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
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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 NTGCICIP, 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.

<u>Recommendations</u>:

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.

Introduction

Grass Carp (*Ctenopharyngodon idella*) were introduced to the United States (U.S.) by the U.S. Fish and Wildlife Service's (USFWS) Fish Farm Experiment Station in Stuttgart, Arkansas and Auburn University with the assistance of the United Nations Food and Agricultural Organization in 1963 to evaluate their use as biological control for nuisance aquatic vegetation in public waters and aquaculture (Stevenson, 1965). Both facilities successfully spawned Grass Carp in 1966 (Sills, 1970; Bailey and Boyd, 1972.) and by 1971 fish from the 1966 year class were captured in the Illinois portion of the Mississippi River (Greenfield, 1973). Production and stocking of Grass Carp by state facilities began in Arkansas in 1970 (Bailey and Boyd, 1972) and the first stocking of an open water system occurred in December 1971 (Bailey, 1972.). By 1974, Grass Carp began to appear frequently in the Mississippi River presumably from the open water stocking which occurred in 1971 (Pflieger, 1975), although possibly offspring of the original 1966 year class (Mitchell and Kelly, 2006). Grass Carp also appeared in rivers of Alabama, Florida, Georgia, and Mississippi in the 1970s (Mitchell and Kelly, 2006).

Grass Carp were promoted as a low-cost, non-chemical alternative for pond and lake plant management (Mitchell and Kelly, 2006). Commercial production of Grass Carp in the U.S. began in 1974 and early sale and distribution of diploid Grass Carp was widely un-regulated until 1977 (Appendix 2; Glennon, 2014). The commercial production of 100% ploidy tested triploid Grass Carp began in 1983 (Malone, 1984) and USFWS involvement in the ploidy testing and verification of lots of triploid Grass Carp began in 1985 (Griffin, 1991). The ploidy testing and verification process was developed and initiated by a commercial producer at the request of receiving states which wanted assurances that the lots of triploid Grass Carp being shipped into their state did not contain diploid fish (Glennon, 2014). Between 1985 and 1995 the USFWS involvement in the triploid Grass Carp ploidy verification process was performed as a service to states receiving shipments of triploid Grass Carp (Mitchell and Kelly, 2006). In 1995 USFWS involvement in triploid Grass Carp ploidy inspection and verification process was formalized with the passage of the Triploid Grass Carp Act which authorized the USFWS to collect a reasonable per fish fee to cover the cost of the administration of triploid Grass Carp inspections and certification (Malone, 1996). Other triploid Grass Carp certification processes were developed by regulatory agencies in some areas where the USFWS certification is not used.

The purpose of the USFWS National Triploid Grass Carp Inspection and Certification Program (NTGCICP) is to provide assurances within the confidence level of the program to receiving states that certified lots of triploid Grass Carp do not contain diploid fish. NTGCICP certificates are issued to participating producers for lots of triploid Grass Carp which have met the standards of the program. Most states which permit the import, possession, sale, distribution, or stocking of triploid Grass Carp require shipments of triploid Grass Carp coming into their state to be "Certified by USFWS or another competent authority identified by the state" as an assurance that the shipment does not contain diploid fish (Glennon, 2014). Participation in the NTGCICP is voluntary.

Before a producer may participate in the NTGCICP, the producer must first pass a site inspection and sign a Memorandum of Agreement (MOA) with the USFWS. As a participant in the program the producer must follow the program standards. These standards govern the manner in which Grass Carp

are housed in a producer's facility and require a producer to individually blood test each fish in a lot to identify and remove diploid fish from the lot prior to a program inspection of the 100% farm level tested lot of Grass Carp. In order to receive a ploidy certificate required by a state, each 100% farm level tested lot of Grass Carp must pass a random inspection supervised by a NTGCICP inspector. All of the Grass Carp in a random sample from the 100% farm level tested lot being inspected must be determined to be triploid and the inspector must verify that all of the standards for producers have been met. Once a certificate is issued the certified lot must be shipped within 6 days or the certificate expires and the lot must be re-inspected and another certificate issued.

NTGCICP involvement in triploid inspection and certification ends with the issuance of a Grass Carp Ploidy Release Authorization ("Triploid Certificate") to the participating 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. The NTGCICP charges participating producers a fee per fish certified and also administers a fine structure for non-compliance should a participating producer fail to meet the standards of the program. A producer's participation in the NTGCICP may also be terminated for a history of non-compliance, or for severe infractions regarding the shipment of Grass Carp in violation of state or federal law.

Despite the development of the certified triploid Grass Carp industry and the NTGCICP, feral populations of diploid Grass Carp have spread and become established throughout the Mississippi River Basin, Red, and Trinity rivers in Texas, and the Washita River, Oklahoma (Hargrave and Gido, 2004; Elder and Murphy, 1997; Howells, 1994). Grass Carp have been collected in four Great Lakes (Benson, 2011), and are likely reproducing in at least one tributary to Lake Erie (Chapman et al., 2013). These feral populations are likely the result of escapement during the 1960's; unregulated stocking of diploid grass carp by states and commercial producers in the 1970's; and legal production, distribution, and stocking of diploid Grass Carp allowed by some states within the Mississippi River Basin (Glennon, 2014). Illegal sales and stocking also contribute to the continued introduction of grass carp (State of Michigan, 2012).

Uncertainty about escapes, reproductive capabilities in U.S. rivers, and ecological impacts has changed perception of the use of Grass Carp as a biocontrol agent (Mitchell and Kelly, 2006). Current Grass Carp regulations are fragmented and suffer from the weakest-link problems typical of uncoordinated species regulation (Perrings et al., 2002; Peters and Lodge, 2009). State regulations range from prohibition, to restricted use, to a complete lack of regulations in some areas (Appendix 1). Both diploid and triploid Grass Carp continue to be stocked in private and public water bodies in the U.S.

Concerns over the distribution of feral Asian carp populations in the Mississippi River Basin prompted multiple state and federal agencies, private aquaculture companies, consultants, and nongovernmental organizations to participate in the development 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). The Mississippi Interstate Cooperative Resource Association (MICRA) and the Mississippi River Basin Panel on Aquatic Nuisance Species (MRBP) have identified several recommendations from the National Asian Carp Plan as high priority, and are working to implement these recommendations. One of these recommendations was to evaluate the effectiveness of the

USFWS NTGCICP, and to recommend reasonable actions that would improve the integrity, efficiency, and effectiveness of the program (Recommendation 3.1.6.1 in 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 the regulation, production, triploid certification, shipment, and stocking of Grass Carp was warranted. The USFWS funded MICRA to complete the proposed national analysis addressing the following eight objectives:

Objective 1 [Legal Diploid Introductions]: Gather information on the number and type (public and private) of diploid Grass Carp production facilities in each state, the number of diploid Grass Carp sold or stocked by each facility annually over each of the last 10 years, and when possible the disposition of the fish including: type of sale (private, public, or commercial entity), type of water stocked (pond, lake, reservoir, aquaculture facility, etc.), state fish were shipped to or stocked in, and the stocking location (e.g., name of water body, 6-digit HUC, or latitude and longitude).

Objective 2 [Triploid Production]: Gather, analyze and summarize regulations, Standard Operating Procedures (SOP) or Best Management Practices (BMP) employed at commercial triploid Grass Carp production facilities to contain Grass Carp and prevent diploid contamination of certified lots of triploid Grass Carp.

Objective 3 [Triploid Certification]: Analyze the effectiveness of the National Triploid Grass Carp Inspection and Certification Program at preventing the shipment of diploid Grass Carp.

Objective 4 [Shipping]: Collect and analyze Standard Operating Procedures (SOP) or Best Management Practices (BMP) employed by commercial fish haulers to prevent the contamination of diploid Grass Carp in triploid shipments and to prevent the introduction of diploid or triploid Grass Carp in water bodies where either fish is prohibited.

Objective 5 [Inspection and Enforcement]: Analyze inspection programs, regulations, and enforcement employed by states receiving certified shipments of triploid Grass Carp to ensure that Grass Carp are stocked in accordance with state regulations.

Objective 6 [Regulation]: Compile state rationale, regulations and regulatory implementation regarding triploid or diploid Grass Carp importation, possession, transportation, culture, sale and stocking.

Objective 7 [Potential Contamination]: Identify and analyze sources and pathways in the production, triploid certification, shipping and stocking of Grass Carp not covered in the previous objectives whereby diploid Grass Carp may enter the triploid supply chain.

Objective 8 [Risk Reduction]: Recommend reasonable actions (SOPs or BMPs) and/or regulations, where necessary, for producers, inspection programs, shippers, and states to reduce the risk of unintended introductions of diploid Grass Carp.

This report summarizes the results of the in-depth National Analysis completed by MICRA and HDR Engineering, Inc. (HDR). Appendix 1 provides the full report of the analysis completed by HDR. This report concludes with a discussion of a suite of recommendations proposed by MICRA to reduce the risk of accidental or illegal introduction of diploid or triploid Grass Carp in the U.S.

Methods

Following distribution of a request for proposals developed by the project steering committee organized by MICRA, HDR was subcontracted to conduct an independent, in-depth, national analysis of Grass Carp regulation, production, triploid certification, shipping and stocking. This effort was intended to determine if the public and private entities producing, certifying, shipping, stocking and regulating Grass Carp are employing effective and integrated actions to safeguard aquatic resources by preventing accidental or illegal introduction of diploid or triploid Grass Carp.

HDR coordinated with the MICRA project steering committee to develop a set of standardized questionnaires (Appendix 1) to gather data and information used to complete the desired assessment of the Grass Carp industry. HDR conducted more than 300 telephone interviews with representatives from the USFWS NTGCICIP, state natural resource management agencies, Grass Carp producers, and Grass Carp distributors to obtain comprehensive information. HDR also conducted site visits to Grass Carp facilities (i.e., producers, grow out facilities, and distributors) 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. Site visits and interviews were used to identify potential avenues for unintentional and illegal introductions of diploid and triploid Grass Carp. Following is a general description of the information requested from these interviews:

USFWS NTGCICP:
HDR interviewed representatives of the USFWS NTGCICP and gathered for analysis a summary of their triploid Grass Carp certification records, a list of producers and inspectors in their program, and a copy of the producer standards employed by the program.

States:
HDR compiled and reviewed current Grass Carp regulations for each state. Each state was also asked to provide a rationale for their regulations. State triploid Grass Carp inspection programs, regulations, and the rationale behind the regulation or lack thereof were discussed with state representatives.

Producers and Distributors:

A comprehensive list of diploid and triploid Grass Carp producers and distributors across the nation was compiled. HDR contacted and interviewed each producer, and attempted to contact and interview each distributor at least twice.

The results and recommendations reported by HDR are included in Appendix 1 of this report and are summarized below. The results of the national analysis were limited by the participation, cooperation, and quality of information provided to HDR during and following the interviews. HDR presented their finding and recommendations at a joint meeting of MICRA and MRBP in July 2014. NTGCICP representatives and participating producers were invited to attend the presentation by HDR; and MICRA solicited comments on the HDR report and recommendations from member states and project partners. One reviewer provided extensive comments in the form of a report representing a commercial Grass Carp industry perspective and is included as Appendix 2. MICRA used the HDR report and recommendations, stakeholder comments, and the National Asian Carp Plan to develop the suite of recommendations presented in this report to reduce the risk of unintentional and illegal introductions of diploid and triploid Grass Carp.

Results

Objective 1: *Gather information on the number and type (public and private) of diploid Grass Carp production facilities in each state, the number of diploid Grass Carp sold or stocked by each facility annually over each of the last 10 years, and when possible the disposition of the fish including: type of sale (private, public, or commercial entity), type of water stocked (pond, lake, reservoir, aquaculture facility, etc.), state fish were shipped to or stocked in, and the stocking location (e.g., name of water body, 6-digit HUC, or latitude and longitude).*

The states of Alabama, Mississippi, Arkansas, Missouri, Iowa, and Nebraska allow the legal production of diploid Grass Carp by commercial producers and state facilities. It is legal to transport, sell, and stock diploid Grass Carp in these six states in addition to Hawaii and the eastern half of Colorado. HDR requested information for all public and private facilities within these "diploid" states. In general, the diploid states do not maintain records with the level of detail necessary to address all of the elements of this objective.

Most diploid states maintain a list of Grass Carp suppliers, but do not distinguish between those that produce Grass Carp and those that only distribute fish. HDR identified 114 commercial Grass Carp suppliers within the six diploid states that allow production (Table 1; Appendix 1, Figure 11). With the limited information provided we were unable to determine the number of facilities that actually produce diploid Grass Carp, but believe it to be only a small fraction of the total number of identified suppliers. For example, HDR identified 26 Grass Carp suppliers in Nebraska; however, it was reported to HDR during the state interview that there are four major Grass Carp distributors and no producers in the state. Many of these "suppliers" are simply locations (e.g. Farm/Home Supply Store) where a distributor can hold a one day fish sale to distribute Grass Carp.

Table 1. Number of commercial diploid Grass Carp suppliers (i.e., produce and/or distributor) identified by HDR.

State	Number of commercial Grass Carp suppliers (i.e., producer and/or distributor)
Alabama	16
Arkansas	36
Iowa	12
Mississippi	11
Missouri	13
Nebraska	26
Total	114

Twelve state owned facilities in Alabama, Arkansas, Mississippi, and Missouri were reported to produce or hold Grass Carp; seven of these facilities produce diploid Grass Carp (Arkansas-6, Missouri-1). Three state owned sport fish hatcheries in Alabama reported the purchase of USFWS certified triploid Grass Carp from Arkansas to use on-site and to stock into public fishing lakes. Mississippi has two state owned facilities that produce triploid Grass Carp, but the fish are not tested to remove diploids. In addition to these states that allow the production of diploid Grass Carp, Colorado has three state operated facilities that obtain diploid Grass Carp fry from Arkansas for on-site use.

Most states which allow the stocking of diploid Grass Carp have no reporting requirements, and most commercial producers and distributors were reluctant to provide distribution records due to privacy issues and lack of electronic data availability. In most cases, states only provided stocking records for Grass Carp from state owned facilities; and private stocking records were only provided by three of the eight states that allow stocking of diploid Grass Carp. Consequently, very little data is available concerning the number of legally stocked diploid Grass Carp and we were unable to accurately determine the number of diploid Grass Carp sold or stocked by each facility annually over each of the last 10 years, the disposition of diploid Grass Carp including: type of sale and end use (food fish, stocking, wholesale), type of water stocked (pond, lake, reservoir, aquaculture facility, etc.), state fish were shipped to or stocked in, and the stocking location (e.g., name of water body, 6-digit HUC, or latitude and longitude). Due to the lack of reporting requirements and record keeping, the extent and magnitude of the diploid grass carp market is largely unknown.

Objective 2: *Gather, analyze, and summarize regulations, Standard Operating Procedures (SOP) or Best Management Practices (BMP) employed at commercial triploid Grass Carp production facilities to contain Grass Carp and prevent diploid contamination of certified lots of triploid Grass Carp.*

Commercial triploid Grass Carp producers are regulated by the state in which they operate. Regulations pertaining to Grass Carp were gathered and reviewed for each state by HDR. State regulations regarding Grass Carp are diverse and vary. Due to varying classifications, Grass Carp are regulated by different types of agencies or divisions in each state. Several states have multiple agencies that regulate Grass Carp; e.g., production regulated by Department of Agriculture, and shipping and

stocking regulated by Department of Natural Resources. This creates disconnect between agencies and/or divisions that may have very different missions, and makes it difficult to achieve regulatory consensus or consistency.

There are nine commercial triploid Grass Carp producers located in five different states that participate in the NTGCICP. State regulations which govern the activities at these commercial triploid Grass Carp production facilities to contain Grass Carp and prevent diploid contamination of certified lots of triploid Grass Carp are summarized as follows:

Arkansas

There are four commercial triploid production facilities in the State of Arkansas which participate in the NTGCICP. These four facilities account for over 98% of the certified triploid Grass Carp produced in the U.S. (Glennon 2014). The State of Arkansas permits the production and stocking of diploid Grass Carp and does not have a permit process to regulate possession of Grass Carp by the end user. Commercial fish farms are required to obtain a fish farmer permit in order to propagate and sell fish.

The State of Arkansas prohibits the release of native or non-native species into public waters of the State of Arkansas, or from any state, country, or province without the written permission of the Chief of Fisheries. State regulations also prohibit the use of Grass Carp as bait and prohibit the stocking of Grass Carp into any body of water where ingress of the fish into public waters is not entirely blocked.

Illinois

There are two commercial triploid production facilities in the State of Illinois which participate in the NTGCICP. The State of Illinois prohibits the stocking of diploid Grass Carp and the transportation and stocking of certified triploid Grass Carp is regulated. A Restricted Species Transportation/Stocking Permit is required for each shipment of certified triploid Grass Carp and shipments of triploid Grass Carp must be checked for triploidy by USFWS or by a private lab or company. End users are not required to obtain an additional permit.

Commercial facilities are required to obtain an Aquaculture Facility Permit and can be authorized to possess Grass Carp fingerlings and diploid Grass Carp broodstock for the purposes of producing certified triploid Grass Carp for sale. Grass Carp producers are required to destroy any diploid Grass Carp identified during farm level ploidy testing. The State of Illinois prohibits the release of triploid Grass Carp into any natural body of water, including glacial lakes; slough potholes; bottom land or backwater lakes; streams; rivers; water areas know to harbor rare, threatened, or endangered animals or plants on the official National or Illinois State list; any State Inventory Natural Area; any State Nature Preserve; or wetland.

Alabama

There is one commercial triploid production facility in the State of Alabama which participates in the NTGCICP. The State of Alabama permits the production and stocking of diploid Grass Carp, does not regulate Grass Carp transportation or stocking, and does not have a permit process to regulate possession of Grass Carp by the end user. Commercial fish farms are required to obtain a Sale of Pond Raised Gamefish Permit in order to propagate and sell fish. The State of Alabama prohibits the stocking of public waters without written permission from the state.

Georgia

There is one commercial triploid production facility in the State of Georgia which participates in the NTGCICP. The State of Georgia prohibits the production and stocking of diploid Grass Carp, requires certification of triploid Grass Carp shipments, and the transportation and stocking of certified triploid Grass Carp is regulated. End users are not required to obtain a permit.

Commercial fish farms are required to obtain an Aquaculture Registration and a wild animal license for dealing/breeding regulated fish in order to propagate and sell Grass Carp. Licensed Grass Carp producers are permitted to possess diploid Grass Carp over 5 pounds for use as broodstock in accordance with an approved SOP to prevent escape of diploid fish from the facility. Any diploid Grass Carp less than 8 inches and 5 pounds identified during farm level ploidy testing are to be destroyed. The conditions of the permit require the holder to allow Department of Natural Resources agents access to the subject facilities at reasonable times to take blood samples of any Grass Carp in his/her possession for the purposes of determining if the fish are triploid and otherwise check for compliance with applicable laws, regulations, and provisions of the license. A signed bill of sale must be given to each buyer at the time of sale which has the date, number of Grass Carp purchased, and a certification that each Grass Carp is triploid. Records required by the Game and Fish Code and the license must provide a clear audit trail which accounts for each fish from the time it comes into the possession of the licensee through its legal disposition or death. The licensee must notify the Special Permit Unit at least 1 day in advance of selling Grass Carp and must maintain copies of bills of sale, certificates of triploidy, and other records required for a period of 12 months.

South Carolina

There is one commercial triploid production facility in the State of South Carolina which participates in the NTGCICP. The State of South Carolina prohibits the stocking of diploid Grass Carp and the transportation and stocking of triploid Grass Carp is regulated. A Possession of Non-Indigenous Species Permit and a Transportation Authorization is required to transport producer tested triploid Grass Carp and shipments of triploid Grass Carp must be checked for triploidy by the State of South Carolina prior to stocking. The State of South Carolina charges a ploidy inspection fee of $1.00 per fish shipped to inspect producer certified triploid Grass Carp shipments.

