

The use of grass carp (*Ctenopharyngodon idella*) in the United States:

Production, triploid certification, shipping, regulation, and stocking recommendations for reducing spread throughout the United States



Report to the U.S. Fish and Wildlife Service
From the Mississippi Interstate Cooperative Resource Association

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Executive Summary

Following approval of the national ‘Management and Control Plan for Bighead, Black, Grass, and Silver Carps in the United States’ (National Asian Carp Plan; Conover et al. 2007) by the national Aquatic Nuisance Species Task Force (ANS Task Force) in 2007, the Mississippi Interstate Cooperative Resource Association (MICRA) and the Mississippi River Basin Panel (MRBP) identified several recommendations from the National Asian Carp Plan as high priority needs, and have been working to implement these recommendations. One such recommendation is the independent review and evaluation of the effectiveness of the U.S. Fish and Wildlife Service (USFWS) National Triploid Grass Carp Inspection and Certification Program (NTGCICP) to identify reasonable actions, where necessary, to improve the integrity, efficiency, and effectiveness of the program to minimize the risk of accidental or deliberate unauthorized introductions of diploid Grass Carp (Recommendation 3.1.6.1; Conover et al., 2007).

MICRA organized a steering committee to develop a Scope of Work for the recommended independent review of the NTGCICP. The steering committee was co-chaired by the MRBP Executive Committee and consisted of state ANS coordinators, USFWS NTGCICP inspectors and administrators, representatives of the National Association of State Aquaculture Coordinators, and commercial triploid Grass Carp producers and distributors. The steering committee determined that a broader review of Grass Carp regulation and use in the United States (U.S.) was warranted. The USFWS funded MICRA to complete a proposed ‘National Analysis of Grass Carp Regulation, Production, Triploid Certification, Shipping, and Stocking’ (National Analysis) in June 2012.

MICRA sub-contracted HDR Engineering, Inc. (HDR) to complete the independent National Analysis of the Grass Carp industry in the U.S. and to provide recommendations to prevent unintentional and illegal introductions of diploid and triploid Grass Carp. HDR conducted more than 300 telephone interviews with representatives from the USFWS NTGCICP, state natural resource management agencies, and Grass Carp producers and distributors. HDR also completed 12 site visits to commercial production, grow out, and distribution facilities in Alabama, Arkansas, Illinois, Indiana, Kentucky, Mississippi, and Missouri to gain a more thorough understanding of the size, scope, and nature of the Grass Carp industry.

This report summarizes the results of the in-depth National Analysis completed by MICRA and HDR and concludes with a discussion of recommendations proposed by MICRA. Results are presented and discussed for each of the following objectives: 1) legal use of diploid Grass Carp; 2) triploid Grass Carp production; 3) USFWS triploid Grass Carp certification; 4) distribution/shipping of Grass Carp; 5) inspection of Grass Carp shipments and enforcement of regulations; 6) state Grass Carp regulations; 7) pathways for the introduction of diploid Grass Carp into the triploid Grass Carp supply chain; and 8) recommendations to reduce the risk of diploid Grass Carp introductions. The full report of HDR’s findings and recommendations submitted to MICRA is included in Appendix 1 (Stuewe, 2014).

Similar to findings of previous reviews of Grass Carp regulation and management in the U.S. (Wittman, 2014; Conover et.al, 2007), HDR concluded that a national policy strategy is needed to effectively minimize the risks of unintentional and illegal introductions of diploid and triploid Grass Carp

in the U.S. State regulations regarding the use of Grass Carp have been varied, inconsistent, and even contradictory since private fish hatcheries began marketing Grass Carp in 1972. Despite the widespread use of Grass Carp as a management tool and the existence of self-sustaining populations within portions of the Mississippi River Basin and other watersheds, Grass Carp are an aquatic invasive species (AIS) that most states in the U.S. are attempting to prevent from establishing self-sustaining populations within or along their borders. A weak link problem occurs when regulations of individual jurisdictions increase the region-wide risk of species introductions, especially in adjacent jurisdictions (Peters and Lodge, 2009).

