live for 10 years or more. The older they are, the larger they become and the more food they will consume. If high numbers of fish are stocked, this can translate into the loss of a tremendous amount of plant [biomass](#) within a lake. For more information, view the following paper: **The Water Quality and Fishery of Lake Baldwin, Florida: 4 Years after Macrophyte Removal by Grass Carp.**

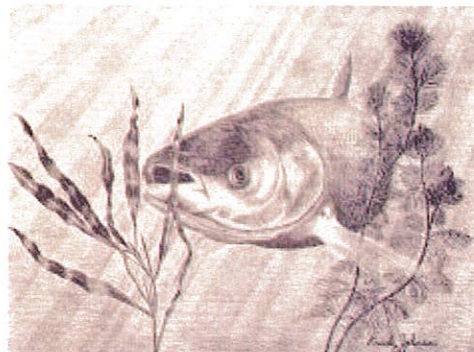
## Stocking Rates

Ever since Chinese grass carp were introduced to Florida waters, efforts have been made to develop a formula to accurately predict the appropriate number of grass carp for stocking purposes, based on lake size and plant coverage.

The ideal goal is to stock just enough fish so that aquatic weed consumption slightly exceeds aquatic weed growth.



According to the Florida Fish and Wildlife Conservation Commission (FWC), this can be achieved with approximately two to five fish per acre of submersed vegetation. However, according to another group of lake experts, this formula has produced mixed results. In fact, when using **Florida LAKEWATCH data**, one study shows a breaking point for the use of grass carp in aquatic plant control.\* When stocked in high numbers (greater than 10-12 fish per acre of aquatic vegetation), grass carp were efficient at eating virtually every submersed plant in a lake. In some instances, they ignored a few less palatable plant species (water lilies, bacopa and water hyacinths), but the rest of the plants were effectively controlled. When stocked in lower numbers (less than 10-12 carp per acre of vegetation), the growth rate of the plants was often greater than the consumption rates of the fish and very little plant control was achieved.



Chinese Grass Carp - Randy Johnson (DNR, 1980)

According to Florida **LAKEWATCH's** Mark Hoyer, this "all or nothing" situation isn't always a bad thing. If the goal is to completely control the growth of nuisance plants in a lake, grass carp provide an economical long-term solution without the use of herbicides. Also, grass carp are particularly useful in small urban lakes, where submersed vegetation is not as imperative for fish habitat.

\* Sandra G. Hanlon, et. al. 2000. *Evaluation of macrophyte control in 38 Florida lakes using triploid grass carp*. *Journal of Aquatic Plant Management*.38: 48-54.

## How to Remove Grass Carp

When faced with hundreds of unwanted grass carp in Lake McMeekin in 1990, one individual tried to remove them using hook and line. He began by tossing soybean chum into the water from his dock. He then used molded dough balls made from uncooked biscuit mix. Using this technique, the angler and his neighbors reportedly caught more than 600 grass carp..

Other baits recommended include traditional bread balls, dog food, corn, celery, or live worms.

## Training Grass Carp

Some researchers investigated training grass carp to respond to underwater sound frequencies in order to herd them into smaller areas, capture and remove them once they were no longer needed. Two studies conducted at the University of Florida, IFAS Department of Fisheries and Aquatic Sciences suggest there was hope for removing grass carp from small lakes or ponds using this method. However, to date, nothing has proved successful.



# How to Get Rid of Grass Carp

## Overview

Grass carp are a Chinese minnow that can easily grow to 50 to 75 pounds in a large lake; some have been known to grow even larger. Grass carp were introduced to American lakes in the 1970s as a way to control unwanted vegetation. The grass carp eats its own weight in lake or pond vegetation every day, and as long as it is kept in still water, it cannot reproduce. There are two problems with grass carp. First, given enough time they will strip a lake or pond bare of all vegetation, which is unhealthy for most lakes or ponds. The second problem is that they are exceedingly smart and difficult to catch or trap.