Commercial producers also are required to obtain a commercial aquaculture permit and a site specific permit, operate under SOP's from the state regarding containment of diploid fish, and must pass inspection by the state. Permitted producers may possess mixed ploidy populations of Grass Carp fingerlings and diploid Grass Carp broodfish for the production of triploid populations. Intrastate shipments of triploid Grass Carp may be certified by the producer and are inspected by the state prior to sale. Producers are required to issue stocking permits to end users and must submit monthly and quarterly reports of triploid Grass Carp stockings. The State of South Carolina prohibits the stocking of non-indigenous fish into public waters without permission from the state.

There are three commercial triploid Grass Carp producers located in two states that do not participate in the NTGCICP. These three producers do not sell USFWS certified triploid Grass Carp and therefore regulations only contribute to the containment of diploid Grass Carp and are not applicable to preventing diploid contamination of certified triploid Grass Carp. State regulations which govern the activities at these three commercial triploid Grass Carp production facilities to contain Grass Carp are summarized as follows:

Florida

There are two commercial triploid production facilities in the State of Florida. The State of Florida prohibits the stocking of diploid Grass Carp and the transportation and stocking of certified triploid Grass Carp is regulated. Commercial producers are required to obtain a hatchery permit, a holding and possession permit, operate under SOP's from the state regarding containment of diploid fish, and must pass inspection by the state. Permitted producers may possess mixed ploidy populations of Grass Carp fingerlings and diploid Grass Carp broodfish for the production of triploid populations. Intrastate shipments of triploid Grass Carp may be certified by the producer. End users are required to obtain a stocking permit and producers must submit monthly reports of triploid Grass Carp stockings.

Missouri

There is one commercial triploid production facility in the State of Missouri. This facility produces diploid Grass Carp and uncertified triploid fry and fingerlings for sale to other producers. The State of Missouri permits the production and stocking of diploid Grass Carp and does not have a permit process to regulate possession of Grass Carp by the end user. Commercial fish farms are not required to obtain a fish farmer permit in order to propagate and sell fish.

HDR asked state representatives about SOPs and BMPs utilized by producers and distributors that sell or ship Grass Carp to: prevent the contamination of diploid Grass Carp in triploid shipments and to prevent the introduction of diploid or triploid Grass Carp in water bodies where either is prohibited. On a national level, there is a lack of written protocols in use and plans that do exist were not readily available. Diploid states do not have state level SOPs and BMPs to separate diploid Grass Carp since these states do not classify diploids as a prohibited species. Based on interview responses, only seven

triploid states have some type of SOP, BMP, or Hazard Analysis and Critical Control Point (HACCP) plan recommendation or requirement. These may be in the form of permit requirements for site facilities and operations or a guideline that facilities must develop SOPs, BMPs, or a HACCP plan. One state provides HACCP plans for aquaculture facilities but is not sure if the facilities abide by them. Another state has strict site requirements and higher permit fees if facilities don't abide by their guidelines. Upon request of examples, most of the states indicated that Grass Carp facilities should be contacted directly in order to get a copy of SOPs, BMPs, or HACCP plans due to proprietary issues or the fact that they don't have a copy readily available. No centralized collection of plans was noted by the states, unless they were in the form of permit requirements.

Triploid Grass Carp producers that choose to participate in the NTGCICP must sign an MOA with the USFWS. The NTGCICP has SOPs and BMPs outlined for both inspectors and producers through published USFWS Standards (Appendix 1 - E). In addition, there are several checklists provided on the NTGCICP website to help standardize operations (Appendix 1 – F). Part of the MOA requires that each facility have a written protocol to follow in the event that a suspected diploid fish is detected. Inspectors keep these protocols for reference during an inspection. Moreover, individual Quality Assurance and Quality Control (QA/QC) plans are customized and implemented for each facility depending on their equipment and operational protocols. Inspection data are retained on NTGCICP datasheets. Since implementation of the MOA process, a formal worksheet has been developed to standardize collection of QA/QC data for each inspection, and an inspector's log is maintained for QA/QC of equipment and on-site conditions. Inspector records help provide assurances that an external variable (power fluctuation, water conditions, reagent shelf-life, etc.) does not impede test accuracy and impact results.

Seventeen of the 30 producers and distributors interviewed indicated that they have SOPs or BMPs in place to contain and prevent diploid contamination during both production and hauling, but most don't have written documentation. HDR found that SOPs are generally communicated verbally to staff since Grass Carp facilities are often small, family-owned businesses with very few employees. In fact, only one producer (J.M. Malone and Son, Inc.) provided written SOPs for certified triploid Grass Carp production (Appendix 1 - E). Verbal SOPs cover a wide range of topics from screening facility outflows in accordance with state regulations, broodstock management, hatchery procedures to prevent the escape of eggs or fry, farm level ploidy testing, oversight for loading fish onto delivery trucks, removing untested Grass Carp from other species of fish, checking permits prior to stocking, and general administrative actions to meet the record keeping requirements of the states. HDR concluded that without written and frequently reviewed SOPs and BMPs it is possible to introduce diploid Grass Carp either by distribution/stocking or facility escapement (particularly if there is turnover in employees).

Objective 3: *Analyze the effectiveness of the National Triploid Grass Carp Inspection and Certification Program at preventing the shipment of diploid Grass Carp (in shipments of triploid Grass Carp).*

The USFWS initiated Grass Carp ploidy inspection and verification in 1985 to provide assurances to states "that shipments of Grass Carp alleged to be all triploid, do not, within the confidence limits of the inspection program, contain diploids" (USFWS, 2014). The USFWS was authorized by Congress in

1995 (S.268) to “charge reasonable fees for expenses to the federal Government for triploid Grass Carp certification inspections requested by a person who owns or operates an aquaculture facility." The inspection and certification process is governed by standards that outline requirements for USFWS inspectors and private producers. The NTGCICP includes four critical elements:

(1) Standards for USFWS Inspectors

(2) Standards for Grass Carp Producers

(3) Standards for Collection and Fees

(4) Standard Fees and Penalties Program

The standards are reviewed annually at a meeting between triploid Grass Carp producers and USFWS inspectors, and revised if necessary. In order for private producers to be part of the NTGCICP, the producer must sign a MOA with USFWS which outlines the requirements and potential penalties associated with noncompliance.

Over the last ten years, the NTGCICP conducted 2,812 inspections and prevented 33 lots of Grass Carp which did not meet the standards of the program from entering the certified triploid Grass Carp supply chain. During that time, the NTGCICP issued ploidy certificates for 13,727 shipments totaling 4,960,413 certified triploid Grass Carp shipped.

Beginning August 1, 2010, new standards were adopted by the NTGCICP to improve quality control during 100% farm level testing by participating producers. Participating producers report improvements to their triploid induction procedures to minimize the number of diploid Grass Carp entering the testing facility, reducing failed inspections and subsequent non-compliance fees. Participating producers report populations of Grass Carp on their farms prior to 100% farm level testing currently contain less than 1% diploid Grass Carp (99% triploid prior to 100% farm level testing).

In a preliminary investigation of the detection limits of the NTGCICP sample size, Glennon and Kelly (2012) determined that untested populations containing only 99% triploids would fail 60% of inspections if they were not 100% farm level tested prior to inspection. Since August 1, 2010, only 0.64% of Grass Carp lots inspected have failed NTGCICP inspections, indicating that participating producers are meeting the standards of the NTGCICP with regard to 100% farm level testing. Inspection failure rates are believed to indicate the frequency of human error during 100% farm level testing to remove diploid fish, and do not provide an incidence rate of diploid Grass Carp in certified lots of triploid Grass Carp.

The effectiveness of the NTGCICP in preventing the shipment of diploid Grass Carp in shipments of triploid Grass Carp is difficult to report statistically. The best measure of the effectiveness of the NTGCICP at preventing the shipment of diploid Grass Carp in lots of certified triploid Grass Carp may be the results of random sampling by receiving states from shipments of certified triploid Grass Carp. However, such sampling is rarely conducted and results are not reported to the NTGCICP. The only data available regarding diploid Grass Carp within the NTGCICP is the number or percentage of 100% farm level tested lots from which a diploid fish was identified during the inspection process. This failure rate

can be misinterpreted as being the percentage of certified lots which contain diploids or the percentage of fish in a certified lot that are diploid. Neither interpretation is correct because a 100% farm level tested lot of Grass Carp from which a single diploid has been identified during inspection does not receive certification and cannot be shipped as a USFWS certified triploid Grass Carp shipment.

Implementation of producer standards were observed by HDR during site visits with producers in the NTGCICP. HDR concluded that the NTGCICP is effective in preventing diploid Grass Carp from leaving a participating producer's facility as alleged triploid Grass Carp. However, HDR noted that the QA/QC provided by the NTGCICP ends once a lot of certified triploid Grass Carp leaves the control of the participating producer. When considering the industry as a whole and given the facts that the scope of the NTGCICP does not include enforcement of regulations, a general lack of random inspections and enforcement of regulations by receiving states, the majority of Grass Carp facilities identified are distributors that are not subject to any NTGCICP standards, and diploid Grass Carp can be shipped and stocked in eight states, the confidence provided by the high degree of QA/QC in the NTGCICP is jeopardized. Modifying the scope of the NTGCICP to engage both states and Grass Carp distributors is warranted to accomplish the USFWS stated objective of providing assurances to states that shipments of certified triploid Grass Carp do not (within the confidence level of the program) contain diploids.

Objective 4: *Collect and analyze SOPs and BMPs employed by commercial fish haulers to prevent the contamination of diploid Grass Carp in triploid shipments and to prevent the introduction of diploid or triploid Grass Carp in water bodies where either fish is prohibited.*

HDR identified 393 producers, grow-out facilities, and/or distributors of Grass Carp in the U.S. and was able to interview 286 (73%) of these businesses; 65 have gone out of business, and 37 are strictly locations where one-day fish sales are held (e.g. Farm/Home Supply Store). Of the remaining 184 businesses interviewed by HDR, 177 (96%) were either a distributor only (n=144) or a producer/grow-out facility that also distributes Grass Carp (n=29); only seven producers reported that they do not distribute fish. Forty-four (25%) of all distributors reported that they distribute both in-state and out-of-state. HDR reported that 93 distributors (53%) transport USFWS certified triploid Grass Carp and 20 distributors (11%) transport more than one type of Grass Carp (i.e., diploid, uncertified triploid, or USFWS certified triploid).

Few commercial fish haulers have a written SOP or BMP to prevent contamination of diploid fish in triploid shipments unless it is part of a written permit provided by the state. No examples of a written SOP were provided to HDR. Commercial fish haulers operate their facilities and trucks with verbal SOPs or BMPs which are taught to employees during training. The activities of commercial fish haulers are regulated by the receiving state, including any SOP or BMP requirements related to preventing the contamination of diploid Grass Carp in triploid shipments. Preventing the introduction of diploid or triploid Grass Carp in water bodies where they are prohibited would depend on the regulations of the receiving state. HDR concluded that without written and frequently reviewed SOPs and BMPs there is the possibility for introductions of diploid Grass Carp either by distribution/stocking or facility escapement (particularly if there is turnover in employees).

In general, SOPs and BMPs to prevent contamination of diploid Grass Carp in triploid shipments are described as:

Trucks hauling both triploid and diploid fish isolate each into separate tanks on different sides or ends of the truck. Shipments containing both diploid and triploid Grass Carp are rare. Loading diagrams for each shipment will indicate which tanks contains which fish and copies of the loading diagrams are maintained by the driver. Commercial haulers operating multiple trucks in multiple states usually only haul one type of Grass Carp on each truck.

Most shipments involve unloading all of the fish in the shipment prior to returning home. In the event the truck returns home with Grass Carp, the fish are unloaded into a holding facility or returned to the producer for credit before loading another shipment of fish.

In the event a Grass Carp is detected which is inadvertently mixed with another species of fish loaded onto a truck containing a separate tank of certified triploid Grass Carp, the Grass Carp found in the mixed tank are picked out and destroyed.

SOPs and BMPs to prevent introduction of diploid or triploid Grass Carp in water bodies where they are prohibited are generally described as:

Commercial haulers which are contracted by a participating producer are given instructions and contact information for the individual the producer has arranged to meet them at the stocking location. All necessary permit requirements or stocking arrangements are coordinated by the producer prior to shipment. The contact individual for the stocking (Agency or Private) is responsible for showing the commercial hauler where to stock the fish.

Commercial haulers which are not contracted by a participating producer are responsible for making sure the Grass Carp they are stocking are not being introduced into a water body where they are prohibited. The method for doing so will vary with the receiving state and the condition of their permit/license from the state. For example: The State of Indiana requires that the seller/shipper physically stocks the Grass Carp into the pond of a customer purchasing the fish and therefore can check and record the address of the pond. The State of Illinois does not require the seller/shipper to physically stock the Grass Carp into the pond of the customer purchasing the fish and most seller/shippers package the fish into plastic bags for the customer to take home from an advertised store or Soil and Water Conservation District office. In Illinois the commercial hauler has to trust the information provided by the customer regarding the location of their pond.

Objective 5: *Analyze inspection programs, regulations, and enforcement employed by states receiving certified shipments of triploid Grass Carp to ensure that Grass Carp are stocked in accordance with state regulations.*

Inspection programs

Representatives from each state were asked questions regarding their inspection and enforcement protocols. Inspection protocols for Grass Carp shipments range from no inspections to inspecting every shipment. Thirty-seven states reported that they have **no** inspection requirements for Grass Carp shipments, and only 13 states require field inspections of a Grass Carp shipment en route. Most inspections are for verification of required paperwork and consist of checking permits, labeling, and proof of certification. Only in rare cases is ploidy testing conducted.

Florida and Illinois conduct scheduled inspections of certified triploid Grass Carp shipments whereby the producer and distributor is notified prior to shipping that their shipment will be inspected at a pre-determined time and place. Illinois regulations specify tolerances for diploids in a shipment - "All shipments of triploid Grass Carp are subject to further ploidy testing on a random basis by the State of Illinois determined at the time of permit issuance. If no more than one diploid is found in a shipment, the diploid will be destroyed and another sample will be taken. If no more diploids are found the shipment is allowed to continue. If more than one diploid is found in a shipment, the Conservation Police Officer may confiscate the vehicle transporting the fish, destroy the fish, seek revocation of the fish dealer's license, and the violator will be subject to the Lacey Act" (Glennon, 2014).

Florida, Georgia, Indiana, Kentucky, Louisiana, New Mexico, New York, Ohio, Oklahoma, Texas, Virginia, and Wyoming conduct random inspections of certified triploid Grass Carp shipments whereby the producer and distributor is not notified that their shipment will be inspected. HDR reports that random inspections are more beneficial than scheduled inspections because a distributor may have time to prepare for a scheduled inspection, but a random inspection is a more accurate indication of their typical operations.

Arizona, California, Connecticut, Delaware, Idaho, Nevada, New Jersey, North Carolina, Oregon, Pennsylvania, South Dakota, Washington, and West Virginia do not conduct any type of inspection for certified triploid Grass Carp shipments.

Regulations

Grass Carp are governed by diverse state regulations throughout the U.S. with very little inter-jurisdictional coordination. Within the Mississippi River Basin it is legal to produce, transport, sell, and stock diploid Grass Carp, non-certified triploid Grass Carp, and certified triploid Grass Carp. Several states currently stock diploid Grass Carp into state waters while surrounding states prohibit all Grass Carp or permit only the possession and sale of USFWS certified triploid Grass Carp. Some states require a Grass Carp permit to be obtained by the end user prior to stocking triploid Grass Carp. A general characterization of pertinent regulations follows.

Certification

All 27 states that require certified triploid Grass Carp require a permit of some kind to possess, transport, stock, or sell certified triploid Grass Carp. Sixteen states (Connecticut, Florida, Georgia, Idaho, Indiana, Kentucky, New Jersey, New York, Oklahoma, Oregon,

Pennsylvania, Texas, Virginia, Washington, West Virginia, and Wyoming) require producers and distributors to have certification from USFWS NTGCICP for certified triploid Grass Carp shipments. Eleven states (Arizona, California, Connecticut, Delaware, Illinois, Louisiana, Nevada, New Mexico, North Carolina, Ohio, and South Dakota) require producers and distributors to have certification from either the USFWS NTGCICP or from a public or private lab for certified triploid Grass Carp shipments. Florida does not require USFWS certification for intrastate shipments, and Georgia does not require USFWS certification for shipments from Florida or Alabama (Glennon, 2014). Louisiana must approve any lab other than the USFWS NTGCICP which is to certify triploid Grass Carp before a certification can occur.

SOPs/BMPs

Six states (Florida, Illinois, North Carolina, Oklahoma, Oregon, and Texas) require producers and distributors to operate under written SOPs or BMPs regarding certified triploid Grass Carp shipments. Despite this requirement, HDR was only provided with a single copy of a written SOP from a producer, and no SOPs were provided for distributor operations.

End user/Stocking/Possession permit

The States of Arizona, California, Connecticut, Delaware, Florida, Idaho, Louisiana, Nevada, New Jersey, New Mexico, Oregon, Pennsylvania, South Dakota, Texas, Virginia, Washington, and Wyoming require the end user to obtain a permit to stock or possess certified triploid Grass Carp.

Some states inspect the stocking site prior to issuing a stocking permit. Some states require screening of effluents/overflows prior to issuing a stocking permit.

Importation Permit/Notification prior to importation

The States of Connecticut, Georgia, Idaho, Illinois, Nevada, New Mexico, South Dakota, Texas, and Virginia require an importation permit or notification prior to shipment of certified triploid Grass Carp.

Producer /Distributor/Sales permit

The States of Arizona, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Kentucky, Louisiana, North Carolina, Ohio, Oklahoma, Pennsylvania, South Dakota, Texas, and West Virginia require producers, shippers, or distributors to obtain a sales, transport, or possession permit for certified triploid Grass Carp.

Record Keeping/Reporting

Florida, Georgia, Illinois, Indiana, Kentucky, Louisiana, Ohio, Pennsylvania, and Texas require producers and distributors to retain records of certified triploid Grass Carp shipments.

Florida, Illinois, Indiana, Kentucky, Louisiana, and Ohio also require producers and distributors to report certified triploid Grass Carp shipments.

Enforcement

More than half of the states reported to HDR that they do not have defined enforcement protocols for illegal acts of Grass Carp introduction. Three states reported randomly sampling fish in a shipment for ploidy determination. Nine of the 27 states (33% - California, Florida, Georgia, Illinois, Indiana, Kentucky, Louisiana, New Mexico, and New York) which require certification of triploid Grass Carp shipments report enforcement of shipment regulations. A common theme reported to HDR is that states do not have adequate resources to provide necessary law enforcement.

HDR reports that the Interstate Commerce Commission protects distributors from enforcement action when transporting Grass Carp across state lines and through states that have classified Grass Carp as illegal, provided that shipment does not stop and distribute the fish within that state. The lack of regulatory consistency – along with an overall lack of inspection and enforcement – creates an environment for potential abuse and leaves all states vulnerable to unintentional and illegal introductions of Grass Carp.

Objective 6: *Compile state rationale, regulations and regulatory implementation regarding triploid or diploid Grass Carp importation, possession, transportation, culture, sale and stocking.*

State regulations regarding the use of Grass Carp are varied, inconsistent, and even contradictory. Based on 2013 regulations, HDR reported that 30.5 states (61%) allow triploid Grass Carp stockings, 7.5 states (15%) allow diploid stockings and 12 states (24%) prohibit Grass Carp.