To achieve a national policy strategy will require all states to adopt consistent and complimentary regulations that either prohibit Grass Carp entirely or restrict Grass Carp use to certified triploids only. Important components of the national policy strategy would include an effective triploid Grass Carp certification program (such as the NTGCICP), a minimum of standard state regulations, record keeping, and requirements for written Standard Operating Procedures (SOPs) and Best Management Practices (BMPs). The report by HDR (Appendix 1; Stuewe 2014) provides a suite of recommendations regarding state regulations, inspection and enforcement, record keeping, education and awareness, the NTGCICP, and provides example BMPs for certified triploid Grass Carp producers. Due to the complexity of regulation and use of Grass Carp, HDR recommends a forum for federal, state, and private entities involved in the Grass Carp industry to ensure the impacts of recommended actions to private, state, and federal entities have been accounted for prior to implementation.

Based on the results of the National Analysis, recommendations provided by HDR, and comments received from USFWS, state, and Grass Carp industry representatives, MICRA has developed the following minimum recommendations for a consistent national policy strategy for Grass Carp to minimize the risk of unintentional and illegal introductions of diploid and triploid Grass Carp in the U.S. The first five recommendations address state regulatory needs to provide a consistent national policy strategy for Grass Carp. Two recommendations are provided for the USFWS to improve the efficacy of the NTGCICP. A final recommendation addresses information and outreach needs for state agencies, USFWS, and industry to increase awareness and compliance with Grass Carp regulations.

Recommendations:

1. All states prohibit the production, sale, live shipment, stocking, import, and export of diploid Grass Carp except for permitted diploid brood stock at appropriately licensed production facilities.
2. States that allow triploid Grass Carp production should develop a consistent set of minimum standards (SOPs and BMPs), permit requirements, and record keeping for diploid Grass Carp broodstock.
3. States that allow the legal importation of triploid Grass Carp should adopt consistent, uniform regulations that allow only USFWS certified triploid Grass Carp (or an equivalent state approved certification program –: e.g., South Carolina and Louisiana).

4. Increase random inspections and enforcement of relevant regulations in states that allow the importation of certified triploid Grass Carp.
5. Improve state regulation of the live fish shipping industry and develop standards for Grass Carp distributors.
6. Modify the scope and Standards of the USFWS National Triploid Grass Carp Inspection and Certification Program (NTGCICP), including direct participation of states and Grass Carp distributors.
7. The USFWS should work with states, triploid Grass Carp producers, and other partners to develop defensible ploidy testing procedures for quality control and law enforcement purposes in support of state random inspection programs.
8. Develop and provide information about NTGCICP, Grass Carp regulations, and best management practices for natural resource managers, aquaculturists, and the general public.

Recommendations, Justification, and Considerations

Goal: Establish a national policy strategy supported by consistent (or compatible) state regulations for Grass Carp which prevents unwanted spread, unintentional and illegal introductions, and the establishment of reproducing populations in new parts of the Mississippi River Basin, the Great Lakes Basin, and the rest of the nation.

Recommendation 1: All states prohibit the production, sale, live shipment, stocking, import, and export of diploid Grass Carp except for permitted diploid brood stock at appropriately licensed production facilities.

Justification:

HDR found that 16 of 20 distributors interviewed ship both diploid and triploid Grass Carp. The ability for distributors to possess and ship both diploid and triploid Grass Carp is considered by many to be the highest risk for unintentional and illegal introductions. HDR reports that 14 of 41.5 states (32%) that prohibit diploid Grass Carp identified one or more known introductions of diploid Grass Carp. (A half state results from different regulatory requirements in Colorado on the west and east sides of the continental divide). HDR summarized numerous problems and pathways associated with both diploid and triploid Grass Carp in the supply chain (Appendix 1, Section 4.2.8).

The intent of this recommendation is to remove diploid Grass Carp from the commercial Grass Carp supply chain, thereby reducing the number of entities handling diploid Grass Carp (i.e., vectors of introduction) and the risk of illegal or accidental introductions. Achieving the intended result will require the cooperation of all states. The absence of diploid Grass Carp in the supply chain will eliminate the legal shipment of diploid Grass Carp (with or without triploids) and will minimize the opportunity for unintentional and illegal shipments of diploid Grass Carp. This recommended change will reduce the risk of introduction by several pathways of concern identified in the National Asian Carp Plan (Conover et al. 2007) including: stocking of Grass Carp for biological control (3.1.2.1), interstate transport of live Grass Carp to food fish markets (3.1.17), unauthorized releases by individuals (3.1.18), and contamination of diploid Grass Carp in shipments of other farm-raised fish (3.1.14).