### Step 1

Chum a section of a pond or lake with corn. Use canned corn or use feed corn that has been soaked in water for three days. If possible, choose an inlet in the lake or pond that will restrict the movements of the fish.


### Step 2

Bait a small hook with a ball of bread dough and cast from a hidden location into the chummed area. Grass carp are easily spooked if they see movement on the shore, so stay well hidden. Be patient. Grass carp are difficult to catch with a hook and line.

### Step 3

Toss a fishing net over the chummed area. Throwing a fishing net requires practice and skill. Hire someone to throw the net for you if you lack the necessary skill. Again, keep hidden as much as possible on the shore before throwing the net.

### Step 4

Drag a dragnet through the water if it is feasible, depending on  the size and shape of the lake. Grass carp are difficult to catch in a dragnet unless they are concentrated in a small area from which it is already difficult to escape.

### Step 5

Shoot the fish with arrows. Bow hunting has proven to be an effective method of eradicating grass carp. If you are not proficient with a bow and arrow, then contact a local bow hunting club; members will welcome the challenge.

## Things You'll Need

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- Corn
- Fishing pole with small hook
- Raw bread dough
- Fishing net
- Drag net
- Bow and arrow



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Anglers to Target Grass Carp on Lake Conroe

Bow and rod-and-reel anglers will remove excess carp to aid native aquatic vegetation restoration

ATHENS—Texas Parks and Wildlife Department (TPWD) Inland Fisheries staff has partnered with the Texas Bowfishing Association (TBA) and the Texas BASS Federation Nation (TBFN) to conduct a grass carp removal tournament on Lake Conroe Saturday and Sunday July 9 and 10.

The TBFN will be hosting a rod-and-reel grass carp tournament from 7:00 a.m. to 3:00 p.m. Saturday, July 9, and be headquartered at Stow-A-Way Marina. They will be fishing from boats and limited shoreline areas lake-wide during tournament hours.

The TBA bowfishers will be fishing from 8:00 p.m. Saturday, July 9, until 8:00 a.m. Sunday, July 10. They will be launching and weighing in at Scott's Ridge boat ramp. The bowfishers will be restricted to fishing only above (north of) the F.M. 1097 bridge. For bowfishers, several no-fishing zones will be in place adjacent to developed shoreline, and an idle-only area will be in place adjacent to Cagle Campground to reduce noise for overnight campers.

TPWD Inland Fisheries staff will be on site at both weigh-ins and during the event to count grass carp harvested. Both tournament organizers have been provided a temporary exemption to the prohibition against grass carp possession. This event has also been coordinated with San Jacinto River Authority (SJRA) and the U.S. Forest Service rangers.

Triploid grass carp were introduced to Lake Conroe as part of an integrated pest management approach to control the invasive exotic aquatic plant hydrilla. Hydrilla has been successfully controlled. Now, many fewer grass carp are needed to keep re-sprouting hydrilla at bay. Over-abundant grass carp have damaged important native vegetation and become a hindrance to fish habitat improvement efforts.

"This event is an attempt to reduce the total number of grass carp in Lake Conroe to a number capable of preventing re-sprouting of hydrilla but which will allow us and our partners to better enhance important native aquatic vegetation for fish habitat and water quality improvement," said Craig Bonds, TPWD's Inland Fisheries regional director for East Texas.

"We have come to realize that grass carp are an integral tool in hydrilla management, yet too many grass carp can be detrimental to future recruitment of desirable fish species such as largemouth bass," said Ron Gunter, assistant state

conservation director for TBFN. "Native plants provide habitat and cover for newly hatched fish fry, and grass carp are programmed to consume aquatic plants."

TPWD fisheries biologists estimate approximately 32,600 grass carp remained in Lake Conroe as of May 31, 2011. This estimate is based on applying a scientifically-accepted annual mortality rate of 32 percent to total numbers stocked.