States that require triploid Grass Carp:

1) Arizona
2) California
3) Colorado – west of Continental Divide
4) Connecticut
5) Delaware
6) Florida
7) Georgia
8) Idaho
9) Illinois
10) Indiana
11) Kansas
12) Kentucky
13) Louisiana
14) Nevada
15) New Jersey
16) New Mexico

17) New York
18) North Carolina
19) Ohio
20) Oklahoma
21) Oregon
22) Pennsylvania
23) South Carolina
24) South Dakota
25) Tennessee
26) Texas
27) Utah
28) Virginia
29) Washington
30) West Virginia
31) Wyoming

States that allow diploid Grass Carp:

1) Alabama
2) Arkansas
3) Colorado – only east of Continental Divide
4) Hawaii
5) Iowa
6) Mississippi
7) Missouri
8) Nebraska

States that prohibit Grass Carp:

1) Alaska
2) Maine
3) Maryland
4) Massachusetts
5) Michigan
6) Minnesota
7) Montana
8) New Hampshire
9) North Dakota
10) Rhode Island
11) Vermont
12) Wisconsin

Colorado is counted as half diploid and half triploid because diploids are allowed in the eastern half the state, but only triploids are permitted to the west of the Continental Divide as that portion of the state is within the Colorado and Rio Grande river basin. All states that require triploid Grass Carp require triploid certification with the exceptions of Kansas and Tennessee. South Carolina requires triploid Grass Carp, and all shipments are tested and certified by the state upon entry for a $1.00 per fish fee.

Some states interviewed by HDR were not fully knowledgeable about the Grass Carp industry within their state. In more than one case, interview responses from state agency representatives were conflicting on whether or not triploids were required. Multiple diploid states have made an attempt or have a desire to prohibit diploid Grass Carp but have been unsuccessful in overcoming resistance to regulation changes including: resistance from the private industry, cost of equipment and certification, lack of regulations in surrounding states, difficulty approving new regulations, perceived need for revised regulations, and enforcement.

Many states lack the budgets and personnel to inspect shipments, issue permits, or conduct site visits. Most triploid Grass Carp regulations are implemented with permits for producers or sellers; some of which require producers and sellers to obtain stocking permits, maintain records of Grass Carp stockings, or notify the State of shipments prior to importation.

Rationales reported to HDR for the widely varying regulations on Grass Carp among states are summarized below.

Rationale reported to HDR by states that prohibit Grass Carp:

- Grass Carp were determined to be more detrimental that beneficial
- Grass Carp did not prefer the vegetation which needed to be controlled
- Climate was not conducive for beneficial weed control
- Interspecific competition for food with invertebrates and other fishes
- Desire to minimize changes to the composition of native and healthy macrophyte, phytoplankton and invertebrate communities
- Grass Carp waste was thought to cause spikes in algae or nonpreferred plankton
- There are plenty of approved chemicals for aquatic macrophyte control
- Desire not to use nonnative species to control native plants
- Regulations were formed before the triploid production process was perfected
- Grass Carp were considered detrimental to restoration efforts of native grasses
- Desire to prevent impacts to native recreational and commercial fish species
- Existing waters are relatively disease free with few invasive species
- Concerns over escape into, stocking of or transfer to public waters
- First-hand accounts of issues encountered with Grass Carp
- Grass Carp thought to interfere with reproduction of other fishes
- Grass Carp thought to decrease refugia and habitat for other fishes
- Grass Carp may carry parasites and disease potentially transmissible to native fishes

- Consider paperwork to track ploidy and efforts to control Grass Carp too problematic when triploids were allowed

Rationale reported to HDR by states that require Triploid Grass Carp:

- Recognize the need for vegetation control
- Only allow Grass Carp for vegetation control in closed systems
- Triploids are considered less expensive than chemicals for vegetation control and there is little risk of reproduction
- Triploids are sterile and will not cost money to control
- Allowing triploids will prevent damage to habitat from reproducing Grass Carp
- Triploids are an inexpensive form of weed control
- Requiring triploids protects native species
- Prohibiting all Grass Carp would encourage diploid Grass Carp to be brought in illegally.
- USFWS requires that no diploids are stocked to preserve the native species and threatened and endangered species in a particular area

Rationale reported to HDR by states that allow diploid Grass Carp:

- Diploids have been present for a long time without posing problems in State
- Usefulness for nuisance vegetation control far outweighs detriments
- Feral Grass Carp populations provide revenue for commercial fisherman
- Provide source of food
- Diploid Grass Carp are cheaper than triploids
- Costs to change the regulation to triploids would be high
- State tried to prohibit diploids but private industry objected
- Habitat not conducive to natural reproduction
- Reduces herbicide use and are more effective than herbicides
- Grass Carp increase access for use of shoreline by reducing vegetation
- Stocking occurs in impoundments which do not allow Grass Carp to reproduce
- Requiring triploids would impact the availability of obtaining fry rather than fingerlings
- State could not convince surrounding States to change to triploids as could not justify changing if surrounding States did not
- The State used triploids for years and didn't feel there was less impact on the environment
- The majority of feral populations of Asian carp are other species
- State biologists do not have issue with diploids

Objective 7: *Identify and analyze sources and pathways in the production, triploid certification, shipping and stocking of Grass Carp not covered in the previous objectives whereby diploid Grass Carp may enter the triploid supply chain.*

The interviews conducted by HDR with USFWS representatives, state agency representatives, Grass Carp producers, and Grass Carp distributors revealed potential avenues for illegal or accidental

introductions. In addition, HDR conducted a total of 12 site visits at Grass Carp facilities – including producer, grow-out, and distributor facilities – in seven states (Alabama, Arkansas, Illinois, Indiana, Kentucky, Mississippi, and Missouri) to observe and discuss standard operations. Through interviews and site visits, HDR documented actual and perceived pathways of diploid Grass Carp introduction into the triploid Grass Carp supply chain. A brief summary of the identified sources and pathways are presented below. See Appendix 1 (Sections 4.1.6, 4.2.8, 4.3.6, and 5.5) and Appendix 2 (Section 8) for a detailed presentation of HDR's findings and an analysis provide by J.M. Malone and Son, Inc., respectively.

The NTGCICP is not intended to identify illegal acts; however, the NTGCICP has identified potential avenues for illegal or accidental introductions of diploid Grass Carp such as:

- Producers who have had a track record of legal problems.
- Fish hauling operations that move Grass Carp and other fish into several states; and which may add fish to the shipment as they move from site to site.
- Locations where Grass Carp are being advertised for sale along the border of states that have differing regulations.

HDR reports that 14 of the 41.5 states (32%) that do not allow diploids have had one or more known introductions of diploid Grass Carp. Law enforcement agents and state biologists have reported actual cases of diploid Grass Carp in states where transportation permits are required and only triploid Grass Carp are allowed. Vectors for diploid Grass Carp entering these states were reported as golf courses stocking diploids, diploids in a triploid shipment, live diploids in the food market, stockings not matching with permits, diploids already present in the wild, and supplier or driver trying to make money by selling diploid Grass Carp as triploid Grass Carp.

Glennon (2014) states that the greatest likelihood that a diploid would end up in the triploid Grass Carp supply chain would occur through the shipping activities of a rogue shipper/distributor or through the production activities of a non-NTGCICP participating commercial producer operating in a state that does not require USFWS certification, and does not require or provide oversight or SOPs/BMPs regarding farm level testing. The greatest threat to the triploid Grass Carp supply chain may be rogue shippers/distributors that willfully violate state law with regard to the possession and sale of triploid Grass Carp. The next greatest threat to the triploid supply chain would be distributors which possess both triploid and diploid Grass Carp on the same truck or shared facility without appropriate safeguards to prevent contamination. HDR found that 16 of 20 distributors (80%) interviewed ship both diploid and triploid Grass Carp; it is unclear from the information provided to HDR how many of these distributors ship both diploid and triploid Grass Carp on the same truck.

The most problematic sources and causes for the unintentional and illegal introduction of diploid Grass Carp in the triploid Grass Carp supply chain can be summarized as conflicting state regulations, the availability of diploid Grass Carp in the commercial supply chain, and third party distributors that transport certified triploid Grass Carp and uncertified triploid and/or diploid Grass Carp.

Objective 8: *Recommend reasonable actions (SOPs or BMPs) and/or regulations, where necessary, for producers, inspection programs, shippers and states to reduce the risk of unintended introductions of diploid Grass Carp.*

HDR concludes that the National Analysis documented inconsistencies across the nation in regard to Grass Carp policies, and the greatest need is to implement a National Policy Strategy for triploid Grass Carp. To do so will require all states to adopt consistent and complimentary regulations that either prohibit Grass Carp entirely or restrict Grass Carp use to certified triploid Grass Carp only. The NTGCICP should be a primary component of a national policy strategy whereby all states adhere to a minimum of standard regulations, record keeping, and requirements for written BMPs and SOPS. HDR provides a suite of recommendations regarding state regulations, inspection and enforcement, record keeping, education and awareness, and the NTGCICP (Appendix 1, Section 6). HDR also provides example BMPs for certified triploid Grass Carp producers (Appendix 1 - E). 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.

Following a review of the HDR report and recommendations, J.M. Malone and Son, Inc. provided comments in the form of an industry perspective of the 'National Analysis of Grass Carp Regulation, Production, Triploid Certification, Shipping, and Stocking' (Glennon, 2014). The report contains a suite of recommendations for triploid Grass Carp producers, NTGCICP, states, and shippers/distributors (Appendix 2, Section 10). The majority of recommendations contained within this industry perspective concern changes to current state regulations, state inspection programs, and enforcement of state regulations.

MICRA considered the HDR findings and recommendations, and comments on the HDR report received from state, NTGCICP, and Grass Carp industry representatives - including the report provided by J.M. Malone and Son, Inc. - to develop the following set of minimum recommendations to reduce the risk of unintentional and illegal introductions of diploid and triploid Grass Carp where prohibited in the U.S.:

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).

4. Increase random inspections and enforcement of relevant regulations in states that allow the importation of certified triploid Grass Carp.

5. Improve the standards and regulation of the live Grass Carp shipping industry.

6. Modify the scope of the USFWS National Triploid Grass Carp Inspection and Certification Program (NTGCICP), including direct participation of states and 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, regulations, and best management practices for natural resource managers, aquaculturists, and the general public.

Justifications and considerations for each of the above recommendation are discussed in detail in the following section.

Discussion

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. A growing controversy in the 1970s regarding the ability of Grass Carp to reproduce in river systems in the U.S. resulted in many states banning the importation of Grass Carp. The availability of triploid Grass Carp in the 1980s further complicated management and regulation of Grass Carp in the U.S. 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 nation are attempting to prevent from establishing self-sustaining populations within or along their borders.

There are currently seven states in the continental U.S. that allow stocking of diploid Grass Carp to control nuisance aquatic vegetation (Alabama, Arkansas, Colorado, Iowa, Mississippi, Missouri, and Nebraska). Each of these diploid states border at least two other states that either prohibit all Grass Carp or restrict their use to triploid Grass Carp only. Such inconsistent policies and the continued availability of diploid Grass Carp exacerbates undesirable environmental consequences; directly conflicts with efforts of other states to prevent and control feral populations; makes enforcement of existing Grass Carp regulations arduous; and likely confuses the public, policy and decision makers. This reduces the credibility of management agencies and their overall effectiveness at increasing public involvement to prevent the introduction and spread of AIS (Peters and Lodge, 2009).

Peters and Lodge, (2009) state that “policy is used to prevent the introduction and spread of invasive species. For AIS that can easily cross political boundaries, regional policies are needed. A weak

link problem occurs when regulations of individual jurisdictions increase the region-wide risk of species introductions, especially in adjacent jurisdictions." As discussed by HDR in Appendix 1, the mosaic of state Grass Carp regulations has been ineffective at preventing unintentional and illegal introductions of Grass Carp, and a national policy strategy is needed. After a thorough literature review, Dibble and Kovalenko, (2009) concluded it was necessary to prohibit continued stocking of diploid Grass Carp. The authors state that the importance of changing regulations in states that still allow possession and stocking of diploids cannot be overemphasized. For this reason, a more conservative approach should be used when developing guidelines for a comprehensive national policy strategy for Grass Carp use (Dibble and Kovalenko, 2009). By prohibiting diploid Grass Carp release in all – rather than some – U.S. states (and Ontario), the abundance and subsequent movement of diploid Grass Carp to unintended or unwanted locations within the Great Lakes basin would likely be reduced (Wittmann et al., 2014).

The most important part of a national policy strategy is consistent regulations to remove diploid Grass Carp from the commercial supply chain. The National Asian Carp Plan (Conover et al., 2007) was approved by the federal Aquatic Nuisance Species Task Force in November 2007. As explained in the National Asian Carp Plan, "consistent regulations requiring shipment and stocking of certified triploid Grass Carp only, combined with state enforcement, could eliminate most of the sources of fraudulent sales… In the absence of markets for diploid fish, the majority of distributors, wholesalers, and retailers will not have a need to possess, or be tempted to fraudulently sell diploid Grass Carp."

Similar to recommendations in the National Asian Carp Plan, HDR concluded that a national policy strategy is required where all states either prohibit all Grass Carp, or prohibit diploid Grass Carp and only authorize commercial production and use of certified triploid Grass Carp. This will effectively minimize risks of unintentional and illegal introductions of diploid Grass Carp. HDR states that an Injurious Wildlife Listing under the Lacey Act may be necessary to accomplish regulatory consistency. However, an Injurious Wildlife Listing would create considerable problems for the continued commercial production, shipment, and sale of triploid Grass Carp. Similar results could be accomplished – without the undesired complications from the Federal Lacey Act – if all states were to adopt the recommended consistent national policy strategy.

Twelve states completely prohibit all Grass Carp. While this is the most effective means of ensuring unintentional and illegal introductions of diploid Grass Carp, it is not possible for all states to adopt similar prohibitions. Therefore, following are recommendations for a consistent national policy strategy for Grass Carp that will greatly reduce the risk of unintentional and illegal introductions of diploid Grass Carp in the Mississippi River Basin, Great Lakes Basin, and the rest of the nation. The first five recommendations address state regulatory needs to provide the consistent national policy strategy recommended by HDR and the National Asian Carp Plan. Two recommendations are provided for the USFWS to improve the efficacy of the NTGCICP. A final recommendation addresses information and outreach needs for both state agencies and the USFWS to increase awareness and compliance with Grass Carp regulations by producers, distributors, 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 shipment**s**." 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.

<u>Considerations:</u>

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 NTGICP and triploid Grass Carp producers are likely to object to the use of NTGICP 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 NTGICP, triploid Grass Carp producers are likely to object to the use of NTGICP 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.

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August 15

2014

ICRA
Mississippi Interstate Cooperative Resource Association
9053 Route 148 Marion, IL 62959 – (618) 997-6869

National Analysis of Grass Carp (*Ctenopharyngodon idella*)

REGULATION, PRODUCTION, TRIPLOID CERTIFICATION, SHIPPING AND STOCKING

HDR

For best results and understanding, this report should be printed in color and read in its entirety.

National Analysis of Grass Carp (*Ctenopharyngodon idella)* Regulation, Production, Triploid Certification, Shipping and Stocking

August 15, 2014

Prepared for:

Mississippi Interstate Cooperative Resource Association (MICRA)
9053 Route 148
Marion, IL 62959
Agreement #: MICRA-12-001

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Acknowledgments

The following agencies have contributed to this report entitled, **National Analysis of Grass Carp (*Ctenopharyngodon idella*) Regulation, Production, Triploid Certification, Shipping and Stocking**. Their cooperation and assistance is gratefully acknowledged.

AK Department of Fish and Game	MT Fish, Wildlife and Parks
AL Department of Conservation and Natural Resources	NC Division of Inland Fisheries
AR Game and Fish Commission	ND Game and Fish
AZ Department of Game and Fish	NE Game and Parks
CA Department of Fish and Wildlife	NH Fish and Game Commission
CO Department of Agriculture	NJ Department of Environmental Protection
CO Parks and Wildlife	NM Department of Game and Fish
CT Bureau of Fisheries	NV Department of Wildlife
DE Division of fish and Wildlife	NY State Department of Environmental Conservation
FL Game and Freshwater Fish Commission	OH Department of Natural Resources
GA Department of Natural Resources	OK Department of Wildlife Conservation
HI Department of Agriculture, Aquaculture & Livestock Support Services	OR Department of Fish and Wildlife
IA Department of Natural Resources	PA Fish and Boat Commission
ID Department of Fish and Game	RI Department of Environmental Management Fish and Wildlife
IL Department of Natural Resources	SC Department of Natural Resources
IL Natural History Survey	SD Game, Fish and Parks
IN Department of Natural Resources	TN Wildlife Resources Agency
KS Department of Wildlife, Parks and Tourism	TX Parks and Wildlife Department
KY Department of Fish and Wildlife Resources	United States Geological Survey
LA Department of Wildlife and Fisheries	United States Fish and Wildlife Service
ME Department of Inland Fisheries & Wildlife	University of Hawaii Aquaculture Extension
MD Department of Natural Resources	UT Department of Agriculture
MA Department of Fish and Game	VA Department of Game and Inland Fisheries
MI Department of Natural Resources	VT Fish and Wildlife Department
MN Department of Natural Resources	WA Department of Fish and Wildlife
MS Department of Wildlife, Fish and Parks	WI Department of Natural Resources
MS Department of Agriculture and Commerce	WV Department of Natural Resources
MO Department of Conservation	WY Game and Fish Department

List of Acronyms

ANS	Aquatic Nuisance Species
BMP	Best Management Practices
HACCP	Hazard Analysis and Critical Control Points
MICRA	Mississippi Interstate Cooperative Resource Association
MOA	Memorandum-of-Agreement
MRB	Mississippi River Basin
MRBP	Mississippi River Basin Panel
NGO	Nongovernmental organizations
NTGCICP	National Triploid Grass Carp Inspection and Certification Program
NYIS	New York Invasive Species
QA/QC	Quality Assurance/Quality Control
SOP	Standard Operating Procedures
UMESC	Upper Midwest Environmental Science Center
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1 Executive Summary

MICRA contracted HDR to conduct an in-depth national analysis of grass carp regulation, production, triploid certification, shipping and stocking. This effort was intended to determine if the public and private entities producing, certifying, shipping, stocking and regulating grass carp are employing effective and integrated actions to safeguard aquatic resources by preventing accidental or illegal introduction of diploid or triploid grass carp.

USFWS representatives, state agency representatives, grass carp producers and grass carp distributors were formally questioned to gain a nationwide perspective of the grass carp industry. The data collected and major conclusions determined as a result the analysis are discussed within this document. Although grass carp were reported by state agencies as a proven alternative to chemicals for aquatic weed control, their nuisance was reported as well. This document is not intended to deliberate the effectiveness, risk or perception of grass carp but instead is intended to document a state-by-state analysis of the current grass carp regulation, production, triploid certification, distribution and stocking.

This report consists of the following sections:

- **Section 2** provides project background and overview.
- **Section 3** outlines general locations of grass carp at the time of this report in order to provide a baseline for some of the state rationales and regulations.
- **Section 4** summarizes the data collected during an extensive effort to interview and visit federal, state and private entities involved with grass carp.
- **Section 5** provides an analysis of the data collected.
- **Section 6** lists three alternatives for consensus across the grass carp industry and provides recommendations
- **Section 7** provides a brief conclusion.

State-by-state surveys were made within the federal, state and private entities. Rules and Regulations, Inspection and Enforcement, Stocking Records, Illegal or Accidental Introduction, and Standard Operating Procedures (SOP) or Best Management Practices (BMP) were analyzed. The data conclusions made in this report were based upon data provided to HDR by cooperating state agencies, and commercial producers and distributors. Since there is no requirement for a national reporting system with a standardized template for grass carp production and stocking record keeping, gaps in the data have inherent in the analysis. These data gaps are identified and discussed in the report.