A Lacey Act listing of diploid Grass Carp would make importation and interstate transport of live diploid Grass Carp illegal, but would not prevent states from continuing to ship and authorize the use of diploid Grass Carp within their own borders. Removing diploid Grass Carp from the commercial supply chain therefore is dependent upon consistent state regulations. All seven states in the continental U.S. that allow stocking of diploid Grass Carp are in the Mississippi River Basin, and achieving a consistent national policy strategy will require these states to make regulatory changes. Coordinated regulation changes as part of a national policy strategy may provide an advantage over each state attempting to implement new regulations independent of the other states.

As a first step towards implementation, it is recommend that MICRA host a meeting of the states that allow diploid Grass Carp production and stocking to discuss opportunities and barriers to implementing this recommendation.

Considerations:

The recommendation to develop consistent regulations to prohibit the use of all diploid Grass Carp except for permitted diploid brood stock at appropriately licensed facilities is based on recommendations from HDR and Recommendation 3.1.2.1 in the National Asian Carp Plan (Conover et al., 2007). The National Asian Carp Plan limits this recommendation to Grass Carp in “non-aquaculture” waters. Certified triploid Grass Carp cost two – three times more than diploid Grass Carp. The aquaculture industry – particularly fish farms that use large numbers of diploid Grass Carp – may oppose regulations that would require them to use certified triploid Grass Carp exclusively. Resource managers need to work with the aquaculture industry to find economically viable alternatives to diploid Grass Carp because of the importance of their removal from the commercial supply chain.

One potential alternative within the recommended national policy strategy is for current diploid states to develop rules and regulations that would allow a commercial facility to obtain a permit for the use of uncertified triploid Grass Carp. The cost for using uncertified triploid Grass Carp is expected to be much less than certified triploids, perhaps similar in cost to diploid Grass Carp. Minimum standards should be used to require stocking of uncertified triploids that contain no greater than a maximum percentage of diploids (e.g., 5%). If a diploid Grass Carp state interested in providing the uncertified triploid Grass Carp option does not have a production facility within the state that is capable of producing high percentage batches (>95%) of uncertified triploid Grass Carp, it may be necessary to alter the recommendation to allow for the restricted interstate shipment and stocking of uncertified triploid Grass Carp by NTGCICP producers. If this approach is taken, it is recommended that the NTGCICP evaluate the feasibility of oversight for uncertified triploid Grass Carp and their movements between and among participating facilities. As a condition of their permit, states should require participating fish farms to provide written SOPs and BMPs, by which they operate their entire facility to prevent all Grass Carp from escaping the facility. The SOP or BMP must contain specific actions to prevent escapement. States which make this option available to commercial fish farms should ensure compliance with permit requirements, and SOPs and BMPs via annual inspections. These items are discussed further in Recommendation 6.

Rather than simply prohibiting possession, it may be necessary for states to specify production, sale, live shipment, stocking, import, and export when developing rules and regulations prohibiting diploid Grass Carp. This will depend on historic regulations regarding diploid Grass Carp stocking and whether or not a state chooses to license the operation of triploid Grass Carp production facilities (either certified or uncertified). Making diploid Grass Carp possession illegal would be problematic for citizens in those states that have allowed businesses or individuals to stock diploid Grass Carp in the past, unless it is possible to include a grandfather clause for fish that have been previously stocked.

States will also need to consider whether or not to prohibit all shipments of diploid Grass Carp or only “live shipments.” Prohibiting the shipment of all diploid Grass Carp would make it illegal for commercial fishermen to transport dead Grass Carp from the river to a processing facility or market. Rules that prohibit the live shipment of Grass Carp are consistent with Recommendation 3.1.15.1 in the National Asian Carp Plan encouraging states to prohibit the possession of live wild-caught Asian carps (Conover et al., 2007).