"The goal of this carp tournament is to help TPWD better determine the 'magic number' of grass carp needed on Lake Conroe to keep hydrilla at bay while allowing native aquatic plants to flourish," Gunter said. "This tournament will be a challenge, as grass carp are not targeted on a regular basis, yet the event will be a shining example of how concerned anglers can work together with TPWD to bring environmental balance to a reservoir such as Lake Conroe."

"The Texas Bowfishing Association is proud to be a partner in this joint effort to remove excess grass carp from Lake Conroe. Bowfishermen have been an effective tool in removing fish of undesirable species from Texas waters for many years and are happy to assist in this effort also," said Walter Blackburn, president of TBA.

Fish habitat enhancement projects in Lake Conroe have been financially supported by grants from the Reservoir Fisheries Habitat Partnership, the National Fish and Wildlife Foundation and the Toyota Texas Bass Classic.

Additional tournament information, including tournament registration, for rod-and-reel and bowfishing tournaments can be found at the following sites:

<http://www.sevencovesbassclub.com>

<http://www.texasbowfishingasso...t.pdf>



**BassAm**  
Sktr22's  
Whipping Boy



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1997 posts  
[100%]  
Spring TX

**Re: Anglers to Target Grass Carp on Lake Conroe (John Payette) »**

8:45 AM 7/8/2011 [Reply](#) [Edit](#)

TTT, this happens tomorrow. Also the State B.A.S.S. Federation will be there to show off their new live release trailer. Fortunately no carp will be going in it.



**John Payette**  
Welcome To The  
Jungle!



Offline

**Re: Anglers to Target Grass Carp on Lake Conroe (BassAm) »**

8:59 AM 7/8/2011 [Reply](#) [Edit](#)

Kill them all     





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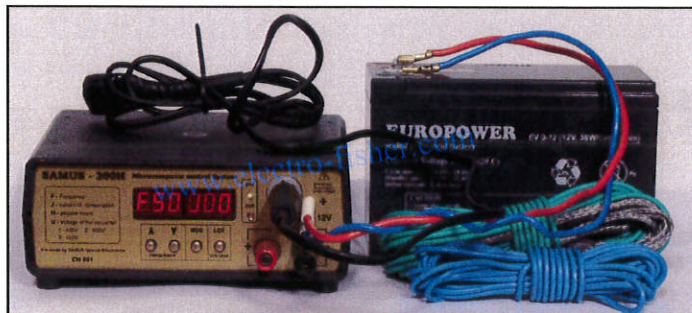
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Fish shocker / fish stunner built on MOSFET transistors.

Voltage of inverter 400-500 Volt - Impulse amplitude 800 and 1000V

500 watts of output power ( in order to achieve high-reliability )

Electric fish shocker (fish stunner) has a built-in microcomputer, which allows to regulate frequency and voltage of impulses by the means of keyboard and also indicates on digital display:

Frequency and voltage of going out electric impulses ( frequency and voltage of output impulses are stable, does not depend on power supply or loading)

Exit power in watts - J (current) X 10 = POWER

Consumed current in the amperes

Quantity of used ampere-hours from battery

Time of electrofishing

General field work of electric fishing tool in hours and ampere-hours (data saved when power supply is off)- this function is disabled in this model.

Indicator of battery unloading - yellow diode on the panel.  
Blackout of display panel in case of night fishing (optional)

Device is switched by inserting a password which protects from unauthorised use ( there is another password which after inserting the electrofisher does not give high voltage- only display panel is on- this function is necessary for some countries where electrofishing is forbidden)

Overload and polarity protection.

Industrial internal outlook

Dimensions (box of 167X155X58 )

Weight < 1,1 kg ( without battery)

Power supply from battery from a UPS or from a car battery (7-10 AH battery sufficient on 1-4 hours of electrofishing).

