Triploid Grass Carp and Aquatic Plant Management

A Brief History

- Scientific Name: *Ctenopharyngodon idella*
- Common Names: grass carp, white amur
- Native to large river systems in Asia
- Grass carp can now be found in 45 states and common to the southeast

A Brief History (cont.)

- First imported to the U.S. in 1963 to control aquatic vegetation in aquaculture ponds
- Reproducing population was discovered in 1971 in the Mississippi drainage system
- Sterile carp were first produced in the U.S. in 1979 as inter-specific crosses between female grass carp and male bighead carp *Aristichthys nobilis* (Malone 1982)
- The methods for making the diploid carp sterile were developed in 1984.

Commonly Reach 30 lbs or More

Record weight is 99 lbs; length is 4.9 feet

Typically Live 10-15 Years,Unless…

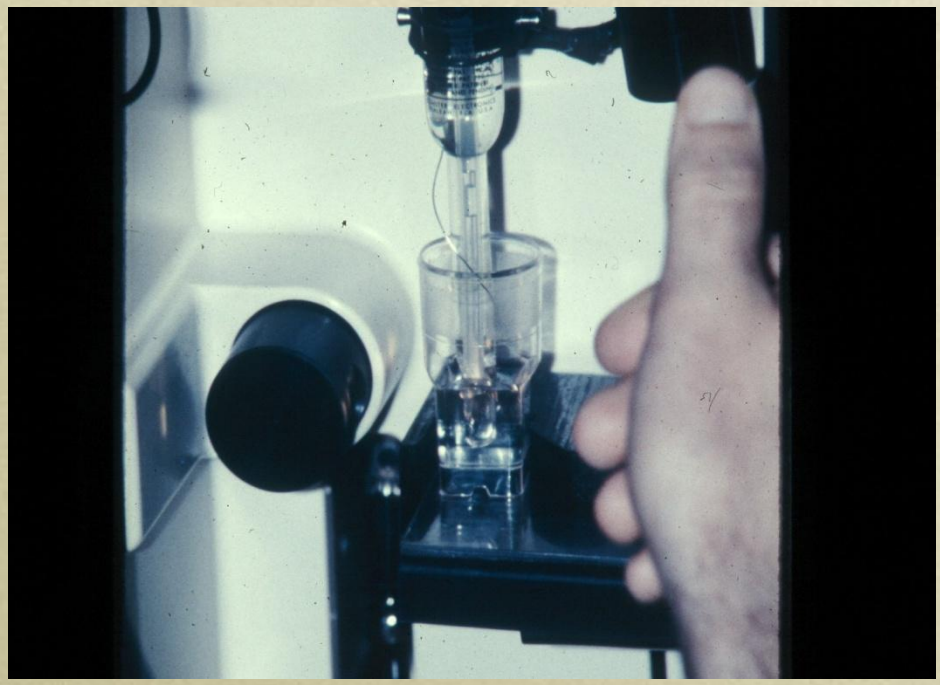
Largemouth Bass by FWC

River Otter by FWC

American Alligator by SFWMD

Osprey by www.wildphotosphotography.com

Triploid Production



Eggs are subjected to hydrostatic pressure resulting in three sets of chromosomes – rendering the fish sterile

Testing for Sterility

- Sterility of grass carp are tested by biologist who use specialized equipment which can measure the weight of the grass carp blood cells.

True or False

- Grass carp eat fish eggs, fish, and insects (F)
- Grass carp hurt the fishing (F)
- Grass carp “mess up” the water (T and F)
- Grass carp eat all plants (F)
- Once you stock them they will multiply like crazy (F)

Aquatic Plants

Pros of Aquatic Vegetation

- Nutrient uptake
- Aesthetics
- Bank stabilization
- Fish and wildlife habitat

By Michael Sowinski FWC

Cons of Aquatic Vegetation

- Limits boat and jet ski use
- Difficult to fish
- Major plant die-off can cause the dissolved oxygen to drop suddenly causing a fish kill
- Aesthetics

By Michael Sowinski FWC

Grass Carp Feeding Preferences Frequently Eaten

- Brazilian elodea
- Duckweed
- Elodea
- Hydrilla*
- Musk Grass (Chara)*
- Pondweed
- Slender Spikerush
- Southern Naiad*
- Widgeon Grass

By Michael Sowinski FWC

Hydrilla

* Present in Lake Pickett

Grass Carp Feeding Preferences Sometimes Eaten

- Algae, Filamentous
- Baby Tears*
- Bacopa *
- Banana Lily
- Bladderwort *
- Bog Moss *
- Bulrush
- Cattail *
- Coontail*
- Fanwort *
- Hygrophila

By Michael Sowinski FWC

Bog Moss

*Present in Lake Pickett

Grass Carp Feeding Preferences Sometimes Eaten (continued)

- Jointed Spikerush
- Knotgrass
- Limnophila *
- Maidencane *
- Naiad, Marine
- Nitella (Stonewort) *
- Rush Fuirena *
- Soft Rush
- Southern Water grass
- Water Meal
- Water Shield