HDR identified 16 state-operated hatcheries in six states that produce or hold Grass Carp (Appendix 1, Table 2). Of these facilities, seven are currently producing diploid Grass Carp. Two states that allow the use of diploid grass carp have adopted recent policy changes and no longer use diploid grass carp on state facilities; Iowa has eliminated the use of all grass carp on state facilities, and Alabama reported purchasing USFWS triploid grass carp for use on state facilities.

It will also be necessary to take into consideration the possession and transportation of diploid Grass Carp that may be present at triploid grass carp production facilities prior to inspection and screening of individual fish to remove diploids. There are certain to be more nuances than those identified in this report that must be considered and addressed. Close coordination and communication with the aquaculture industry will be critical to develop effective strategies that keep diploids from entering the Grass Carp supply chain.

These considerations are addressed further in Recommendation 6.

Recommendation 2: States that allow triploid Grass Carp production should develop a consistent set of minimum standards (SOPs and BMPs), permit requirements, and record keeping for diploid Grass Carp broodstock.

Justification:

This recommendation addresses the exception in Recommendation 1 to allow for permitted diploid brood stock at appropriately licensed production facilities. Diploid Grass Carp are necessary for the production of triploid Grass Carp. Therefore, when states with triploid Grass Carp production facilities implement Recommendation 1 by developing regulations prohibiting diploid Grass Carp, it will be important for these states to carefully craft rules regarding exceptions for all aspects of diploid Grass Carp possession, use, and disposal.

The National Asian Carp Plan recommends that possession of diploid Grass Carp be restricted through permits to licensed or authorized certified triploid Grass Carp producers (Conover et al., 2007). HDR recommends a state aquaculture permit, approved SOPs and BMPs, and an annual facility inspection be required to produce or hold diploid Grass Carp. Record keeping should be implemented at these facilities for careful tracking of disposition and husbandry of all diploid Grass Carp – whether produced as part of the triploid induction process or held for broodstock. Compliance with permit requirements including SOPs, BMPs, facility inspections, and record keeping

should be part of the license and permit approval and renewal processes. At a minimum the SOPs/BMPs should outline procedures for screening outflows, labeling tanks, preventing the mixing of diploid and triploid Grass Carp and knowing state regulations as they pertain to maintenance and stocking. In addition, record keeping forms should be drafted and producers required to maintain stocking and sales records as a condition of their state permitting. At a minimum, the form should indicate the number, ploidy, name and address of customer, and name of receiving state.

Considerations:

Minimum standards and permit requirements should address transportation and sales of Grass Carp broodstock in the rare instances where such broodstock need to be exchanged between farms. Ideally each state would prohibit import and export of diploid Grass Carp so that there are no legal interstate shipments of diploid Grass Carp; however, such details would need to be further coordinated with Grass Carp producers in each state and appropriate rules and regulations carefully crafted. Disposition or disposal of unwanted diploid broodstock should also be addressed in minimum standards, record keeping, and permit requirements.

There are nine commercial certified triploid Grass Carp producers which participate in the NTGCICP; these producers are located in Alabama, Arkansas, Georgia, Illinois, and South Carolina. There are three additional commercial triploid Grass Carp producers which do not participate in the NTGCICP, and they are located in Florida and Missouri (Glennon, 2014). It is recommended that these seven states work together to develop common language for the recommended minimum standards, permit requirements, and record keeping.

Recommendation 3: States that allow the legal importation of triploid Grass Carp should adopt consistent, uniform regulations that only allow only the use of USFWS certified triploid Grass Carp (or an equivalent state approved certification program – e.g., South Carolina and Louisiana).

Justification:

The National Asian Carp Plan and HDR both recommend a consistent state regulatory framework, and the National Asian Carp Plan specifically recommends that all states either prohibit all Grass Carp or restrict stocking to certified triploid Grass Carp only. While Recommendations 1 and 2 address regulations specific to diploid Grass Carp, Recommendation 3 addresses consistency of triploid Grass Carp regulations.