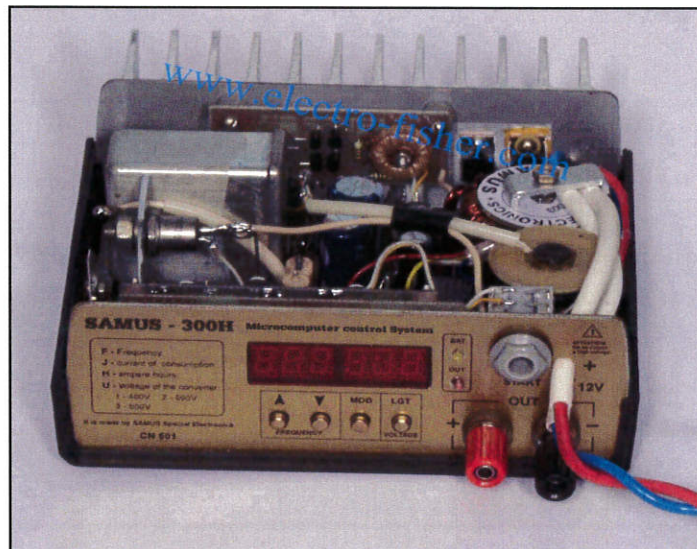
Warranty- 1 year.

The fish shocker catches various fish very well.

**Main technical features of electric fishing machine SAMUS300:**

Input Voltage	12 VDC Nominal Range ( 10-14 VDC)
Input Current	5-50 Amps ( operating 10-20 Amps)
Output Voltage	1000 V max ( 400 and 500 V- inverter and doubled in impulse from 800 to 1000 V max)
Output Power	500 watts maximum (in peak) ( operating 40-200 watts)
Output Frequency	(5-100) Hz in 1 Hz steps
Weight:	< 1,1 kg ( battery 7 Ah 2,5 kg)
Dimensions:	167x155x58 millimetres
Battery	12 V DC ( any model)
Battery life	7 Ah (1-4 hours of electrofishing) Larger battery-longer fishing.
Overload protection	Yes ("-----" appears on display panel while working)
Polarity protection	YES ( "+" and " - " change will not cause damage of fish shocker)
Battery alarm	Yellow diode appears on display panel in the middle when it reaches 10,3 V

**Internal outlook photo of electric fishing machine / fish stunner below :**







Choose language



+48-790-797-940

English Russian Polish

0 789 159-38-70

The UK ONLY

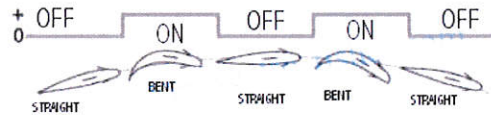
electrofishers@gmail.com

[Home](#)[What is the electrofisher?](#)[How to electrofish?](#)[Electrofisher SAMUS725G](#)[Fish shocker SAMUS300](#)[Instructions](#)[Movie and photos](#)[Contact](#)[Links](#)[Electrofisher manual for SAMUS725G](#)[Download a movie -Electrofishing from a boat - 9 MB](#)[Download a movie - Backpack electrofishing - 9 MB](#)

## What is the electrofisher?

The electrofisher is such an electronic device by the means of which a man may - at certain practice - catch fishes in large quantities and very quickly. Idea of the electrofisher is based on a fact that at the flow of electric direct current in water appears at fishes so-called anode reaction (galvanotaxis) under influence of which fish begins to flow from negative electrodes to positive electrodes. Most interesting is fact, that the greater the fish the more with pleasure she goes out from water in direction of the landing net.

Drawing below presents behaviour of the fish under influence of electric current.



Anode reaction of the fish (pulling in direction of anode) is explained by this, that fish catches definite direction of movement of ions and directs oneself with head on their stream. Under influence of electric field brawn of fishes shrink and it raises automatically. Truth is, that to anodes it can not reach if around anode voltage is higher from critical. In such case fish falls in state of nervous shock and sails out or drops on the bottom. To prevent it the voltage enlarges or diminishes with distance between cathode and anode. This, however, represents certain technical difficulties. Enlargement of space between electrodes with attempt of keeping optimum electric field causes enlargement of dangerous zone for fish. Apart from that parameters of applied electric field in considerable degree depend on conductivity of waters (saltiness), temperatures, from surface of electrodes, source of power supply. There are lots sorts of fishes, they differ between themselves by size. After researches it was found that it takes place only in case of direct current or impulse current. Most effective appears direct current, however, it is partially limited to use only to freshwaters of low-conductivity waters. In most salty waters it would demand usage of large power in power supply of such devices. As a result most of cases it is used impulse current. Impulse current is more efficient at smaller energy necessary to power supply the electrofisher.