The overarching theme detected during the analysis of the grass carp industry was the nationwide difference in perceptions and operations as shown in **Figure A** below. Within the cooperating producers stocking grass carp in states with monitored programs, the NTGCICP was viewed as quite effective because of standardized protocols, procedures, inspections and consequences for accidental or inappropriate stockings of grass carp. However, analyzing the program from the perspective of all 50 states provides a different opinion. With up to three different categories of grass carp regulations present, often between bordering states (**Figure A**), the nationwide effectiveness of the NTGCICP program is reduced. A nationally coordinated and federally supported approach is needed to successfully implement an effective, integrated grass carp

management plan. A truly effective program would be one that manages consistencies nationally thus increasing the breadth of the program to include states, producers and distributors and developing consistent rules and regulations among states and at a truly national level.

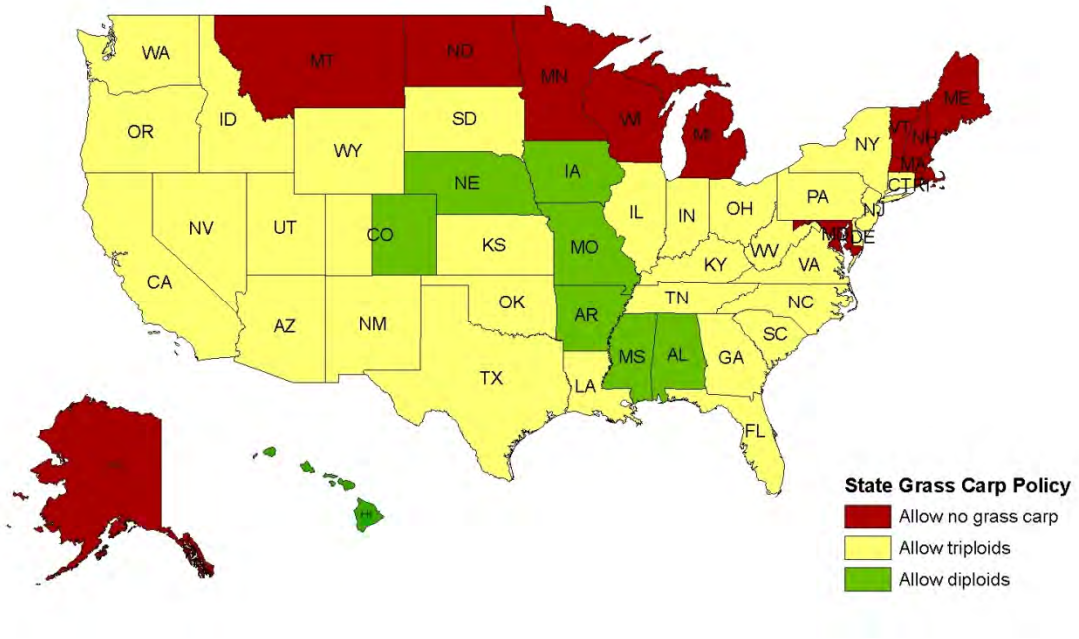


Figure A. Type of Grass Carp Allowed for Each State

The USFWS NTGCICP has certified almost five million triploid grass carp for nine producers in the past ten years in order to provide reassurance to triploid states that alleged triploids are not actually diploid grass carp. The effectiveness of this program can be extended, even within states that allow diploid stockings, provided a consistent nationwide message and program are promoted. More awareness of state by state regulations by distributors and the general public is warranted. Without nationwide consistency and management, the effectiveness of the program will be confined within the limits of the few certified producers already in operation. This document preparation and scope, which was managed by a collection of private producers, agencies and state and federal representatives, provided a vital first step in that nationwide consistency by collectively documenting the current operating conditions of each state and program. While nationwide concurrence on the use, effectiveness and risk associated with grass carp is unlikely to be reached quickly, promotion of effective measures through education and improved record keeping can begin immediately.

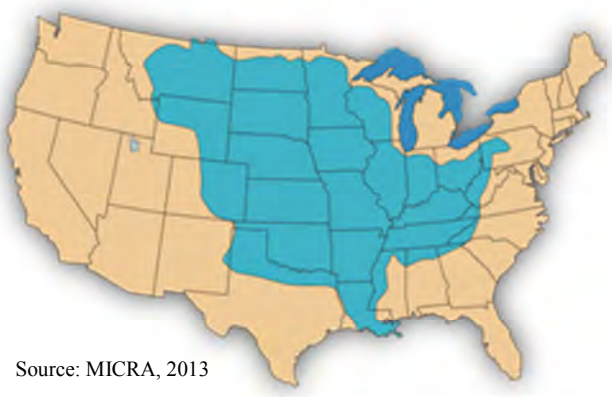
2 Introduction

2.1 Background

Bighead carp (*Hypophthalmichthys nobilis)*, silver carp (*Hypophthalmichthys molitrix)*, black carp (*Mylopharyngodon piceus)* and grass carp (*Ctenopharyngodon idella)* are collectively referred to in the United States as Asian carps. Asian carps have been an issue challenging Mississippi River Basin states (**Figure 1**) and the nation as a whole for many years due to their ability to reproduce quickly and compete with native fish populations (UMESC, 2014). For this reason, multiple state and federal agencies, private aquaculture companies, consultants and nongovernmental organizations participated in the development of the *Management and Control Plan for Bighead, Black, Grass, and Silver Carps in the United States* (Control Plan) (Conover *et al*., 2007). Mississippi Interstate Cooperative Resource Association (MICRA) and the Mississippi River Basin Panel have identified several recommendations from the Control Plan as high priority and are working to implement these recommendations. Included within the recommendations are several strategies for the management of grass carp. According to the Control Plan, grass carp:

- Can alter aquatic ecosystems and have undesired consequences.
- Can migrate long distances and impact management efforts in neighboring states.
- Have established self-sustaining populations in several rivers in the United States.

For these reasons, the Control Plan recommended that states either prohibit the stocking of grass carp or alternatively, only allow the stocking of certified triploid grass carp within watersheds where grass carp are already present in the wild (Conover *et. al.*, 2007). Another recommendation was to evaluate the effectiveness of the triploid certification program and to recommend reasonable actions that would improve the integrity, efficiency and effectiveness of the program (Conover *et al*., 2007).



Source: MICRA, 2013

Figure 1. Map of the Mississippi River Basin

Grass carp were introduced into the United States by the US Fish and Wildlife Service Fish Farm Experiment Station in Stuttgart, AR and Auburn University in 1963 as a low-cost, eco-friendly alternative for aquatic vegetation control in ponds and lakes (Mitchell and Kelly, 2006) In 1966, grass carp were successfully spawned at both facilities and in 1971 fish from the 1966 year class were showing up in the Illinois portion of the Mississippi River (Greenfield, 1973). From that time on, the grass carp has expanded its range throughout the Mississippi River drainage with established populations from the lower Mississippi River up through the Illinois River, Missouri River and Ohio River, and reports of fish in 45 U.S. states (Nico & Fuller, 1999).

The grass carp species grows very quick, lives an average of seven years and eats up to three times their body weight a day (National Park Service, 2014). The species has tremendous reproductive capacities as a female will average about 820,000 eggs/female. (Gorbach, 1972).

Grass carp are naturally diploid (2N=48), but because of the negative impacts of unwanted population expansions, sterile triploids (3N=72) were developed to create non-reproductive fish. Hydrostatic pressure has been the most consistent method for widespread commercial production of triploid grass carp, but this type of treatment does not always result in 100% triploidy (Rottman et al., 1991). Hence, many states require that each individual fish must be verified to be triploid before it can be stocked into waters of a state. The USFWS, as a third party, conducts ploidy verification on subsamples of fish that are to be shipped out and stocked into waters of states that require triploid grass carp stockings only.

2.2 Project Overview

MICRA contracted HDR to conduct a national analysis of grass carp regulation, production, triploid certification, shipping and stocking. This effort was intended to determine if the public and private entities producing, certifying, shipping, stocking and regulating grass carp are employing effective and integrated actions to safeguard aquatic resources by preventing accidental or illegal introduction of diploid or triploid grass carp.

In summary, the purpose of the study is to:

- Gain a nationwide perspective of the grass carp industry
- Collect and analyze information on a state-by-state basis
- Collect and analyze information from grass carp producers and distributors
- Evaluate the effectiveness of the USFWS National Triploid Grass Carp Inspection and Certification Program
- Provide recommendations based on the outcomes of the analysis

This report provides a summary of these tasks, identification of sources and pathways for accidental or illegal introductions of diploid or triploid grass carp, and recommendations for reducing these sources and pathways. MICRA provided several specific objectives for HDR and created an independent steering committee to oversee the process of completing these objectives. The steering committee was comprised of representatives from state and federal natural resource agencies and private industry. A description of each objective is listed below.

Objective #1	**Gather, analyze, and summarize regulations, SOPs and BMPs** employed at commercial **triploid** grass carp **production** facilities to **contain** grass carp and **prevent diploid contamination** of certified lots of triploid grass carp. This information was collected during interviews with each state regarding regulations and during interviews with the USFWS, state representatives and private facilities and site visits pertaining to SOPs and BMPs. Additional information was collected on state and federal websites. Data collection is summarized in **Section 4**; analysis is presented in **Section 5**.
Objective #2	Analyze the effectiveness of the **National Triploid Grass Carp Inspection and Certification Program** at preventing the shipment of diploid grass carp.

	This analysis is presented in **Section 5**. The program was determined to be effective in relation to current standards and operations. Considering the entire grass carp industry as a whole, the effectiveness of the program is confined to the nine participating producers and grow-out facilities, which is a small fraction of the hundreds of grass carp producers and distributors.
Objective #3	Collect and analyze **SOPs** and **BMPs** employed by commercial fish haulers to prevent the contamination of diploid grass carp in triploid shipments and to prevent the introduction of diploid or triploid grass carp in water bodies where either fish is prohibited. This information was collected during interviews with private facilities and during site visits. A lack of SOPs and BMPs was discovered and is summarized in **Section 4**.
Objective #4	Analyze inspection programs, regulations, and enforcement employed by **states** receiving certified shipments of triploid grass carp to ensure that grass carp are stocked in accordance with state regulations. An analysis of regulations, inspection protocols and enforcement was completed based on information provided by state agencies and cross-checked during interviews with private facilities. Data analysis is presented in **Section 5**. Overall, a lack of consistency among state regulations and lack of en-route inspections and enforcements was identified.
Objective #5	Compile state rationale, regulations and regulatory implementation regarding triploid or diploid grass carp importation, possession, transportation, culture, sale and stocking. This information was gathered during interviews with state representatives and is summarized in **Section 4**. All of the items above varied among states, with a lack of consistency, even among states that had the same ploidy requirements. Furthermore, information obtained from states sometimes varied between representatives when interviews were conducted with more than one person in the same state. It was also difficult to collect the information since, in some circumstances, it did not exist, it was not available for distribution, it was not compiled or the person interviewed didn't know the information.
Objective #6	Identify and analyze sources and pathways in the production, **triploid** certification, shipping, and stocking of grass carp not covered in the previous objectives whereby **diploid** grass carp may enter the triploid supply chain. This information was collected during the interview process with federal and state representatives and grass carp producers and distributors. Actual and perceived pathways are documented in **Section 4**. Additional analysis is presented in **Section 5**. Multiple pathways were identified. Some states provided actual examples that had occurred, while other states had not had any occurrences and instead provided perceived pathways.
Objective #7	Recommend reasonable actions (SOPs or BMPs) and/or regulations, where necessary, for producers, inspection programs, shippers, and states to reduce the risk of unintended introductions of diploid grass carp.

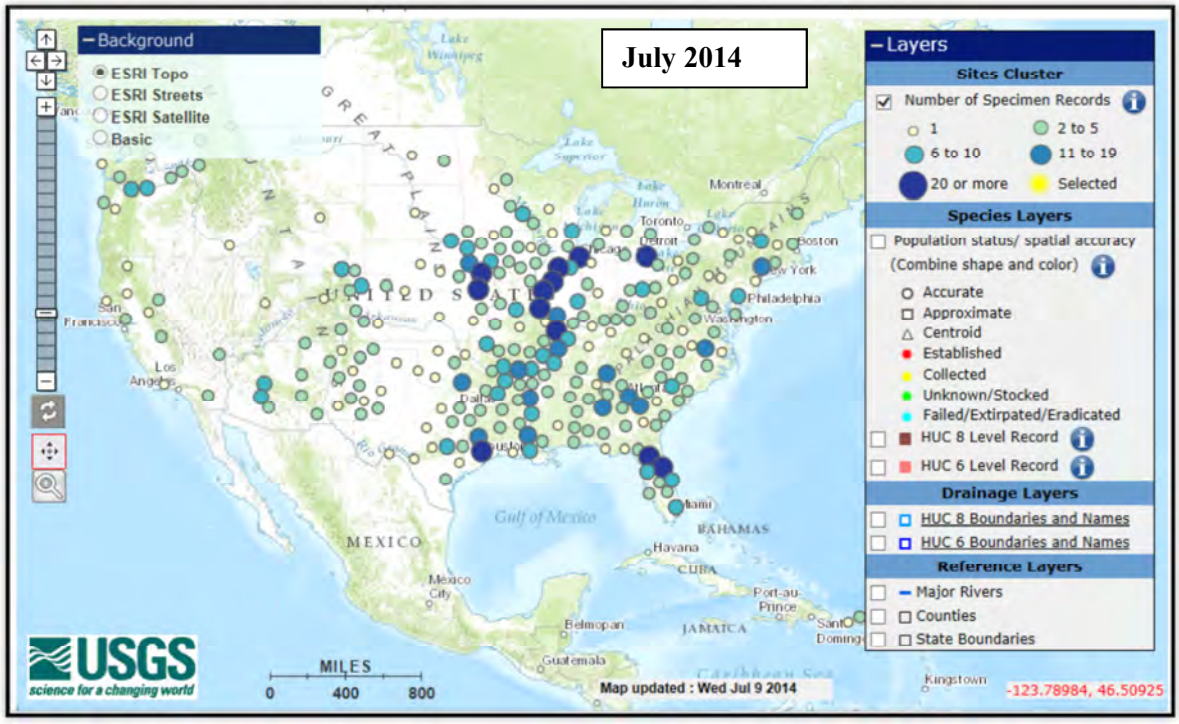
	Recommendations are presented in **Section 6**. They were developed based on the data collection and analysis presented in **Sections 4 and 5**.
Objective #8	Additional analysis is presented in **Section 5**. Gather, analyze, and summarize the annual production/rearing, sales, shipment, and disposition of **diploid** grass carp. This information was gathered from state provided stocking records and is summarized in **Section 4**; however, state records do not differentiate between diploid and triploid grass carp so inferences were made based on data gathered from states that allow diploids. Stocking records were not obtained from private producers or distributors. All requests were denied, except for one that was willing but never provided the records and one that was willing but did not have electronic records to provide.

In order to meet these objectives, HDR interviewed federal, state and private entities via site visits and telephone, and requested a variety of data. The general methodologies used are outlined below:

- Existing Triploid Program Analysis: HDR interviewed a representative of the USFWS TGCICP and received a summary of their triploid grass carp certification records, as well as a list of producers and inspectors in their program and a copy of producer standards.
- State Interviews: HDR reviewed current regulations for each state. Each state was also asked to provide a rationale for their regulations. State triploid grass carp programs/regulations were discussed with state representatives, and analyzed for effective ways to monitor triploid grass carp shipments.
- Producer and Distributor Interviews: A comprehensive list of diploid and triploid grass carp producers and distributors across the nation was compiled. HDR attempted to contact each distributor at least twice. Interviews were conducted with those willing to cooperate.
- Accidental or Illegal Pathways: During the interview process, HDR asked about the potential avenues for illegal and accidental transport and stocking of grass carp.
- Facility Visits: Site visits were completed at facilities in Alabama, Arkansas, Illinois, Indiana, Kentucky, Mississippi and Missouri.
- Program Analysis: This report includes the presentation and analysis of data collected, including stocking and certification records, commercial fishing records, grass carp dispositions, the number and type of grass carp facilities, state regulations, federal program standards, and SOPs, BMPs or HACCP plans. Data and information gathered were compared between federal, state and private entities.
- Recommendations: A comparative data analysis was performed to identify strengths, inconsistencies and inefficiencies from a nationwide perspective. Recommendations were developed as considerations to improve the consistency in operations for the whole grass carp industry and reduce the risk and occurrence of accidental or illegal introductions.

3 Grass Carp Presence

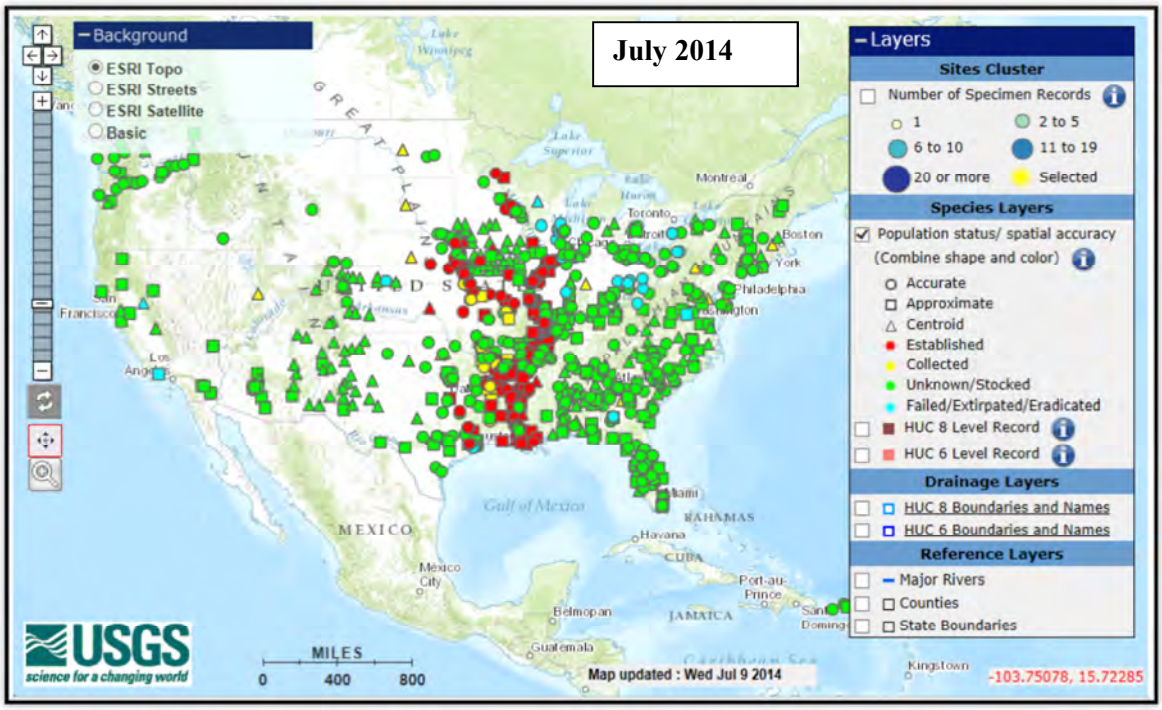
Figure 2 represents a compilation by the United States Geological Service (USGS) of the grass carp records across the United States. **Figure 3** outlines the locations of established populations of grass carp throughout the United States. The maps were downloaded on July 9, 2014 (USGS, 2014) and rechecked again August 6, 2014 for any updates. Grass carp records are compiled for each documented occurrence or location of populations but do not indicate quantity of fish. The records included grass carp that were collected, stocked, established or eradicated. Specific dispositions were not noted. The data show that grass carp occurrences are primarily located in the Midwest but the incidence is spreading. HDR is not responsible for possible inaccuracies. *Personal communication with officials in Minnesota indicate that there are not established populations of grass carp in their state, even though the figure indicates that there are established populations of grass carp.*



Source: USGS, 2014

Note: Does not imply species abundance

Figure 2. Number of Grass Carp Records Compiled by USGS



Source: USGS, 2014 **Note: Does not imply species abundance**

Figure 3. Population Status of Grass Carp Compiled by USGS

4 Summary of Data

HDR underwent an extensive data collection process. The primary method of data gathering was via phone interviews with USFWS, state natural resource agencies and private grass carp producers and distributors. A set of questionnaires was developed and reviewed by the project steering committee. Questionnaire templates for federal, state, producers and distributors are provided in **Appendix B** as a reference. This section provides a summary of information gathered via the interview process, including data that was provided to HDR post-interview. The data discussion will be presented in the following order: Federal, State and Private. It is important to note that HDR is not responsible for information not gathered due to lack of cooperation, lack of existence or inaccurate information reported in the interview process. Over three hundred interviews were conducted in an attempt to obtain comprehensive information. The forthcoming summary of data is therefore, only as good as the data that was obtained. Data gaps are present and are identified.