Twenty-seven states allow only certified triploid Grass Carp and require certification for all triploid Grass Carp shipments. Eleven of these states (Arizona, California, Connecticut, Delaware, Illinois, Louisiana, Nevada, New Mexico, North Carolina, Ohio, and South Dakota) require certification from either the USFWS NTGCICP or from a public or private lab for certified triploid Grass Carp shipments (Glennon, 2014). Louisiana must approve any lab other than the USFWS NTGCICP which is to certify triploid Grass Carp before a certification can occur (Glennon, 2014). South Carolina requires all Grass Carp shipments to be tested by the state upon entry.

The National Asian Carp Plan states that the effective use of triploid Grass Carp to prevent self-sustaining populations from becoming established is dependent upon the effectiveness of an inspection program to identify and remove diploid fish. Some states that require triploid Grass Carp do not require certification or do not specify the certification requirements. Florida does not require USFWS certification for intrastate shipments, and Georgia does not require USFWS certification for shipments from Florida or Alabama (Glennon, 2014). The risk posed to the certified triploid Grass Carp supply chain by states that currently allow the stocking of uncertified triploid Grass Carp could be eliminated if those states changed regulations to require NTGCICP (or equivalent state approved program) certification of all Grass Carp (Glennon, 2014). The proposed use of uncertified triploid Grass Carp in the considerations for Recommendation #1 applies only to appropriately permitted aquaculture facilities – it is not recommended that uncertified triploid Grass Carp be used for stocking into the wild. The proposed limited use of uncertified triploid Grass Carp does present some risk to the certified triploid Grass Carp supply chain; however the risk would be much less than the widespread use of uncertified triploid Grass Carp and could be managed through permits, rules, and regulations.

The USFWS NTGCICP is the most widely used triploid Grass Carp certification program. Following a review and evaluation of the NTGCICP, HDR reported that producers in the program are operating with a high degree of precision and accuracy, and concluded that the program is effective in preventing diploid Grass Carp from leaving a participating producer's facility as alleged triploid Grass Carp. This is a result of requiring every fish to be tested and a subset re-tested, tight QA/QC, penalties and incremental costs associated with failures, and clearly defined expectations and requirements specified in published standards and a signed MOA between the USFWS and each participating Grass Carp producer.

Specification of an approved triploid Grass Carp certification program by the states would ensure effective implementation of triploid Grass Carp management practices and the proposed national policy strategy. Consistent regulations and requirements among states will assist enforcement of state regulations regarding importation of Grass Carp.

Considerations:

There is no direct fee for a state to participate in the NTGCICP. Although all inspectors are currently located in USFWS Regions 3 and 4 (Midwest and Southeast, respectively), the NTGCICP is a national program and it is required to provide inspection services wherever requested in the U.S. The USFWS was authorized by Congress (Public Law 104-40; November 1, 1995) to “charge reasonable fees for expenses to the federal government for triploid Grass Carp certification inspections.” Triploid Grass Carp producers who choose to participate in the NTGCICP are charged fees based on the numbers of fish inspected. These fees are typically passed on to the consumer as an increased cost per fish. Given high enough demand, the USFWS might consider adding inspectors in new locations to reduce staff time and the travel costs to conduct triploid Grass Carp certification inspections, ultimately reducing the cost to consumers.

Participation in the NTGCICP would require a small amount of staff time for states that choose to actively participate in the program. Although there are currently no standards or requirements for state participation, it is recommended that the USFWS seek the active involvement of states in the administration and coordination of the NTGCICP program. The USFWS and participating producers typically meet once per year to review NTGCICP program standards and discuss necessary improvements. Additionally, USFWS inspectors provide the states with a copy of all certificates issued immediately following each inspection. State staff time would be required for administration and coordination of the program between the USFWS and state agency or agencies responsible for Grass Carp regulation. When possible, states should also conduct random inspections of certified triploid Grass Carp shipments and enforce state regulations (see Recommendation 4).

Recommendation 4: Increased random inspections and enforcement of relevant regulations in states that allow the importation of triploid Grass Carp.

