

Briefing Report on Grass Carp

Grass carp, also called the white amur, are native to the Amur River in China and Russia. They were introduced into the United States in 1963 for testing as a biological weed control agent in Arkansas and Alabama. Escapees from hatchery production in the mid-1960's were discovered in the Mississippi River in Illinois in 1971.

Because of their rather inefficient digestive tract, grass carp must ingest large quantities of aquatic vegetation in order to thrive. Until the grass carp reaches 4 to 6 inches in length, they feed on filamentous algae. After reaching this size, they switch to rooted plants with their preference being succulent submerged species such as hydrilla. When feeding, they shear off weed tips rather than uprooting vegetation like the common carp. Growth can be rapid in the presence of adequate food and in their native rivers they are known to reach 80 pounds. Maturity is generally achieved at 3 to 4 years.

Spawning Requirements

The grass carp only spawns naturally during the spring in large rivers having flows of about 12,000 ft/sec or more. Rising or falling river levels, temperatures about 68°F, and the presence of turbulence, such as below dams or islands, are required to trigger spawning. The eggs must be carried along in 3.3 ft/sec flow until hatching. The length of river needed to sustain the eggs until hatching varies, but probably exceeds 31 to 50 miles depending on temperature. The young must have access to sheltered areas containing aquatic vegetation in order to survive. The fish are incapable of spawning in lakes or other still waters. In order to spawn grass carp in hatcheries, the adults have to be injected with hormones and the eggs must be stripped manually. Although grass carp spawn in freshwater, fish two years and older can survive high salinities (but food intake is affected).

Present Management and Potential Problems

Initially banned in 35 states, the production of genetically sterile triploid grass carp in the 1980's by a few commercial fish growers in Arkansas and elsewhere stimulated interest in the use of this fish for management purposes outside of the deep south. Many states now allow the importation of sterile grass carp for weed control use under permits issued by the individual state.

It is conceivable that a thriving population could bring about environmental damage through the destruction of desirable weed beds needed as cover for other fish or food for waterfowl. Weed beds are of particular concern in the Chesapeake system where efforts are underway to restore submerged aquatic vegetation (SAV). It is within the realm of possibility that the larger rivers in the mid-Atlantic area, such as the Delaware and Potomac, might prove suitable for grass carp reproduction, but the likelihood of this occurring appears low. However, the fish are known to undergo long migrations, so any accidental or purposeful release in the Delaware or Chesapeake systems would give the fish possible access to six states.

The Delaware Experience

In Delaware, triploid grass carp were introduced into Ingrams Pond (Millsboro) in the spring of 1987 on an experimental basis. A migration barrier was erected at the Ingrams Pond dam prior to this introduction to prevent the movement of grass carp from the pond. We have found that the triploid (sterile) grass carp are very selective in their feeding preferences and particular care must be taken that the target aquatic weed is a preferred plant species. Also, it is very difficult to obtain partial control of aquatic weeds using triploid grass carp. They provide either total removal or negligible control. In Ingrams Pond, three stockings over a period of six years were necessary before any impact on hydrilla was noted. Following almost complete removal of this plant by 1994, hydrilla is still (2006) now present only in water less than six inches deep. Floating mats of filamentous algae have increased substantially subsequent to the decline of the hydrilla. Removal of the target plant species by the grass carp often allows

another species of plant that is not eaten by the fish to take over as the over-abundant nutrients present in the pond have not been removed. In addition, the sport fish population of a pond may be negatively affected by removal of much of the vegetative fish cover within the pond. Therefore, the Division does not advocate stocking of grass carp in any public waters designated as fishing ponds.

The Certification Process

Most states outside of the deep south require that any grass carp imported into their areas be certified as triploid, i.e. having a third set of chromosomes (making them functionally sterile). Although the production of triploid grass carp requires a temperature or pressure shock to the eggs prior to fertilization, this process does not result in all triploids. Because it is impossible to distinguish between a sterile (triploid) and a fertile (diploid) grass carp by appearance, a blood test is required. Fish producers run blood tests on all fish to select triploid individuals. Certification of triploidy by the U.S. Fish & Wildlife Service (USFWS) involves a second inspection just prior to shipment. The standard protocol is to select 120 individual fish from any size shipment for testing in the presence of a USFWS agent. If any one of those 120 fish is found to be diploid, the shipment is rejected. With larger shipments, it is possible that diploid fish could be missed. As a signatory to the Chesapeake Bay Policy for the introduction of non-indigenous (not native) species, the Delaware Division of Fish & Wildlife requires blood tests of all fish in shipments destined for watersheds that pose the possibility of escaped fish migrating to the Chesapeake Bay. A moratorium on the stocking or re-stocking of any grass carp has been established for any systems that drain directly into any Chesapeake Bay tributary.

Please review the Delaware Grass Carp Policy for a complete discussion of the conditions under which a possession permit is granted.

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