Basic part of electrofishing is catching fish for reproduction, nevertheless, one can use it equally well to fish in consumer aims. Equipped in such a device a fisherman may press the button of steering, to dip electrodes and to "pick up" hypnotised fishes. In moment of hunting swim up fishes of different sizes, little ones after shaking down oneself from nervous shock sail away in several seconds hiding at random, larger ones are chosen by fisherman.

During the flow of electric current in water with sufficient power fish raises from minus to plus. This reaction is called anode reaction. All art in this so that electric current was direct current. However to receive power of direct current necessary to embrace sufficient zones of water no battery would not be sufficiently large. Because of that we use impulse current. One should know, that for every fishes it is necessary to choose own parameters of impulses. Some corrections carries in many factors as: weather, time of year, property of a given waters, biological state of fishes and others. Hunting on fishes on electric current is at present times modern art. Electrofisher should meet many conditions and requirements in order to catch well and about this below.

Not going excessively into theory one should say, so that to catch fish well electrofisher should meet the following criteria:

1. Electrofisher should be maximum strong for a given battery (accumulator) - allowing this - we may enlarge zone of fishing. However, we should not forget, that fish has to swim up freely to landing net at optimum circumstances of fishing and in such manner not to hurt the fish and if it is necessary to release it (little fish, fry).
2. We should know, that in water it is important to ensure the flow of electric current (Amperes) and not voltage ( Volt).
3. Surface of electrodes should be possibly maximum in reasonable extent, to enlarge the flow of current and freely to operate them. Cathode should be a piece of 1, 5-2 metre of flexible copper line of thickness about 2 mm.
4. Intensity of impulses should be minimum - and in given time to give to waters suitable power.
5. Frequency of impulses should be regulated in range from 5 to 120 Hz.
6. Length of impulses should be in range circa 30 microseconds - 3 milliseconds. In case of smaller frequency wider impulse (length).
7. Electrofisher should properly work in range of resistivity from 20 to 500 ohms.
8. From battery we can courageously take current in amperes equal its capacity in Ah (Ampere-hours).

Scheme of electrofisher



PROP  
T  
  
PI  
  
PE  
M/  
AV  
CC  
LIT

- LEGEND:**
- EXISTING APPROVED RIP-RAP LOCATION
  - PHASE 1 - APPROVAL OF EXISTING UNDOCUMENTED RIP-RAP LOCATIONS
  - PHASE 2 - NEW RIP RAP LOCATION
  - PHASE 3 - NEW RIP RAP LOCATION
  - PHASE 4 - NEW RIP RAP LOCATION
  - PHASE 5 - NEW RIP RAP LOCATION
  - PHASE 6 - NEW RIP RAP LOCATION

*Grass  
Carp  
Removal  
Channel*

**MIROMAR LAKES 5 & 6 NORTH  
317.3 AC.**

**MIROMAR LAKES 5 & 6 SOUTH  
264.9 AC.**



(UNDOCUMENTED)  
RIP-RAP 340 LF±

(UNDOCUMENTED)  
RIP-RAP 340 LF±

VOTERRA RIP-RAP 1,280 LF±  
(DOS2004-00233)

ANACAPRI, CASTELLI, & MIROMAR  
LAKES PKWY. RIP-RAP 4,820 LF±  
(DOS2004-00232), (DOS2005-00305)

NORTH LAKE  
ISLAND  
RIP-RAP 209 LF±  
(LDO2013-00182)

EAST 100 AC.  
RIP-RAP 1,900 LF±  
(DOS2006-00005)