Justification:

HDR reports that one of the weaknesses of the NTGCICP is that it lacks authority for enforcement of regulations. The NTGCICP involvement ends with the issuance of a Grass Carp Ploidy Release Authorization (Triploid Certificate) to the participating commercial triploid Grass Carp producer. The triploid certificate must accompany the shipment of certified triploid Grass Carp and each shipment is subject to inspection by state law enforcement personnel. Since the NTGCICP does not have a law enforcement component, inspection of Grass Carp shipments and enforcement of regulations is dependent upon the receiving states (Conover et al., 2007). Increased enforcement activities would be an effective means to ensure diploid Grass Carp do not enter the triploid Grass Carp supply chain (Glennon, 2014) and prevent unwanted introductions.

To address the illegal distribution and sale of diploid Grass Carp as certified triploid Grass Carp, the National Asian Carp Plan recommends that states conduct routine and random inspections of all live Grass Carp shipments within their state (Recommendation 3.1.3.2). Shipments of live Grass Carp frequently enter or move within many states. Natural resources management agencies should require the inspection of shipments of live Grass Carp to enforce and encourage compliance with existing or new regulations. Wittman et al. (2014) recommended inspection program checkpoints at the point of introduction as well as at the point of production to ensure that diploid Grass Carp do not enter the environment. States receiving shipments of triploid Grass Carp certified by USFWS should be encouraged to report the findings of random inspections to the USFWS NTGCICP.

The potential risk of unintentional and illegal introductions is substantially increased by a lack of inspections and enforcement by states. Only 13 states require either random or planned inspections of Grass Carp shipments, meaning 37 states (74%) have no inspection requirements. Of the 38 states that allow the use of Grass Carp in some form, 12 (32%) perform random inspections. Fifteen states – three which prohibit all Grass Carp, one which allows both diploids and triploids, and 11 that only allow certified triploid Grass Carp – conduct manual inspections. Most inspections consist of checking permits, labeling, and proof of certification. Ploidy testing of Grass Carp

shipments is conducted rarely. HDR reports that few states (6%) that prohibit diploid Grass Carp randomly sample fish in a shipment for ploidy determination. Only 9 of the 27 states (33%) which require certification of triploid Grass Carp shipments report enforcement of certified triploid Grass Carp regulations.

Considerations:

A common theme reported to HDR is that states do not have adequate resources to provide necessary law enforcement for Grass Carp shipments. Many states do not have the equipment or expertise to determine ploidy of fish in inspected shipments and may need assistance to provide for enforcement of regulations (Conover et al., 2007). The National Asian Carp Plan recommends (3.1.3.3) that the USFWS should provide ploidy determination for states conducting inspections of Grass Carp shipments. It may be possible to build additional authorization and fees into the NTGCICP for producers to provide additional QA/QC testing in conjunction with random state inspections of certified triploid Grass Carp shipments. However, law enforcement is not a component of the NTGCICP and triploid Grass Carp producers are likely to object to the use of NTGCICP funds to support expenses in support of state law enforcement. States may want to seek a new Congressional authorization for USFWS (e.g., Fish Technology Centers) to provide ploidy determination and collect fees in support of state law enforcement efforts related to the shipment of live grass carp (see Recommendation 7). In the absence of rigorous state inspection programs and law enforcement, consistent state regulations prohibiting diploids and restricting the use of triploid Grass Carp to USFWS certified triploids would provide the greatest protections to prevent the accidental or illegal introductions of diploid Grass Carp.

Recommendation 5: Improve state regulation of the live fish shipping industry and develop standards for Grass Carp distributors.

Justification:

Standards or regulations are warranted to prohibit the shipment of certified triploid Grass Carp on the same vehicle with uncertified triploid or diploid Grass Carp. The NTGCICP does not have authority over the shipment and distribution of certified triploid Grass Carp. Recent and past law enforcement investigations and convictions in various states have found regulatory violations related to the shipping and stocking of Grass Carp (IL DNR 2014, State of Michigan 2012). HDR identified 393 businesses involved in some aspect of the commercial supply chain for Grass Carp. Of the 184 businesses contacted by HDR, 177 (96%) are involved in the distribution of Grass Carp. Most identified risks of unintentional and illegal introductions are associated with the shipment and distribution of live Grass Carp, especially by third party businesses not associated with the production and certification of triploid Grass Carp.