4.1 Federal

4.1.1 USFWS Inspection and Certification Program Overview

As of 2014, there are no federal regulations for grass carp management and each individual state has their own regulations, if any. The Control Plan recognized that the use of triploids to prevent self-sustaining populations of grass carp is dependent upon the effectiveness of an inspection

program to identify and remove diploid grass carp at the triploid production facilities. The NTGCICP was established in 1995 to provide that function (USFWS, 2014).

Senate Report 104-51 (104th Congress, 2014) describes the certification process prior to the establishment of the NTGCICP as summarized below. The USFWS became involved in inspecting and certifying triploid grass carp in 1979 (House Report 104-189) and between 1985 and 1995 they provided ploidy verification as a service to the states. In January 1995, USFWS announced that it would no longer provide this service to private grass carp producers due to high costs associated with inspections. State agencies were concerned about impacts to their native species and habitats if USFWS stopped inspections and certification, since USFWS provides a scientifically credible third party for triploid grass carp certification. Private producers notified USFWS and Congress that they would be willing to bear the costs of the program. On April 5, 1995 a bill was passed in the Senate which re-designated the USFWS role in grass carp inspections and certifications, whereby a fee structure would be used for private grass carp producers to pay for the NTGCICP (104th Congress, 2014).

The purpose of the NTGCICP (USFWS, 2014):

> *is to provide assurance to natural resource agencies, and others concerned about protecting aquatic resources, that shipments of grass carp alleged to be all triploid, do not, within the confidence limits of the inspection program, contain diploids.*

The NTGCICP includes four critical elements:

(1) Standards for USFWS Inspectors

(2) Standards for Grass Carp Producers

(3) Standards for Collection and Fees

(4) Standard Fees and Penalties Program

The standards are reviewed annually at the official public meeting between triploid producers and USFWS inspectors, and if necessary, are updated within one year. The standards outline requirements for USFWS inspectors and private producers. These groups work together to ensure that alleged triploid grass carp are certified as such. In order for private producers to be part of the NTGCICP, the producer must sign a Memorandum-of-Agreement (MOA) with USFWS. The MOA outlines the requirements and potential penalties associated with non-compliance. In order to promote good practices, a Quality Assurance (QA) incentive program allows producers to earn a limited amount of credits to offset penalties associated with occasional failures due to temporary glitches in their system. Actual use of credits to offset penalties is uncommon (pers. corr. Wayman, 2014).

The information presented below in reference to the USFWS NTGCICP was obtained from the program web site (USFWS, 2014), through interviews conducted by HDR and correspondence with USFWS staff (pers. corr. Mudrak, 2013 and pers. corr. Wayman, 2014). Supplemental information was received from HDR's attendance at the NTGCICP annual meeting. Example documents are provided in **Appendix E**.

4.1.2 Methodology

There are two ploidy testing methodologies for grass carp: a standardized Coulter counter and flow cytometry. The most common and only NTGCICP approved testing method is a standardized Coulter counter to distinguish particle sizes. The size of the nucleus is different for

diploid and triploid cells. The method is simple, precise and easy to implement and does not require an elaborate setup (Mudrak, 2013). However, another test which has a potentially higher degree of accuracy is flow cytometry. Studies have so far produced mixed results so it is not currently accepted as a ploidy measurement method for the NTGCICP. If flow cytometry becomes faster and costs decrease, it may become more accepted in the future. Only flow cytometry can be used for testing fry.

The NTGCICP requires that the producer check the ploidy of every grass carp in the lot designated for certification prior to the USFWS inspection. The USFWS inspector witnesses the retesting of an approved statistical sample size of fish for verification of ploidy. If there is a failure for any reason, the entire lot fails and a penalty and/or suspension is imposed by the USFWS. Prior to a second inspection, every grass carp must be retested. These requirements have caused the producers to increase their operational precision and accuracy over time (Mudrak, 2013). A sample verification checklist is provided in **Appendix F**.

The NTGCICP (2013) has nine producers, with eight being active and one inactive. The active producers are located in Arkansas, Illinois, Alabama and Georgia (**Figure 4**). These producers have voluntarily signed and comply with an MOA with USFWS to participate in the program and abide by program rules. This means that producer standards, including SOPs and BMPs, are followed. The program currently (2013) has 14 inspectors, including nine active and five inactive. Of the active inspectors, there is one primary inspector assigned to Arkansas, one primary Inspector assigned to Georgia and Alabama, and one primary inspector assigned to USFWS Region 3, which includes Illinois. An additional 6 inspectors are assigned as alternate inspectors in these states or regions.

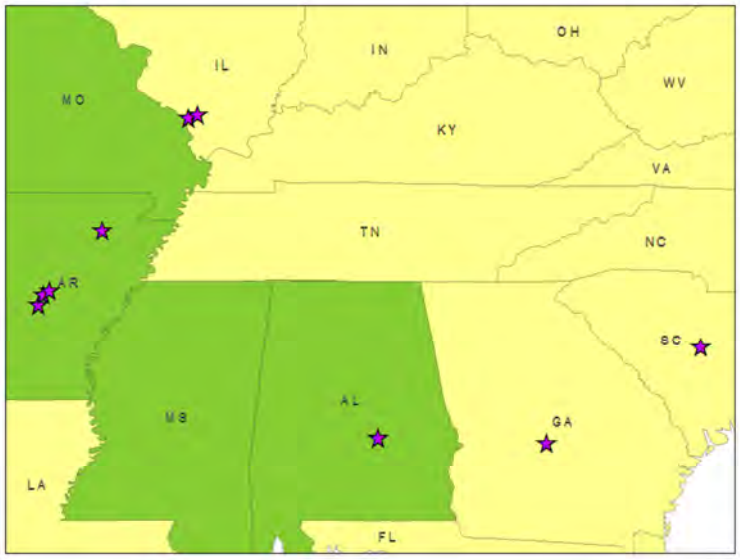


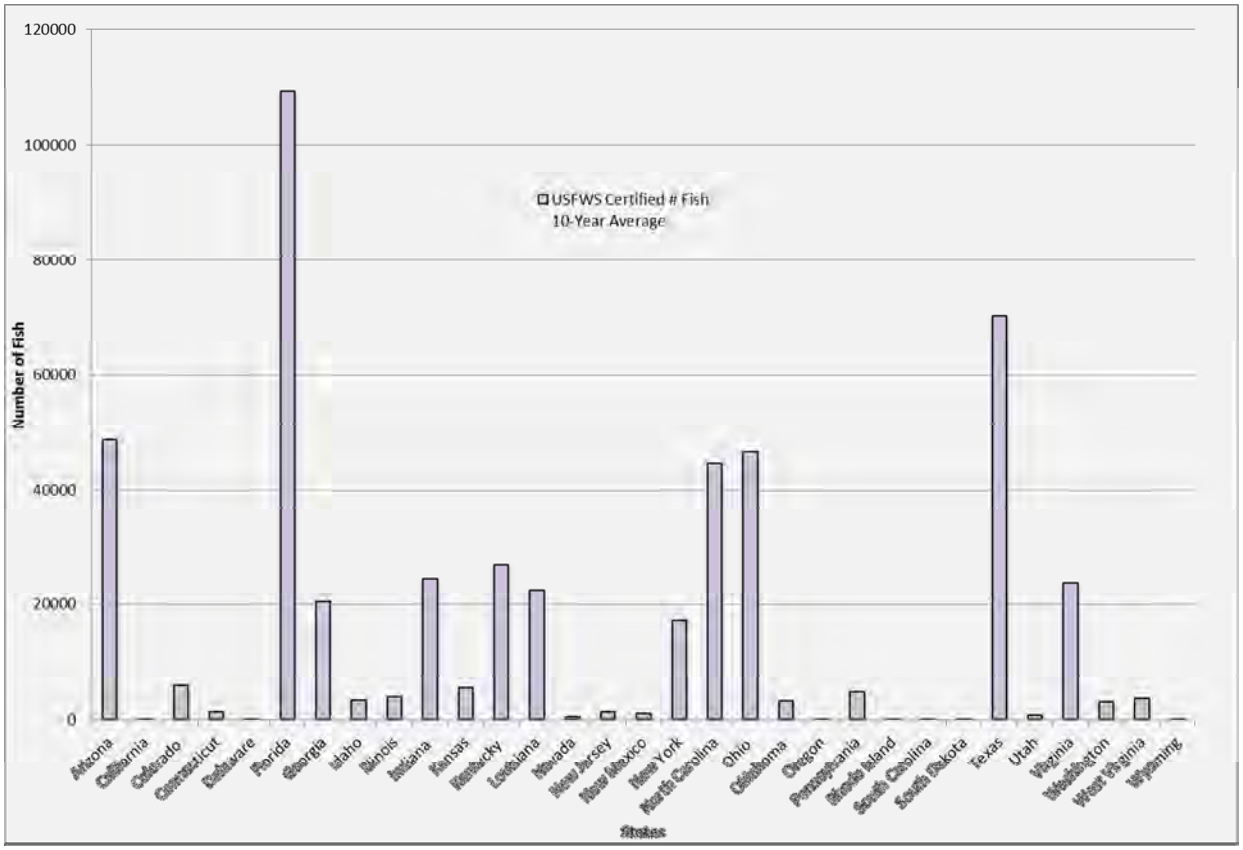
Figure 4. NTGCICP Producers (USFWS, 2013)

4.1.3 Certification Records

A database has been maintained at the Warm Springs Regional Fisheries Center for ploidy testing performed at production facilities in the program since 1998. USFWS Inspector's individual on-site test records are used to populate the database. During inspection, the producer

indicates how many fish are in the lot to be certified and the destination of the fish. Certificates are then prepared for each shipment of fish and expire within seven days. USFWS provided triploid grass carp certification records for each state over the past ten years for the purpose of this study. All ten years of data provided by USFWS is included in **Appendix C**.

Figure 5 illustrates the average numbers of triploids that were certified by the USFWS for the states that require certified triploid grass carp. These data represent numbers of certified triploid grass carp that are reported to be distributed to a particular state. It is important to note that the graph represents the number certified, not necessarily the number stocked or delivered. Since producers operating in-state are under state guidance and permitting, not all states require USFWS triploid certification. In addition, several states have reciprocal agreements with other states that do not require USFWS certification for interstate movement of triploids. The following figure does not represent total number of grass carp stocked by state but is the best possible representation for an estimated number of USFWS certified triploid grass carp stocked per state.



Source: USFWS, 2013

Figure 5. USFWS Certified Triploid Grass Carp Records, 10-Year Average

On average, Florida and Texas are reported to receive the highest numbers (110,000 and 70,000 respectively) of triploid grass carp certified by USFWS per year. Arizona, North Carolina and Ohio are reported to receive around 45,000 USFWS certified triploid grass carp per year.

Georgia, Indiana, Kentucky, Louisiana, New York and Virginia are reported to receive approximately 20,000 USFWS certified triploid grass carp per year. The remaining states are reported to receive less than 5,000 USFWS certified triploid grass carp on average per year. Those that do not receive USFWS certified triploid grass were not shown in the figure.

For states that allow diploids, the average number of USFWS certified triploids reported to be received was less than 100, with the exception of Alabama, which averaged almost 2,000 certified grass carp. Those fish are likely going to the Alabama state hatcheries for grow-out purposes based on information received during an interview with the state agency.

Overall, certification records provided by the USFWS over the past ten years indicated that the NTGCICP has certified 4,960,413 triploid grass carp and issued 13,727 certificates. A total of 2,812 inspections were performed, 33 failures were reported among nine different producers and 14 of those failures were from one of the nine producers. This equates to a failure incidence rate of approximately 1% for the ten year period. Four of the producers had no failures. USFWS indicated that failure rates dropped from a maximum of seven percent to a maximum of two percent after the USFWS fee structure for the program was expanded in 2002. The NTGCICP has proven to be effective for those states and producers who participate in the program.

4.1.4 Enforcement

Producers that enter the NTGCICP are subject to penalties such as monetary fines or suspensions for non-compliance. Multiple offenses can lead to termination from the program. Non-compliance issues include (USFWS, 2014):

- Diploids found during inspection
- Non-functioning equipment during inspection
- Non-conformance with isolation requirements and labeling requirements
- No evidence of ploidy testing prior to inspection
- Incorrect maintenance of fish that require retesting
- Incorrect fish sample selection
- Poor water quality allowing for poor fish visualization
- Incorrect number of fish or invoice does not match certificate
- Falsifying records or signatures
- Bribery or intimidation towards Inspectors
- Fraudulently selling non-certified carp as certified
- Lacey Act felony violation related to movement of triploid or diploid grass carp
- Failure to pay inspection fees and penalties

4.1.5 SOP/BMP

The NTGCICP has Standard Operating Procedures (SOP) and Best Management Practices (BMP) outlined for both inspectors and producers through published USFWS Standards (**Appendix E**). In addition, there are several checklists provided on the website for use by the participants to help standardize operations. USFWS inspectors share case discussions and scenarios for guiding inspections during the annual meeting which corresponds with the annual review and update of the standards

NTGCICP producers follow standards for on-site presumptive testing, fish-tank labeling for grass carp isolation, and the on-site ploidy verification inspection. Since each producer facility is

somewhat different, SOPs for on-site inspections and their QA/QC aspects may vary but the USFWS Inspector helps develop and approves each producer's SOP. Part of the MOA requires that each facility have a written protocol to follow in the event that a suspect fish is detected that takes into consideration the individual layout of each facility. Inspectors keep these protocols for reference during an inspection (pers. comm., Mudrak, 2013). Moreover, individual QA/QC Plans are customized and implemented for each facility depending on their equipment and operational protocols.

Inspection data is retained on Inspection Certificates and datasheets. Since implementation of the MOA process, a formal worksheet has been developed to standardize collection of QA/QC data for each inspection, and an inspector's log is maintained for QA/QC of equipment and on-site conditions. Example checklists obtained from the NTGCICP website are provided in **Appendix F**. Inspector records help provide assurances that an external variable (power fluctuation, water conditions, reagent shelf-life, etc.) does not impede test accuracy and impact results.

4.1.6 Illegal or Accidental Introduction

Mr. Mudrak reported that the USFWS does not identify illegal acts but the NTGCICP serves as an entity to identify accidental introductions via triploid grass carp certification. The following potential avenues for illegal or accidental introductions were provided:

- Producers who have had a track record of legal problems.
- Fish hauling operations that move grass carp and other fish into several states; and which may add fish to the shipment as they move from site to site.
- Locations where grass carp are being advertised for sale along the border of states that have differing regulations.

Further information about the Program can be found by visiting the NTGCICP website (USFWS, 2014). This report provides a general overview, but the website provides specific information about inspector requirements, producer requirements and fee collection or penalties. It also provides checklists, a glossary of terms and general grass carp information.

4.2 State

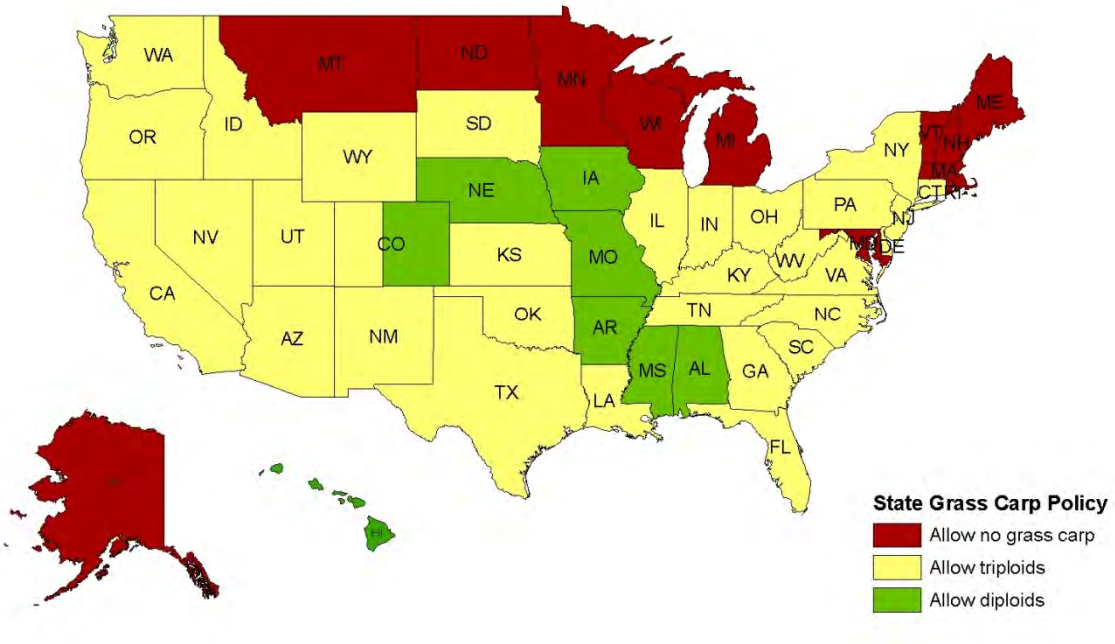
HDR contacted at least one representative from all 50 states to collect information regarding grass carp regulation, production, triploid certification, shipping and stocking. Representatives included fish chiefs, aquaculture coordinators, ANS coordinators and permit coordinators from the state agencies listed at the beginning of the report. A one page template, approved by the steering committee, was used to facilitate the interview and a copy is provided in **Appendix B**. A summary of the information gathered from interviews is provided below.

Based on 2013 regulations, 30.5 out of 50 states (61%) allow triploid grass carp stockings for biological control of nuisance aquatic vegetation, 7.5 states (15%) allow diploid stockings and 12 states (24%) prohibit grass carp. Colorado is counted as half yellow and half green because diploids are allowed in the eastern half the state but not in the western half. Diploids are prohibited in the western half since it falls within Colorado River Basin and Rio Grande River Basin fish recovery efforts.

4.2.1 Rationale

Grass carp regulations for all 50 states were reviewed. Each state has a policy regarding whether grass carp can be stocked and if so, which type, triploid or diploid (**Figure 6**). USFWS developed the following color coding for categorization for which types of grass carp are allowed. This color scheme is echoed throughout this report.

Prohibit Grass Carp	**12 states**
Allow Triploid Only	**30.5 states**
Allow Diploid	**7.5 states**



Source: State Agencies (2013)

Figure 6. Type of Grass Carp Allowed for Each State

After finding out whether states allowed or restricted triploid and diploid grass carp, each state was asked what their rationale was for selecting their policy. Responses varied and the main types of responses are summarized below for each main category type.