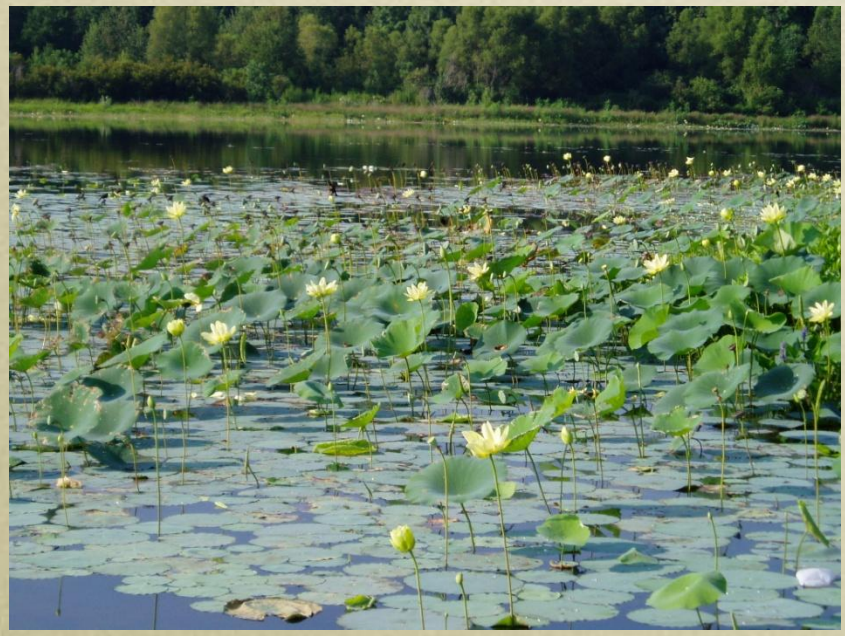
By Michael Sowinski FWC

Jointed Spikerush

* Present in Lake Pickett

Grass Carp Feeding Preferences Rarely Eaten

- Algae, Planktonic
- Alligator Weed*
- American Lotus
- Azolla (Mosquito Fern)
- Burhead Sedge
- Common Arrowhead
- Duck Potato
- Frog's Bit*
- Para Grass
- Parrot's Feather
- Pennywort (Dollarweed)*
- Pickerelweed*



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American Lotus

* Present in Lake Pickett

Grass Carp Feeding Preferences Rarely Eaten (continued)

- Red Ludwigia
- Salvinia, Giant
- Sawgrass*
- Sedges
- Smartweed*
- Spatterdock*
- Taro (Elephant Ear)
- Torpedo grass*
- Water Paspalum
- Water Hyacinth
- Water Lettuce
- Water Lily *

By Michael Sowinski FWC

Smartweed

* Present in Lake Pickett

When Should Grass Carp Be Used

- System dependent (What are the uses of that system)
  - Lakes
  - Golf Course Ponds
  - Canals
  - Storm water ponds

Typically, lake mangers are looking for at least a 30 percent cover of submerged aquatic vegetation.

Stocking Canals, Irrigation Ditches and Golf Course Ponds

- NO plants!
- “Green water”
- Loss of fish and wildlife habitat
- Protection of pumps

May stock 30-100 fish per acre in these systems

Historical Uses of Grass Carp

- During the 1980's the effects of grass carp and how to use this tool were just beginning to be understood.
- There are many systems which received elevated numbers of carp per acre.
- This resulted in the loss of most if not all submerged aquatic vegetation.

Courtesy SJRWMD

Stocking Rates

Stocking rates are difficult to predict due to:

- differences in vegetation coverage and densities, (e.g., total plant acreage compared to total water body acreage)
- plant species present

Stocking Rates (cont.)

- 2 fish per acre is usually safe stocking rate
- Could go a bit more conservative 1 fish per acre
- But need to wait for results!

Mortality

- Generally, at low original stocking rates, fish may need to be restocked every 3-5 years

- At high original stocking rates, fish may need to be restocked every 10 years

By Michael Sowinski FWC

Once Grass Carp are Stocked How Do You Get Them Out?

- Electro Fishing?
- Nets?
- Chemicals?
- Explosives?
- Time?

Grass Carp or Herbicides

- When treating aquatic vegetation grass carp in conjunction with herbicides is a standard best management practice.
- Regardless of the approach the entire loss of aquatic vegetation results in several negative qualities to the waterbody

Grass carp or Herbicides (cont)

- Some of the benefits to using just grass carp
  - Vegetation is reduced more slowly
  - Significant portion of the nutrient uptake is stored in the fish
  - Grass carp selectively consume plant species thereby leaving some species relatively unaffected.

Fish Barriers Keeping The Fish In

- Need to be of sturdy construction
- Gaps must be: 1.25” for 10” fish; 1.5” for 12”
- Bars can be vertical or horizontal
- Overflow should allow for major rain events to alleviate flooding

Barrier Issues

Poor Construction

Need to be Maintained

Barrier Issues II

Underwater Pipes

Poor Design

Barrier Issues III

What's Wrong with This Barrier?

Large Scale Stocking

Conclusion

Lake managers cannot with certainty predict the potential outcome of introducing grass carp to a system. However, if a thorough and objective survey of the system is conducted; they are more likely to determine problems which may arise.

Just a Reminder!

- Better to be very conservative in large water bodies using acres of vegetation instead of total surface acres
- There is always the possibility of the lake becoming totally clear of aquatic vegetation
- Use an adaptive management approach
- Be patient!!!
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