In addition to working with the USFWS to develop NTGCICP standards for distributors of certified triploid Grass Carp (see Recommendation 6), states should develop complimentary standards and regulations for live-fish haulers. Building on recommendations by HDR, states should require all live fish distributors to be licensed or permitted. To improve oversight of the live fish shipping industry

and reduce the risk of unintentional and illegal introductions of diploid or triploid Grass Carp (or any non-target fish), states should develop minimum standards (including SOPs), licensing and permit requirements, and review regulations for live fish haulers. These facilities should be subject to annual inspections to ensure compliance. It is recommended that states work together through organizations such as the Aquatic Nuisance Species Task Force Regional Panels or their host organizations (such as MICRA or the Great Lakes Commission) to coordinate practical minimum standards, SOPs, permit requirements and regulations. At minimum, adequate record-keeping should be required by Grass Carp distributors that includes the number, ploidy, name and address of customer and name of receiving state.

Considerations:

The National Asian Carp Plan includes several recommendations to reduce risks associated with the shipment of live farm-raised Asian carps, including Grass Carp (Recommendation 3.1.16.1 – 3.1.16.5) (Conover et al., 2007). Additional oversight of the live fish hauling industry could also prevent the unintentional introduction of Grass Carp in shipments of catfish, baitfish, and other species. Following an assessment of urban fishing ponds for Bighead Carp, the Illinois Department of Natural Resources (IDNR 2011) concluded that stocking of farm-raised fish can result in the unintentional introduction of Asian carps, including Grass Carp. As a result, the IDNR decided to formalize a policy to ensure that future fish contracts for the state’s urban fishing program will be made only with producers that can guarantee that no Asian carps are stocked in rearing ponds for Channel Catfish or other species.

Recommendation 6: Modify the scope and Standards of the USFWS National Triploid Grass Carp Inspection and Certification Program (NTGCICP), including direct participation of states and Grass Carp distributors.

Justification:

Direct engagement of responsible state agencies and commercial Grass Carp producers and distributors in the administration and operation of the NTGCICP is warranted. The purpose of the USFWS’s NTGCICP is to provide assurance to state natural resource agencies that shipments of certified triploid Grass Carp do not contain diploids (USFWS, 2014). The NTGCICP specifies requirements for USFWS inspectors and private producers, but has no enforcement authority over shipments. It is the responsibility of the states to inspect shipments of certified triploid Grass Carp and to enforce state Grass Carp regulations; however, HDR reported that the potential risk of unintentional and illegal introductions of diploid Grass Carp is substantially increased by a lack of inspections and enforcement by states. Recommendation 3.1.6.2 of the National Asian Carp Plan suggests state natural resource management agencies should be actively involved in meetings of producers and inspectors (Conover et al., 2007).

Considerations:

As a condition of their MOA, the USFWS NTGCICP should require participating producers to provide written SOPs or BMPs by which they operate their entire facility to prevent diploid Grass Carp from

entering the triploid supply chain and to prevent diploid Grass Carp from escaping the facility. In addition, NTGCICP should consider revising the Triploid Certificate to more accurately reflect the intent of the program.

After a failed ploidy inspection as the result of the discovery of a diploid fish, the participating producer should be required to use an elevated sample size during a predetermined number of successful subsequent inspections to demonstrate adequate quality control. As discussed in Recommendation 4, it may be possible to build additional authorization and fees into the NTGCICP for producers to provide additional QA/QC testing in conjunction with random state inspections of certified triploid Grass Carp shipments. This could be particularly useful when a diploid fish is identified in a certified triploid Grass Carp shipment that is no longer in the chain-of-custody of the production facility.

As proposed in Recommendation 1, some states that currently allow diploid Grass Carp may want to consider rules and regulations that would allow certain commercial aquaculture facilities to obtain a permit for the use of uncertified triploid Grass Carp. States should require any facility with uncertified triploid Grass Carp to provide written SOPs or BMPs by which they operate their entire facility to prevent all Grass Carp from escaping the facility. To control QA/QC of uncertified triploid Grass Carp, states could require all uncertified triploid Grass Carp to be purchased from producers actively participating in the NTGCICP (i.e., possess a signed and valid MOA with USFWS). States could also limit the stocking of uncertified triploid Grass Carp to production lots that have tested as 95% triploid or greater. To eliminate the possibility of contamination of the certified triploid Grass Carp supply chain, states could also require that any uncertified triploid Grass Carp sold to permitted facilities be shipped only on the NTGCICP producer's vehicle.