Rationale – Red States, Prohibit all Grass Carp

- Determined to be more detrimental than beneficial
- Need Eurasian water milfoil control but this plant is not preferred by grass carp
- Climate not conducive for beneficial weed control
- Inter-specific competition for food with invertebrates (e.g. crayfish) and other fishes

- Want to minimize changes in the composition of native and healthy macrophyte, phytoplankton and invertebrate communities
- Grass carp waste can cause spikes in algae or non-preferred plankton since they do not have a highly effective digestive system
- There are plenty of approved chemicals for aquatic macrophyte control
- It is not acceptable to use non-native species to control native plants
- Rules were formed when the process of triploid production was not perfected
- Detrimental to restoration efforts of native grasses
- Want to prevent impacts to native recreational and commercial fish species
- Existing waters are relatively disease free with few invasive species
- Concerned about problems related to escape or movement by anglers
- Have witnessed issues encountered from grass carp and do not want those problems
- Interfere with the reproduction of other fishes
- Decreases refugia and habitat for other fishes
- May carry parasites and diseases potentially transmissible to native fishes
- Paperwork to track ploidy and effort to control grass carp was too problematic when triploids were allowed

Rationale – Yellow States, Allow Triploid Only

- Recognize the need for vegetation control and therefore allows grass carp to help the ecosystem
- Allow for vegetation control only in a closed system
- Triploids are cheaper than chemicals for vegetation control and they don't reproduce
- Use triploids for sterility because so much money is wasted trying to control invasive species that are able to reproduce
- Biological reasoning (i.e., protecting habitat from reproductive grass carp) rather than an enforcement issue
- Sterile grass carp offers water body owners an inexpensive form of weed control
- Requiring triploids allows for protection of native species
- Allow triploids over completely prohibiting because the state would rather regulate the grass carp coming in. If they prohibit, then the fish could be more likely to be brought in illegally.
- USFWS requires that diploids are restricted to preserve the native species and threatened and endangered species in a particular natural area

Rationale – Green States, Allow All Grass Carp

- Diploids have been present for a long time without posing problems in our state
- Usefulness for nuisance vegetation control far outweighs detriments
- Revenue provided when caught by commercial fishermen and then sold

- Provides food source when caught
- Diploid stocking is 4 to 5 fold cheaper
- Costs to make the change would be high
- State tried to prohibit diploids but private industry objected
- Habitat not conducive to spawning so natural reproduction does not occur
- Reduces herbicide use and originally reported as better than herbicides
- Increases access and use for shoreline activities by reducing vegetation
- Stocking occurs in impoundments which prevents completion of grass carp life-cycle
- Triploid only would impact the availability of getting fry instead of fingerlings
- Couldn't convince surrounding states to be triploid so couldn't justify being triploid
- Produced triploids at a state level for years but didn't feel it was making an environmental impact
- Other Asian carps are the majority in numbers
- State biologists do not have issue with diploids

Three of the states that allow diploids also have restrictions such as no stocking of grass carp by the state or in state-owned waters (Iowa), raising and/or stocking only triploids in state water bodies (Alabama and Mississippi) or written recommendations for the use of triploids only (Mississippi). Some of these states have attempted, or are in the process of proposing triploid only regulations, but have not been able to reach consensus among policy makers, natural resource agencies and private industry. Although there is a conscious effort in these four states to restrict or reduce the number of diploids produced or stocked in the state, no laws are in place.

Representatives from diploid states also had the following comments about whether they would consider changing their policies to prohibit diploids.

- If all surrounding states only allowed triploid, they would likely change policy.
- Herbicide use is now the norm so diploids might be banned in future.
- Diploids are allowed but triploids are required for use in state hatcheries and for stocking in public waters.
- If a federal policy was in place that provided more guidance, then they would be more likely to change.

4.2.2 Rules and Regulations

Regulations pertaining to grass carp were gathered and reviewed for each state. Furthermore, specific questions were asked of state agency representatives to gain further insight and clarifications. Rules and regulations regarding grass carp for each state are summarized below in **Table 1** which has been sorted by whether states allow or prohibit diploid grass carp (i.e., red, yellow and green). This is not an all-inclusive representation of regulations but it does provide highlights for comparison purposes. Much of the table was populated by responses received during interviews with state representatives, assuming the information provided was correct. Adjustments were made based on review of written regulations. It is important to note that this is just a snapshot in time (2013) and regulations may change on an annual basis.

Table 1. Summary of Grass Carp Rules and Regulations

		Prohibited Activities					Activities Requiring Permits					Reporting Requirements					
State	Multiple Regulating Agencies	Triploid Grass Carp Possession	Diploid Possession	Diploid Stocking	Wild-Caught Grass Carp Possession	Catch and Release	Fish Propagation	Fish Distribution	Fish Importation	Public Water Stocking	Private Water Stocking	Copy of USFWS Certification	Stocking, Sales or Permitting	Commercial Catch Records	BMPs or SOPs	Enforcement	Manual Inspections
Alaska		X	X	X	X	X	NA	NA	NA	NA							
Maine		X		X	X	X	Unlikely	NA	X	NA	NA						
Maryland		X	X	X	X	NR	NA	NA	NA	NA	NA						
Massachusetts	X	X		X	X	X	Unlikely	NA	Unlikely	NA	NA					X	
Michigan	X	X	X	X	X	X	NA	NA	NA	NA	NA			X		X	
Minnesota		X		X	X	X	X							X			X
Montana		X	X	X	X	X	NA	NA	NA	NA	NA						
New Hampshire		X	X	X	X	X	NA	NA	NA	NA	NA			X			
North Dakota		X	X	X	X	X	NA	NA	NA	NA	NA						X
Rhode Island		X	X	X	X	X											
Vermont		X		X	X	X	Unlikely	NA	NA	NA	NA						
Wisconsin		X	X	X	X	X		NA	NA	NA	NA			X			X
Arizona	X		X	X									X				
California				X			X		X	X	X		X			X	
Connecticut			X	X									X				
Delaware			X	X							X		X				
Florida	X			X	X		X	X		X	X		X		X	X	
Georgia				X			X									X	
Idaho	X		X	X				X	X		X		X				
Illinois				X			X	X	X		X	X	X	X	X	X	X
Indiana				X			X	X	X	X	X	X	X	X*		X	X
Kansas			X	X	If diploids	If diploids	If diploids	If diploids		X	X	Recommended	X		Commercial harvest & state agencies		
Kentucky				X			X					X	X			X	X
Louisiana				X			X	X	X		X	X	X	X		X	X
Nevada				X			X					X	X				
New Jersey				X			X				X		X				
New Mexico				X			X		X				X			X	
New York				X			Not allowed		X	X	X	X	X			X	X
North Carolina	X			X			X				X		X		X		
Ohio	X		X	X								X	X				X
Oklahoma	X			X			X					X	X		X		X
Oregon	X			X			Unlikely						X		X		
Pennsylvania			X	X									X				
South Carolina				X			X		X	X	X	X	X		X		X
South Dakota				X			X						X				
Tennessee	X			X			X						X				
Texas			X	X								X	X	X	X		X
Utah	X		X	X									X				
Virginia			X	X								X	X				X
Washington			X	X									X				
West Virginia				X			X										
Wyoming			X	X			X	X	X		X	X	X				X
Alabama										NA			X				
Arkansas							X						X				
Colorado	X		X (West)	X (West)			X		X		X	X	X				
Hawaii							X					X	X				X
Iowa													X				
Mississippi	X						X	X					X				
Missouri													X	X*			
Nebraska							X						X	X*			

NR = Not Recommended

NA = Not Allowed

Unlikely = permit application allowed, but unlikely to be granted

X* = combined Asian carp

Each state was questioned about which activities were prohibited in their state: grass carp possession, diploid possession or stocking, wild-caught grass carp possession or if they followed a catch and release program. Approximately 60 percent of the states reported that possession of diploids is allowed for research or aquaculture facilities that produce triploids. The rest of the regulations matched the state's ploidy stance where red states prohibited most grass carp activities, yellow states prohibited diploid activities and green states allowed all activities. Many, but not all, of the yellow and red states have grass carp or diploid grass carp on their ANS list.

State resource agencies were asked if there were any other agencies involved in the regulation of grass carp in their state. Multiple regulatory agencies for grass carp were found in 16% of the red states, 30% of the yellow states and 25% of the green states. This is the case in states where the department of agriculture regulates production but the department of natural resources (or equivalent) regulates other aspects of grass carp triploid certification, shipping and stocking.

The states had different permitting and reporting requirements. State responses were compiled with respect to activities that require permits along with which types of records are requested. Permits and reporting activities were not applicable for the red states since grass carp are not allowed in those states but a few states still had some protocols in place regarding commercial fishing. For the yellow and green states, some of the most common requirements include license or permit requirements for grass carp producers, permit requirements for stocking grass carp and USFWS triploid grass carp certification. Some of the other regulations include reporting commercial grass carp caught, submitting proof of USFWS certification and requiring a permit for importation. Four red states indicated that a permit application was technically allowed based on written regulations but upon receipt at the state agency, the permit would be denied.

4.2.3 SOPs and BMPs

State representatives were asked about SOPs and BMPs utilized by producers and distributors that sell or ship grass carp to:

1) Prevent the contamination of diploid grass carp in triploid shipments; or
2) Prevent the introduction of diploid or triploid grass carp in water bodies where either is prohibited.

Table 1 outlines which states have SOP and BMP requirements. Green states do not have state level SOPs and BMPs to separate diploids since these states do not classify diploids as a prohibited species. Based on interview responses, only seven yellow states have some type of SOP, BMP or Hazard Analysis and Critical Control Point (HACCP) recommendation or requirement. This may be in the form of permit requirements for site facilities and operations or a guideline that facilities must develop SOPs, BMPs or a HACCP. One state provides HACCPs for aquaculture facilities but is not sure if the facilities abide by them. Another state has strict site requirements and higher permit fees if facilities don't abide by them. Upon request of examples, most of the states indicated that grass carp facilities should be contacted directly in order to get a copy of SOPs, BMPs or HACCPs due to proprietary issues or the fact that they don't have a copy readily available to provide. No centralized collection of plans was noted by the states, unless they were in the form of permit requirements.

J.M. Malone and Son, Inc. provided Production Protocol and Best Management Practices (**Appendix E**) for certified triploid grass carp production for their facility and are very specific as they describe in order the procedures that are to be followed. The protocols and BMPs for this

facility, along with the NTGCICP "Standards", could be used as templates for other facilities as they are developing their SOPs and BMPs.

Arkansas also provided their Baitfish Best Management Practices guidelines that could be used in the development of other pond facility BMPs. This BMP is specific for exclusion of Gambusia (**Appendix E**).

4.2.4 Inspections/Enforcement

Representatives from each state were asked questions regarding their inspection and enforcement protocols. **Table 1** provides a summary of whether a state requires manual inspections or has enforcement protocols while **Figure 7** illustrates the number of states that meet those criteria.

Figure 7. Number of States with Manual and Enforcement Protocols

For purposes of this report, a manual inspection is defined as a field inspection of a grass carp shipment en route. This type of inspection is different than the ploidy testing and inspections that are part of the USFWS NTGCICP. During the field inspection, the distributor's paperwork and tank tagging would be inspected to make sure that state regulations were followed. In rare cases, ploidy testing is conducted. Thirty-seven states had no inspection requirements and only 13 states (26%) require either random or planned inspections. The type of inspection (i.e., random vs. planned) varied amongst the states that conduct inspections.

The number of states with defined enforcement protocols for illegal acts of grass carp introduction was almost half (48%). The protocols varied by state and included fines or legal action for producers or distributors that do not follow the respective state's grass carp regulations. A common theme was that some states do not have staff to provide enforcement.

4.2.5 State Facility Production

Six states reported state-owned facilities that produce or hold grass carp. Four of those states contain more than one facility for a total of 16 state-owned facilities (**Table 2**). With the exception of California, the facilities are located in states that allow diploids. Seven of the 16 facilities are producing diploids.

The state facilities in Colorado are located on the eastern slopes and obtain a limited amount of diploid fry from Arkansas for use as vegetation control at warm water hatcheries. The state facilities in Alabama purchase USFWS certified triploid fingerlings for grow-out. The state facilities in Mississippi use a process to produce triploids but do not certify or test the fish because they are not equipped to do so and cannot justify the cost of equipment.

Table 2. State Facility Production

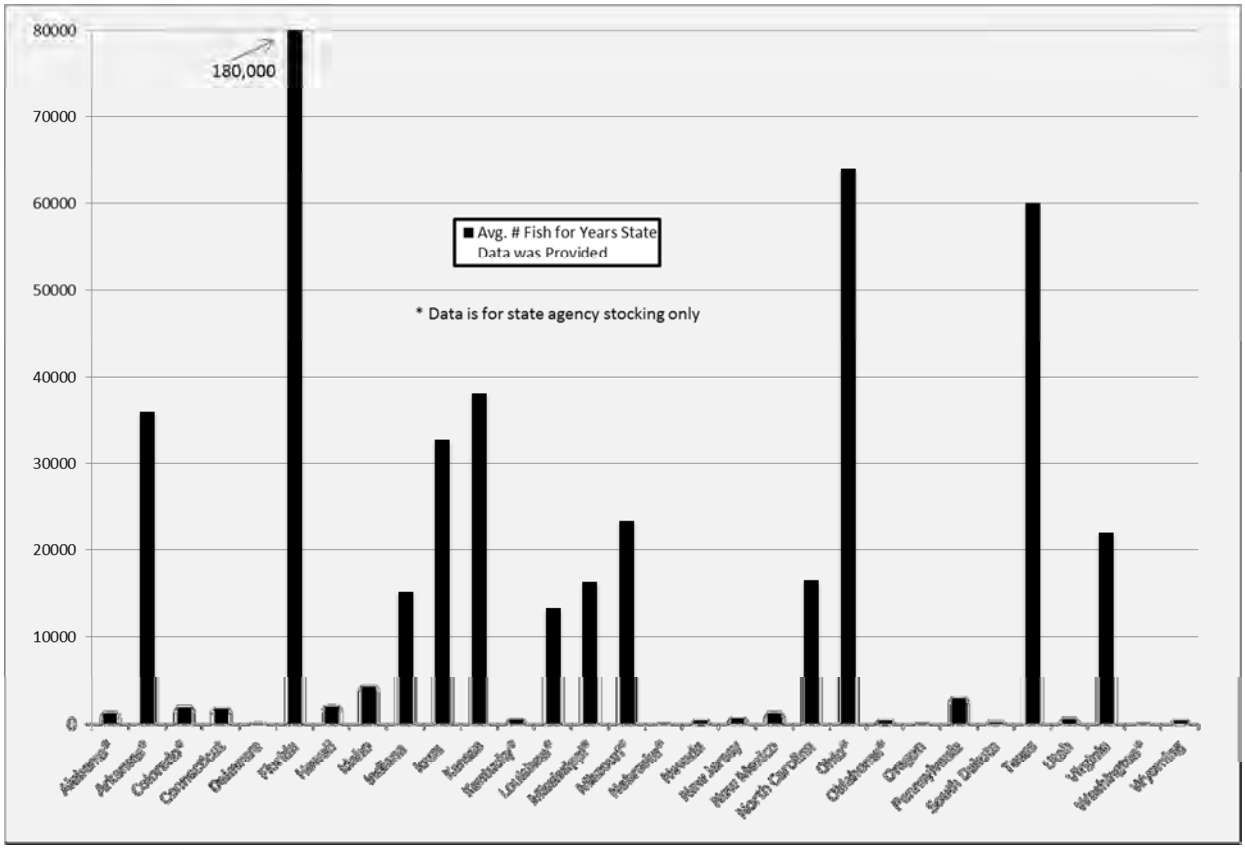
State	# State-Owned Facilities
Alabama	3
Arkansas	6
California	1
Colorado	3
Mississippi	2
Missouri	1
Total	16

4.2.6 Stocking Records

Grass carp stocking records, public or private, are collected by 34 states. State stockings are tracked by 25 states and private stockings are tracked by 26 states. Records were requested by HDR for the past ten years and received from 30 states. The remaining states either kept no records or were unable to provide them; the 12 red states do not keep stocking records since grass carp are prohibited. It is important to note that stocking records do not differentiate between diploid, triploid, state certified or USFWS certified triploid grass carp. **Appendix C** indicates the type of records that were requested, which were received for each state and the reason why they were not provided, if applicable.

The grass carp stocking records collected and provided by 30 states are compiled in **Figure 8** below. It is important to note that the total stocking numbers sometimes include both the private and public stockings but not always. The records that included state agency stocking numbers but not private stocking numbers are noted as a data gap on **Figure 8** by an asterisk for that state. Presentation of private and public stockings separately wasn't feasible due to the issues listed below:

- Records may be combined for the states that have both public and private facilities.
- Some states only provided public stockings.
- Some states only provided private stockings.
- Some states provided no records.



Source: State Agencies, 2013

Figure 8. Average Grass Carp Stocked Annually per State

Based solely on state records received, Florida stocks the most grass carp on an annual basis, followed by Ohio and Texas. Arkansas, Iowa and Kansas all stock an average of about 35,000 grass carp per year. Eleven states stock less than 1,000 grass carp annually. Average values were calculated using the provided annual data from 2002 through 2012. Some states only provided a few years of data while others provided data for the entire range. Averages were calculated using the specific number years provided. Based only on records provided, less than 20% of grass carp were stocked in green states. However, it is important to note that this number is likely low since private stocking records were only provided by three green states.

4.2.7 Disposition

4.2.7.1 State Summary

The disposition of grass carp stocked was requested from each state during the interview process. A total of 30 states supplied their stocking records and dispositions were compiled (**Figure 9**). Disposition data for the remaining 20 states were not available since records weren't received and may not exist. Furthermore, about 20% of data was obtained from the states at the county level, but was not included in **Figure 9** as specific dispositions were not given. As discussed above, separating the state stocking records and public stocking records didn't provide an accurate representation of the dispositions in each since the records could not easily be divided into those categories.

The grass carp dispositions were separated based on ploidy requirements. While not a confirmed representation of diploid and triploid grass carp dispositions, this is the best way to estimate the possible diploid and triploid dispositions since that specific data was not available. The most common dispositions for grass carp were ponds and lakes based on stocking records provided by each state. In both the green and the yellow states, dispositions to ponds and lakes make up for approximately 47 to 61%. The remaining categories could potentially fall within the broad lakes or ponds categories, but due to different record keeping within the states, it was not possible to confirm this. It is likely that the differences in dispositions shown below are due to differences of reporting between states, and not due to different dispositions of grass carp.

