Ploidy Of Grass Carp In The Suwannee River, Florida

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Grass Carp Permitting In Florida

- Only Triploid Fish Permitted – Every Fish Tested For Ploidy By Producer
- Approximately 800 - 1500 Permits Issued Annually
- Permitted Sites Typically A Retention Pond And Less Than 50 Fish Permitted
- Barriers Required On Sites With Outlets
- No River Systems Have Been Permitted

Triploid = 3 sets of chromosomes = functionally sterile

Triploidy induced during production process by shocking the eggs (heat or cold shock) or putting them under hydrostatic pressure

Production of triploids not 100% and diploids must be destroyed

Diploid = 2 sets of chromosomes = capable of reproduction

Triploid Verification

- Triploid blood cells contain more DNA and the size of the triploid blood cell nucleus is larger than the diploid nucleus.
- Size of blood cell nucleus can be rapidly and accurately measured with a flow cytometer or Coulter Counter.
- Nucleus of blood smears can also be measured but not as reliable.

Grass Carp Reproductive Requirements

Long Stretch Of Flowing Water

Sufficient Current To Maintain Egg Buoyancy

Still Backwater Vegetated Areas For Juvenile Growth And Brood Stock Conditioning

❖Very Similar To Striped Bass Reproductive Requirements

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Grass Carp Food Habits

- Definite preferences –
  - Prefer hydrilla, southern naiad
  - Do not like but will eat vallisneria, coontail, hygrophila
  - Will not eat spatterdock
- Preferences change with age & season
  - e.g. large fish will eat cattail, maidencane in late summer & fall (cellulose intake to "bulk up" for winter?)

Large Numbers Of Grass Carp Observed At Manatee Springs In 2009

Questions?

Are grass carp present in FL rivers?

Are there diploid grass carp present in FL rivers?

If grass carp are present what are population numbers, distribution and ploidy?

If diploids are present are they reproducing?

Collected 27 Grass Carp At Manatee Springs Feb 3, 2010

Transported 21 Live Grass Carp For Ploidy Testing Feb 3, 2010

Largest and Smallest Grass Carp Tested For Ploidy (60.8 and 16.1 Pounds).

Of 21 Fish Tested For Ploidy

5 Were Determined To Be Diploid

(24% Of Sample)

Diploid Data

Fish #	Length	Weight	Ploidy	Sex/Condition
9	45 ¾ inches	44.1 pounds	2N	M / Good
11	48 inches	60.8 pounds	2N	F / Excellent
19	40 ¾ inches	41.7 pounds	2N?	M / Good
20	38 ½ inches	27.4 pounds	2N	M / Fair
21	42 ½ inches	29.1 pounds	2N	M / Poor
Average for All Fish	40.7 inches	31.8 pounds	3N/2N	

Immature eggs in large diploid female.

St. Johns River

Early 1990's some grass carp collected from Ocklawaha River at Rodman Dam tailrace.

Diploids verified from this sample by blood smears.

- Volusia Blue Springs has been seeing grass carp in increasing numbers very recently.

Where Are Diploid Grass Carp Coming From?

Other states – e.g. Georgia allowed use of diploids in early 1980's.

Escapement from producers.

Illegal introductions – Bear Lake 1970's; Hungry Jacks mid 1980's.

Escapement from permitted sites (triploids) – Tropical Storm Fay.

Remove Grass Carp?

- Grass carp are extremely difficult to capture, particularly with nets.
- Suwannee is an extremely large body of water.
- Large investment in personnel, cost, equipment, logistical considerations for a very low rate of return.

Further Research?

Population numbers, distribution, ploidy including other FL rivers.

Reproductive status of grass carp in rivers where diploid are present.

Food habits in rivers – what are grass carp eating, when, and where?

Grass carp age and population structure – are individuals continually being recruited into the population?

Answers to research questions have practical implications for freshwater fisheries management, manatee management, and springs working groups.

Recommendations

Revegetation efforts in Suwannee River should consider protection of new plantings from herbivore pressure until plants are well established (turtles, manatees, muskrats, beaver).

Establish permanently protected areas of desirable aquatic vegetation.

Smart and Dick (1999),Smart et al. (1996)

Questions?

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