Recommendation 7: The USFWS should work with states, triploid Grass Carp producers, and other partners to develop defensible ploidy testing procedures for quality control and law enforcement purposes in support of state random inspection programs.

Justification:

A common theme reported to HDR is that states do not have adequate resources to provide necessary law enforcement. The National Asian Carp Plan notes that "states do not have the equipment and expertise to determine ploidy of fish in inspected shipments and may need assistance to provide for enforcement of regulations" and recommends (3.1.3.3) that the USFWS provide ploidy determination for states conducting inspections of Grass Carp shipments (Conover et al., 2007). The USFWS was authorized by Congress (Public Law 104-40; November 1, 1995) to "charge reasonable fees for expenses to the federal government for triploid Grass Carp certification inspections." The National Asian Carp Plan also recommends (3.1.3.3) that additional fees be built into the NTGCICP to reimburse USFWS for ploidy determination in support of random state inspections of certified triploid Grass Carp.

Considerations:

The USFWS has the equipment and expertise necessary to provide Grass Carp ploidy determination services for the states. Such technical assistance could fulfill two important functions: QA/QC as part of the NTGCICP, and support for state law enforcement efforts. As discussed in Recommendation 4, it may be possible to build additional authorization and fees into the NTGCICP for producers to provide additional QA/QC testing in conjunction with random state inspections of certified triploid Grass Carp shipments. However since law enforcement is not a component of the NTGCICP, triploid Grass Carp producers are likely to object to the use of NTGCICP funds to support expenses in support of state law enforcement. States may want to consider seeking a new Congressional authorization for the USFWS (e.g., Fish Technology Centers) to provide ploidy determination and collect fees in support of state law enforcement efforts.

Additional support is needed in the development of reliable field tests to rapidly determine ploidy of inspected Grass Carp. Current techniques require the collection and processing of blood samples at a laboratory and these are not practical for use at random roadside inspections. The USFWS should work with USGS to develop procedures for a reliable ploidy field test in support of NTGCICP QA/QC and state law enforcement activities.

These types of technical assistance would serve to improve the overall effectiveness of the NTGCICP in achieving its stated purpose of providing assurances to states that shipments of certified triploid Grass Carp do not contain diploids. By engaging the states in the NTGCICP (see Recommendation 6) the USFWS could better work with states to determine QA/QC and law enforcement capabilities and needs.

Recommendation 8: Develop and provide information about NTGCICP, regulations, and best management practices for natural resource managers, aquaculturists, and the general public.

Justification:

In order for the recommendations in this report to be followed properly, they must be known by all interests participating in the Grass Carp industry. Certain states interviewed by HDR simply do not know who is producing Grass Carp in their state or the ploidy of the Grass Carp produced. In some cases, the terms diploid and triploid were not understood. Shippers and distributors are required to navigate a maze of varying state regulations and permit requirements. Further, private individuals are often unaware of regulations and rely on suppliers (e.g., distributors, shippers, and producers) to ensure that they are following regulations. Finally, law enforcement officials need to be better informed of Grass Carp regulations.

Numerous recommendations from the National Asian Carp Plan (Conover et al., 2007) also support education and outreach related to Asian carp to increase participation and understanding of the need, benefits, and limitations of the NTGCICP among the public and natural resources management agencies. Further, an improved understanding by consumers will result in increased support and compliance with efforts to prevent unintentional and illegal introductions of diploid and triploid Grass Carp. These recommendations include developing and providing information about the

USFWS NTGCICP, developing educational materials, and providing them to Grass Carp haulers, producers, fish markets, and other appropriate parties in the Grass Carp supply chain.

Considerations:

One potential source for developing such informational materials would be the various Land Grant and Sea Grant extension programs. These programs are experienced in developing education and outreach strategies for agriculture and aquaculture industries. Further, the various extension programs are uniquely positioned to provide an exchange of information, develop education modules, and gather feedback as a third party between industry and regulatory personnel. Land Grant and Sea Grant extension programs are perceived by their clientele as honest brokers of information related to environmental issues.