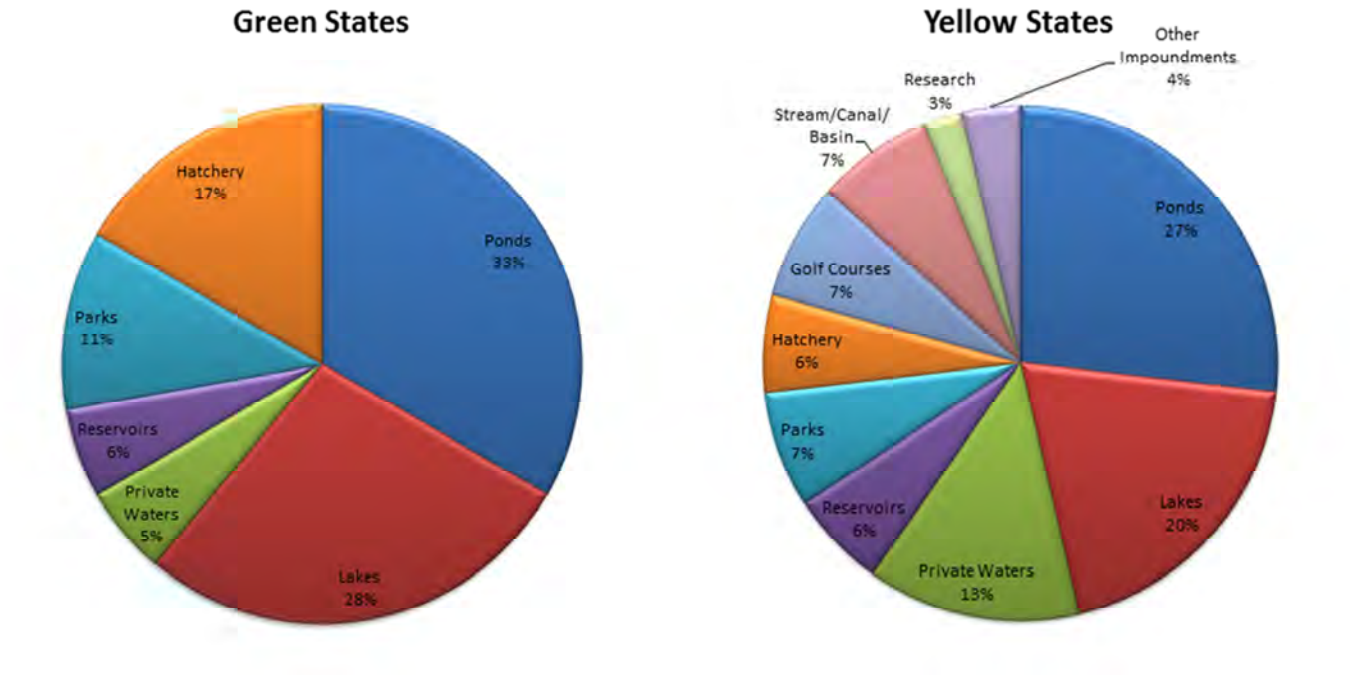


Figure 9. Dispositions of Grass Carp Commercial Fishing Summary

Commercial fishing for grass carp occurs primarily in the Midwest since that is where populations are established (**Figures 2 and 3**). Records for grass carp caught by commercial fishermen are not readily available to analyze for reasons presented below. There are some parameters that don't allow for record keeping in commercial fishing:

- Do not allow commercial fishing
- Do not have any occurrences of grass carp by commercial fishermen
- Do not require fishermen to keep records of commercial catch
- Require records but carp records are generalized

A summary of state commercial fishing protocols is provided below.

Commercial Fishing – Red States

Most states that prohibit grass carp have done so for a long time, and as a result do not keep commercial fishing records for grass carp because the attitude has been there are no grass carp present in their state. This applies for Alaska, Maine, Massachusetts, Montana, New Hampshire, North Dakota and Vermont. In Rhode Island, records are not kept because commercial fishing is not allowed. While some states don't keep official commercial fishing records for grass carp, they may still have instances that grass carp have been identified. Commercial fishing records or occurrences were received from Minnesota, Wisconsin and Michigan. Several responses regarding protocols for when grass carp are caught in prohibited states are provided below.

- Maryland: DNR recommends keeping and killing grass carp encountered. Some commercial fishermen may not recognize grass carp and discard it, but catching grass carp is uncommon.
- Michigan: Records of occurrences are kept. Fishermen are instructed to put the fish on ice and call DNR if the fishermen suspect they have a grass carp. Some fishermen are authorized to euthanize and bury grass carp. Michigan DNR meets annually with commercial fishermen to discuss grass carp protocols.
- Minnesota: DNR requires any Asian carp caught to be reported to them.

Grass carp have been caught by commercial fishermen in Minnesota since the early 1990s but were sparse until flooding occurred in 2008. Totals for grass carp caught in the Mississippi River in 2009, 2011 and 2012 were 562, 10 and 59 pounds, respectively. Records do not indicate whether the grass carp are diploids or triploids.

Records were received in excel format directly from Wisconsin DNR for grass carp caught in Wisconsin within the Mississippi River. From 1991 to 2007 and in 2011, around 300 or fewer pounds of grass carp were reported but this number increased to an average of about 2,000 pounds during 2008- 2010. Specifically, pools 6 and 8- 11 contained the most. Major flooding that occurred within Iowa in 2008 that may have transferred grass carp into the Mississippi River was noted in the records as a possible reason for the increase. Records do not indicate whether the grass carp are diploids or triploids.

Isolated grass carp occurrences have been documented in Michigan and testing usually indicates triploid grass carp. Specifically, one grass carp was reported in the St. Joe River, one in Marrs Lake and five in Lake Erie. Three of the fish in Lake Erie were confirmed to be diploids.

Commercial Fishing – Yellow States

The following states that only allow triploid grass carp do not keep commercial fishing records: Arizona, California, Colorado, Connecticut, Georgia, Kansas, Kentucky, Nevada, New Jersey, New Mexico, New York, Pennsylvania, Tennessee, Utah, West Virginia and Wyoming. The remaining yellow states had the following comments:

- Delaware, Idaho, Oklahoma, Oregon, South Dakota: no commercial grass carp fishing or grass carp not commonly encountered.

- Florida: Fishermen that catch grass carp are required to put it back in the same waterbody because someone paid to put it there. Removals can be requested and have been conducted in two rivers. This process consists of killing the grass carp and reporting it to the Freshwater Fish Commission.
- Indiana: No column for grass carp required on commercial fishing reporting forms.
- Louisiana: The pounds, species and seller's information are tracked by the buyer when commercial fishermen sell their fish. During the interview, it was indicated that there are about 600 freshwater commercial fishermen.
- North Carolina: Grass carp are harvested and killed by bow fishermen but the state does not keep records.
- Ohio: State records of wild caught grass carp may be available but were not obtained. DNR may add a clause in their laws that would allow commercial fishermen to remove and eviscerate Asian carp.
- South Carolina: It is illegal to catch and transport grass carp. Fishermen must put it back because someone paid to put it there.
- Texas: Wild caught grass carp are sometimes reported as records or reported in commercial landings. The records are usually for dead grass carp. No records were received.
- Virginia: Wild caught grass carp are not allowed to be transported. Wild grass carp caught by the Department of Game and Inland Fisheries have been confirmed as triploid.
- Washington: Commercial fishing for grass carp is prohibited. If there is an incidental catch, it must be released.

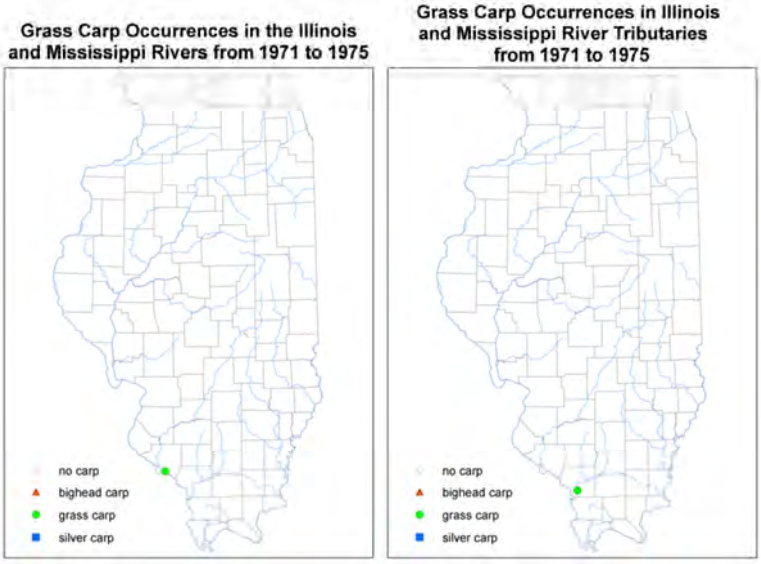
Records were received from the Illinois DNR for grass carp caught by commercial fishermen in six major Illinois rivers as listed in **Table 3** below.

Table 3. Reported Weight (lbs.) of Grass Carp Caught by Commercial Fishermen in Illinois Rivers

Year	Mississippi	Illinois	Kaskaskia	Wabash	Ohio	Rock
2003	58,381	48,203	1,116	210	30	0
2004	58,653	110,764	1,124	0	0	462
2005	34,265	113,987	499	0	1,451	122
2006	40,235	37,484	1,028	400	323	485
2007	73,116	63,851	150	50	0	292
2008	134,912	119,774	1,709	50	103	1,533
2009	256,305	152,723	807	0	2,179	6,506
2010	254,782	198,131	650	235	0	4,364
2011	181,693	231,377	460	920	0	NA

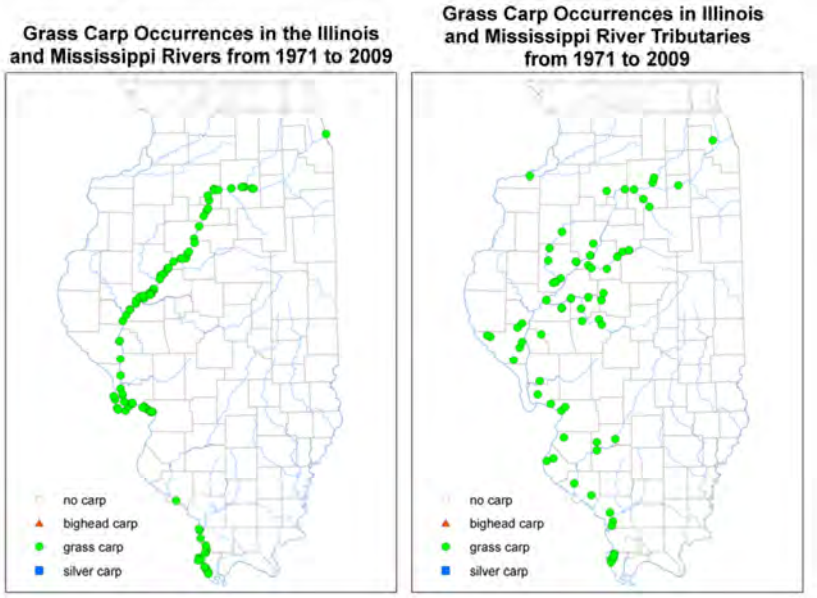
Information provided by Illinois Natural History Survey (INHS) (2013) illustrates the escalating incidence of grass carp in the Illinois and Mississippi Rivers and their tributaries between 1971 and 2009 (**Figures 10A and 10B**). In 1975, incidence was limited to an area in southern Illinois,

but by 2009, the grass carp distribution has spread from the southern end of the state up to the Chicago area. As presented earlier, similar expansion has occurred in other states.



Source: Data from the IDNR, INHS, LTRMP, and Long-Term Illinois, Mississippi, Wabash and Ohio Rivers Fish Monitoring Program, courtesy of Mike Wilson, Illinois Natural History Survey, University of Illinois

Figure 10A. Grass Carp Occurrences in Illinois, 1971 through 1975



Source: Data from the IDNR, INHS, LTRMP, and Long-Term Illinois, Mississippi, Wabash and Ohio Rivers Fish Monitoring Program, courtesy of Mike Wilson, Illinois Natural History Survey, University of Illinois

Figure 10B. Grass Carp Occurrences in Illinois, 1971 through 2009

Commercial Fishing- Green States

Most states that allow diploid grass carp either do not gather commercial fishing records or the records generalize carp with no indication of grass carp. Specific responses obtained during the 2013 interview process for each state are provided below.

- Alabama: There is not much grass carp in the commercial fishing industry, but the state hopes to implement daily catch records in the future for commercial fishing.
- Arkansas: There is no rule to require fishermen to report their catch. The state used to go out and watch them to get a number but they don't do this anymore.
- Hawaii: There are few grass carp present and they are not regulated within the state.
- Mississippi: Commercial fishermen are asked to report what they catch but this is not enforced. Furthermore, the records do not have a column for grass carp.
- Missouri: Commercial records are maintained but not necessarily specific to grass carp.
- Nebraska: Fishermen report their catch but the documentation is poor and may not list grass carp.

Records were received from Iowa DNR for grass carp harvested in the Iowa boundary waters of the Mississippi River. In 2011, a total of 46,962 pounds of grass carp was reported from nine of the eleven Mississippi River pools bordering Iowa. This represented 2% of the total commercial harvest reported in 2011. Pounds of grass carp harvested per year in the Mississippi River since 1987 was also reported. For over a decade, the amount of grass carp harvested was less than 1,000 pounds; however, between 2006 and 2007 the amount increased from 1,169 pounds to 63,400 pounds. The reason for the increase was not reported. The average from 2007 after the increase to 2011 was approximately 35,000 pounds (Jones and Gritters, 2011).

4.2.8 Illegal or Accidental Introduction

The interviews from state agencies revealed potential avenues for illegal or accidental introductions. Nearly all of the yellow states had a comment on how diploid grass carp introductions could occur, including:

- Golf courses stocking diploids.
- Diploids in a triploid shipment.
- Live diploids in the food market.
- Stockings not matching with permits.
- Diploids already present in the wild.
- Supplier or driver trying to make money by selling diploids as triploids.

Additional comments and methods of introduction include:

One of the avenues for possible diploid introduction is when two states adjacent to each other have conflicting diploid/triploid regulations. If one state is triploid only and the other allows

diploid introduction and has a producer or distribution warehouse, there is the direct possibility that an individual from the triploid only state, or from a state that restricts grass carp all together, can or will cross state lines to purchase diploids. This could occur either knowingly or unknowingly of the legal aspects of stocking or transporting diploids. The price differential between diploids and triploids could also induce a pond owner to seek out the diploids and take his chances regarding enforcement.

Another avenue of possible introduction is the deliberate or accidental mixing of diploids and triploids on a shipment of fish across state lines. Although the fish may have been certified triploid from the producer site, the shipment may stop at a diploid producer or at a non-participating triploid producer and accidentally or purposely take on diploid fish. This could and has happened in the past as an Illinois special enforcement effort demonstrated.

There is the potential for introduction of diploids when baitfish are collected from the wild, such as when fishermen use cast nets or minnow traps to collect fish for bait, particularly in areas of established populations of grass carp. These captured baitfish can then be distributed, knowingly or unknowingly, to multiple water bodies to either be used as bait or for deliberate stocking as an aquatic vegetation control bio-tool. Another possible avenue is if a savvy individual knows when to go out and collect fingerling grass carp from the wild, stock into rearing ponds to grow to a larger size and then harvest and sell.

If there is no reporting mechanism or enforcement of reporting for commercially caught wild fish, then there is the potential for movement and stocking of wild caught fish. Even if this activity is illegal, there is always the possibility for "black market" sales of these fish to knowing and unknowing buyers and pond owners.

Of the 41.5 of the states that do not allow diploids, as on **Table 1**, 14 states (32%) have had one or more known introductions of diploid grass carp in a prohibited area. Only 6% of the 41.5 states that do not allow diploid grass carp are taking ploidy samples. The following are recent and past examples of diploid introductions and discoveries that were reported by the states:

- California had an unauthorized supplier selling diploid grass carp to multiple golf course ponds.
- Delaware hasn't had grass carp occurrences of diploids since permitting was put in place (1991), but suspect they had diploids in some golf course ponds in the 80s.
- Kentucky had an instance where an inspection failed. This person lost his propagation license for one year, was fined and all grass carp at the hatchery were confiscated.
- Louisiana had grass carp mixed in a largemouth bass shipment and the truck was sent back to the state lines.
- New Jersey had a grass carp found in the Raridon River and illegal diploid stockings in the Delaware and Wierton Canals. The fish were removed.
- New York had a large number of stockings that didn't match up with permits; ploidy wasn't checked.
- Ohio has had diploid grass carp caught by commercial netters in Lake Erie.
- Oregon has had instances where grass carp have been found outside of where they should be, but ploidy wasn't verified.

- South Carolina has had issues where grass carp have failed the testing at the state facility and instances where ponds were stocked that hadn't gone through the state testing.
- Virginia has had an instance where the entire load was diploid fish. The vendor was kicked out. They had another instance where two fish of the entire grass carp shipment were diploids and all of the rest were triploids. Testing was performed by the state. Retesting was done, and discrepancies from the original testing were identified.
- Maryland indicated that every couple of years a grass carp is found in freshwater or private ponds. Some rivers on the eastern side have grass carp.
- Michigan has had reports of grass carp in both public and private waters.
- Minnesota has had accidental introductions due to possible escapement and migration.
- Montana had a grass carp occurrence in a lake. It was required to be removed.
- Wisconsin has had grass carp at a private fish hatchery and in golf course ponds in the past. They have also had grass carp come in accidently with other fish coming in from the south.

4.3 Private Producers and Distributors

A total of 393 producers and distributors of grass carp was identified from state provided lists, interviews and the internet. A comprehensive list was not provided by Arizona or Louisiana. Most states were able to provide a list of permit holders, a website reference to another entity that compiles a list of fish facilities or a list of approved grass carp dealers in and out-of-state.

Of the 393 producers and/or distributors, HDR was able to reach approximately 73%. This number also includes facilities that do not handle grass carp anymore and those that refused to complete an interview. Long interviews were conducted with 30 private producers and distributors. The remaining producers and distributors were called at least twice in an attempt to reach them for an interview. Short interviews were conducted with those that were willing to cooperate. The number of interviews conducted per state compared with total numbers of producers and/or distributors in that particular state is shown in **Figure 11**.

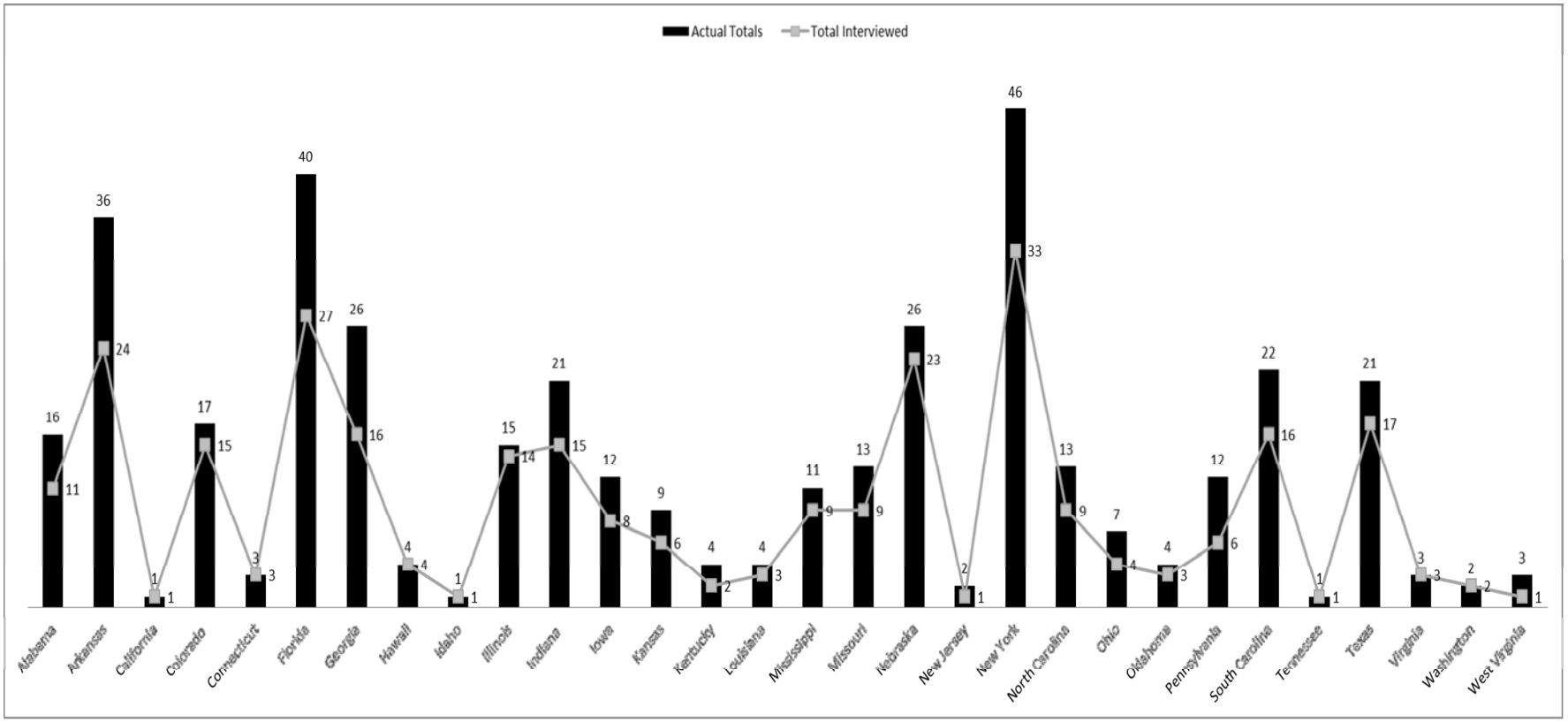


Figure 11. Number of Grass Carp Suppliers and Interviews per State

4.3.1 Categories

Due to the complexity of the grass carp business, there are many different types of private grass carp production and distribution facilities. For purposes of this report, the following classifications were developed and approved by MICRA to provide consistency in the analysis and discussion of the data. The three main categories include: Producers, Grow-Out Facilities and Distributors. Distributors were broken further into several different types for clarification.