PORTOFINO  
RIP-RAP 390 LF±  
(DOS2006-00005)

PORTOFINO  
RIP-RAP 600 LF±  
(DOS2006-00005)

(UNDOCUMENTED)  
RIP-RAP  
1,070 LF±

RAVENNA  
RIP-RAP 230 LF±  
(DOS2005-00298)

(UNDOCUMENTED)  
RIP-RAP 140 LF±

(UNDOCUMENTED)  
RIP-RAP 130 LF±

(UNDOCUMENTED)  
RIP-RAP 110 LF±

(UNDOCUMENTED)  
RIP-RAP 2,490 LF

COSTA AMALFI  
RIP-RAP 250 LF±  
(DOS2008-00112)

NOT AT SHORELINE  
RETAINING WALL 360 LF±

(UNDOCUMENTED)  
RIP-RAP 3,850 LF±

(UNDOCUMENTED)  
RIP-RAP 2,330 LF±

PENNISULA  
RIP-RAP 1,360 LF±  
(DOS2012-00000)

DATE	9/17/14
DATE	
DATE	

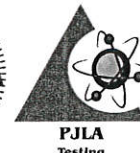
MIROMAR DEVELOPMENT CORP.  
**EAST 100 ACRES  
AT MIROMAR LAKES**  
LEE COUNTY, FLORIDA

DESIGNED BY:	CLK	DATE:	06/12/06
DRAWN BY:	JJH	DATE:	06/12/06
CHECKED BY:	CLK	DATE:	06/12/06
VERTICAL SCALE:	N/A	HORIZONTAL SCALE:	1" = 400'

**HM**  
ENGINEERS - PLANNERS - SURVEYORS  
LANDSCAPE ARCHITECTURE

6200 Whiskey Creek  
Fort Myers, FL. 3  
Phone : (239) 985-  
Florida Certificate  
Authorization No.





**Chain of Custody:** 2015-36643-00

**LABORATORY REPORT**

Page 1 of 2 Total

**Customer Company**

Company Name: Lake Masters-Lab  
Address: Po Box 2300  
Palm City, FL 34991

**Customer Contact**

Contact Person: Bill Kurth  
E-Mail Address: bill.kurth@lakemasters.com  
Phone: (239) 466-0403  
Fax: (239) 466-0400

**Waterbody Information**

Waterbody: Miromar Lakes - FL      Waterbody Size (acres): 225      Depth Average: 8'

**Sample Information**

Lab ID	Sample Location	Test Method	Results	Sampling Date	Sampling Time	Temp at Receipt (C)
31253	1 MAIN LAKE			01/27/2015		9.0
		<b>Total Kjeldahl Nitrogen (mg/L)</b> EPA 351.2	<b>1.4</b>			
		<b>Total Nitrate &amp; Nitrite (mg/L)</b> Campbell et al 2004	<b>0.090</b>			
		<b>Nitrite (mg/L)</b> EPA 354.1	<b>0.09</b>			
		<b>Nitrate (mg/L)</b> Calculated	<b>&lt; 0.02</b>			
		<b>Total Nitrogen (mg/L)</b> Calculated	<b>1.50</b>			
		<b>Total Phosphorus (µg/L)</b> EPA 365.3	<b>22.5</b>			
31254	2 OUTFALL			01/27/2015		9.0
		<b>Total Kjeldahl Nitrogen (mg/L)</b> EPA 351.2	<b>3.7</b>			
		<b>Total Nitrate &amp; Nitrite (mg/L)</b> Campbell et al 2004	<b>0.33</b>			
		<b>Nitrite (mg/L)</b> EPA 354.1	<b>&lt; 0.02</b>			
		<b>Nitrate (mg/L)</b> Calculated	<b>0.33</b>			
		<b>Total Nitrogen (mg/L)</b> Calculated	<b>4.01</b>			
		<b>Total Phosphorus (µg/L)</b> EPA 365.3	<b>223.3</b>			

**Original**