Producer- Holds broodstock at their facility, spawns grass carp and grows them to a larger size at their facility

Grow-out Facility- Purchases fry or fingerlings (i.e., routinely holds fish for more than 30 days)

Distributor

Facility Distributor

Holding Facility- Hold live fish in a facility and sell them for profit to individuals who come to the facility or request a mail delivery
Food Fish Market- Hold live or dead fish and sell them for a profit to individuals for consumption

Truck Distributor

Distributor without Facility- Purchase and transport live fish and sell them for profit to predetermined customers
"Fish Truck"- Purchase and transport live fish and sell them for profit at local feed stores, co-ops, etc. without predetermined customers
Warehouse- Purchase and transport live fish, sells them for profit and occasionally holds fish for truck distribution only
Food Fish Distributor- Hold and/or transport live or dead grass carp and sell them for profit to food fish markets or other food distributors/processers

Truck Distributor with Holding Facility- Purchase and transport live fish and sell them for profit to customers that request a site delivery and hold live fish in a facility and sell them for profit to individuals who come to the facility

Fish Day Facility- Conservation Agencies and Home Supply stores provide a location for a distributor to hold one day fish sales. Not officially a distributor but numbers were tracked since some hold a permit or license.

Data to document each type of private producer and distributor for each state was generated using information from the interviews. The results were more challenging to report effectively due to the many types of facilities and different information gathered for each type. Data for all the states was compiled to determine total percentages of private grass carp facilities (**Figure 12**).

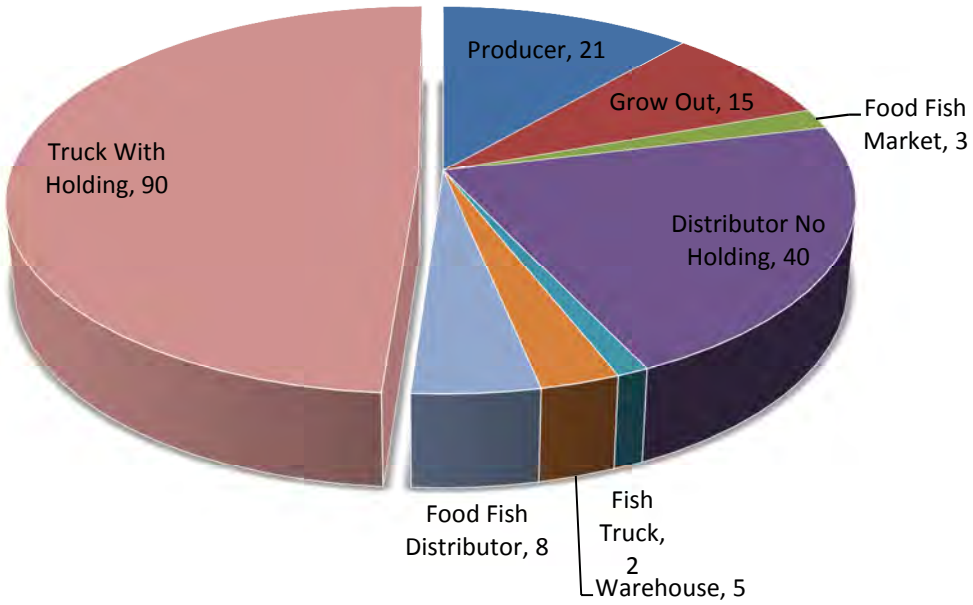


Figure 12. Types of Private Grass Carp Facilities

Almost a quarter of the 393 facilities were reported as no longer in the grass carp business. Specifically, of the private facilities contacted, 65 have gone out of business and 37 are strictly locations where one-day fish sales are held (e.g., Farm and Home and Soil and Water Conservation District). Fourteen producers and 15 grow-out facilities are also distributing fish but are not included as distributors in **Figure 12** in order to avoid double-counting. Of the distribution types, the categories *Truck with Holding* and *Distributor No Holding* contained the largest numbers of facilities. A template that was used to facilitate the interviews and a summary of distributor types that were interviewed are provided in **Appendix B**. At least one facility in each category was interviewed. A summary of the information gathered is provided below.

4.3.2 Rules and Regulations

Rules and regulations for private grass carp facilities are dictated by the respective state agencies and the NTGCICP for those that participate. These were discussed previously; however, a few specific interview questions provided insight on how rules and regulations are carried out and enforced.

Seventeen of the 30 producers or distributors asked indicated that they have SOPs or BMPs in place to contain and prevent diploid contamination during both production and hauling, but most don't have written documentation and explained they have staff meetings on some recurring basis to go over production procedures. It should be noted that verbal communications are not a replacement for formal written BMPs and SOPs that should be reviewed frequently and revised as necessary.

Based on the long interview process, 17 of the 30 people interviewed indicated that their facilities or trucks have undergone state inspections at some point throughout the lifetime of their operations. The inspections help to ensure that producers and distributors follow operational guidelines and meet overall program requirements.

4.3.3 Production and Distribution

Of those interviewed, 136 (47%) indicated that they distribute in-state and 44 (15%) indicated that they distribute both in-state and out-of-state. In terms of buyers, some distributors arrange buyers prior to obtaining the grass carp and some do not. This correlates directly to the size and type of operation. For instance, a truck distributor or fish day facility would only want to order the number of fish they can deliver to a pre-arranged customer because they have no holding facility for the grass carp that are not sold. **Figure 13** outlines locations of the private producers, distributors and fish day facilities.

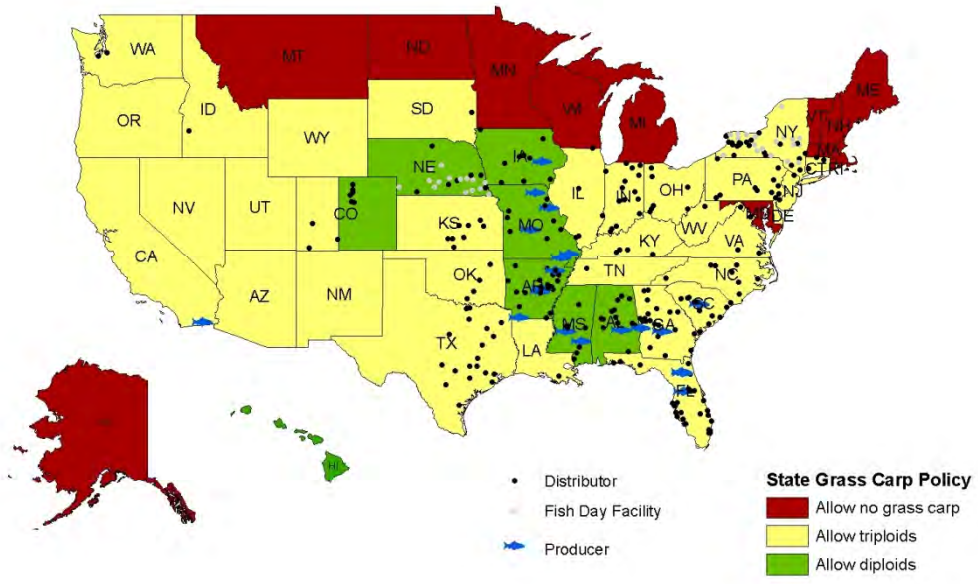
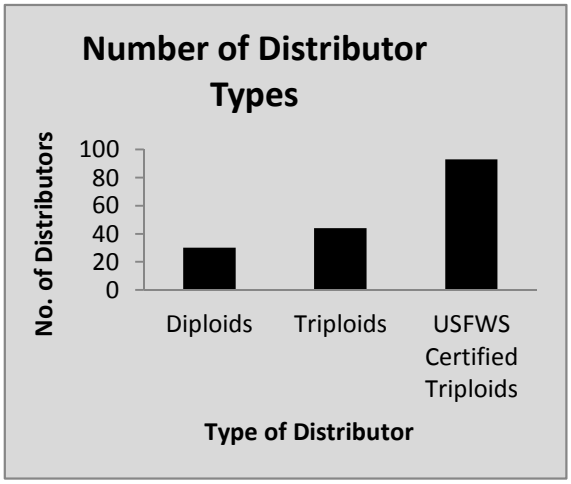


Figure 13. Private Facility Locations

Data indicates that 30 distributors haul diploids, 44 haul triploids, 93 haul USFWS certified triploids and 20 haul more than one type of grass carp. Kentucky, Oklahoma and South Carolina had distributors that hauled USFWS certified and non-USFWS certified triploids. The remaining 16 distributors that haul more than one type of grass carp were located in green states and hauled diploids in addition to either certified or non-certified triploid grass carp. Approximately 70% of those that haul more than one type distribute both in and out-of-state (**Figure 14**).

A total of 12 site visits to grass carp facilities were made in 2013. The purposes of the site visits were to witness operations and determine whether the facilities were employing SOPs or BMPs to keep diploids and triploids separate, if applicable. Representative sites were chosen based on the following criteria:

Figure 14. Distributor Types



- **Recommendation:** During our interviews with state agencies, we asked if they had any recommendations for facilities to contact or visit based on good practices, unique operations, poor compliance or willingness to cooperate. Some of the producers and distributors were also asked if they had any recommendations. Very few recommendations were provided from state agencies or other producers and distributors.
- **Willingness to cooperate:** Our intent was to only meet with producers and distributors that wanted to cooperate. Some of the facilities agreed to cooperate during the initial interview but declined when they were contacted again to confirm a date. Others declined upon first request.
- **Type of facility/operation (i.e., category and fish type):** Guidelines were provided in the original project scope that indicated the types of facilities where site visits should be conducted. During the course of the study and after categories of grass carp facility types were defined, the site visit list was revised. At least one facility type from each category was targeted for site visits with varying ploidy when possible. The number and type of grass carp facilities visited is listed below. Some sites qualify as more than one type.
    - Producer (3 triploid and 2 diploid)
    - Grow-out (2 triploid and 1 diploid)
    - Truck w/ holding (1 triploid and 1 diploid)
    - Holding Only (1 triploid and 1 diploid)
    - Warehouse (1 triploid)
    - Food fish distributor (1 triploid)

    However, it was decided that minimal benefit would be gained by visiting a distributor with only a truck, a fish day facility or a food market which requires dead fish upon arrival. A visit with a truck only or fish day facility would only be beneficial if truck loading, fish deliveries or sales could be witnessed. This was not practical given the strict times of these operations and privacy issues. It was challenging to find a food market with live grass carp to visit. Several of the food markets are located in Louisiana but fish are required to be dead upon arrival so there would be no benefit to visit. Several other food markets were identified in Chicago, but communication was poor due to language

barriers and the fact that Illinois has recently passed a law that grass carp are to be certified triploid if in the food market.

- **Location:** Five states were identified in the original scope: AR, IL, MS, CO and SC. A trip was planned to Colorado but did not occur due to flooding at the time of the proposed trip. The trip to SC was taken out of the study because it was feasible to obtain good information over the phone from both the state and the only producer in the state. Additional Midwest states were chosen (MO, IN, KY, AL) based on the fact that most of the producers are located in the Midwest, including most of the states that allow diploids and have split operations.

After taking all the factors into consideration, 12 sites were visited to perform visual review of the different types of facilities. **Figure 15** outlines general locations of all the facilities.

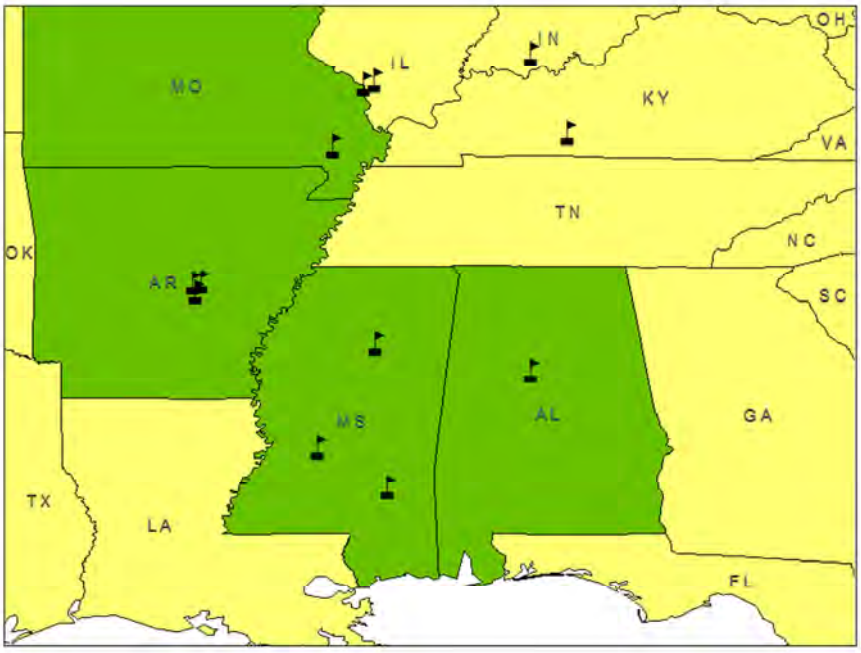


Figure 15. Locations of Site Visits

4.3.3.1 Non-NTGCICP Facilities

Upon arrival, the facility was observed and an interview was conducted. The size, structure and location of grass carp facilities greatly vary. For instance, some facilities had multiple ponds, multiple raceways and multiple semi-trucks for hauling. Other facilities only had ponds or raceways and only one small pick up truck for hauling. One of the major differences is that some producers/distributors hold grass carp year round on a consistent basis and others only obtain them on an as needed basis and temporarily place them in a cage or holding tank.

The largest operation had a well established facility whereas the smaller distributors typically operate from their residence with a small shed or out-building for their grass carp operations. All of the facilities visited in Indiana, Mississippi and Alabama were very small and often adjacent to residences. One diploid grow-out facility was identified for a site visit through the interview

process. At the time of the scheduled site visit, the owner was unavailable but a fish truck was present in the driveway. The location was a residence and no production or holding facilities were observed.

4.3.3.2 NTGCICP Facilities

Site visits were conducted at three triploid production facilities and two triploid grow-out facilities to review and observe their triploid grass carp management, sampling and testing protocols. All five facilities are part of the USFWS certification program and subject to producer standards as referenced on the USFWS website. Photo documentation was allowed at each facility of their operations and procedures (**Appendix A**). Testing procedures were similar for testing and handling, as each used a Coulter counter to test for ploidy and maintained separate holding tanks for the presumptive triploids and diploids with each tank labeled as specified by the NTGCICP.

One production facility utilized seven staff during their initial ploidy testing process. Their procedures required that when a test revealed a diploid, that the proper fish was identified and removed with multiple staff witnessing the event, in addition to having video back up. All testing activity would cease allowing all staff to witness the identification and removal of the proper fish and to place it into a separate "diploid only" tank. Also, the Coulter counter operator would work at their station for no more than one hour with an observer watching and verifying those operations. At the end of one hour the observer and Coulter counter operator would switch places.

Two other production facilities utilized four staff during ploidy testing, including their Coulter counter operations which were conducted by the Manager/Owner rather than hatchery staff. These two facilities did not use video observation. The two grow-out facilities had much smaller operations and inspections were carried out by one person with one assistant to help transfer fish.

The facilities in the USFWS program followed similar procedures to keep the fish separate, from the time they were harvested from the pond to the final holding tank after testing, following USFWS protocol. Signage was utilized by each facility to identify the tanks for "Untested Fish from Ponds", "100% Producer Tested Presumptive Triploids", "USFWS Certified Triploids", and "Diploids".

4.3.4 Stocking Records

Most producers and distributors keep sales or stocking records but some do not. We asked some of the producers and distributors if they would be willing to provide stocking records. No facility provided their sales or stocking records for various reasons, ranging from proprietary to all records were hardcopy and stored in boxes. Therefore, the most comprehensive stocking records can be found in the state stocking records section.

4.3.5 Disposition

Producers and distributors were asked to provide the disposition of their grass carp. The primary disposition reported was private ponds. Some indicated state agencies or public waters. Although the producers and distributors were not willing to share their sales or stocking records with HDR, the disposition of grass carp previously discussed included some records for private facilities as supplied by the state agencies.

Distribution of grass carp to the food market is minimal, with the exception of a few states in which the grass carp are dead upon arrival at the market anyway. Based on our findings, the food market does not appear to be a major vector for accidental or illegal introduction.

4.3.6 Illegal or Accidental Introduction

The interviews from producers and distributors identified potential avenues for illegal or accidental introductions. There were a variety of comments on diploid grass carp introductions to the triploid chain. The following are avenues that were suggested during interviews. Additional suggestions were identified during comment review of the draft report:

If a production facility does not follow established protocol developed by the NTGCIP keeping tanks with certified fish signed, adequately space separated, and covered, there is the possibility for contamination either by jumping from tank to tank or accidental movement and introduction from one tank to another. There has even been suspicion of deliberate movement and introduction (sabotage) of fish at a facility.

Once a shipment leaves with a certified load, it has been suggested that those shipments can become contaminated with diploids when that truck stops at a diploid producer and happens to mix fish within tanks from that diploid producer to meet quota. There is suspicion among some producers and distributors that these activities have occurred and may still be occurring.

Failing to have and to enforce facility and distribution SOPs and BMPs can be a source of failure, particularly if employees are not educated and reminded on a frequent basis that not following established protocols can result in contaminated triploid populations.

If an inadequate job of screening and separation when harvesting a pond of another species that has had grass carp introduced for vegetation control or polyculture, then there is a possibility for introduction of grass carp at time of stocking.

It has been suggested that stockings have occurred when the shippers don't know regulations of a particular state either due to a change in regulations or just ignorance of the regulations.

There is always the possibility of unplanned introduction during flood events or screening failures. This has occurred in the past.

Lack of state inspection and enforcement, or an oversight mistake by a state inspecting agent not to identify a previously issued, and now expired certificate may result in the stocking of diploid grass carp if that shipper/distributor tried selling diploids in place of triploids.

5 Data Analysis

Due to the complexity of the nationwide grass carp industry, answers from interview questions with states, distributers and producers were not always provided. It should be noted that discrepancies were identified due to differing answers provided during the process. HDR's data results are only as accurate as the information that was provided to us from the interview process. Information was cross referenced with the information that we were given to the best of our ability.

5.1 State Regulations

Grass carp policies are not consistent across the United States. Policies range from no regulations in place to inspection of every shipment entering the state. At least 11 states have the ability to produce and distribute grass carp without regard to the NTGCICP due to lack of regulations or

exceptions for inter or intra state movement. It was also noted during review of this document, that the Interstate Commerce Commission protects the shipper/distributor from enforcement action when hauling species across state lines and through states that have classified those species as illegal as long as that shipment does not stop and distribute those species within that state. Furthermore, some states, even those with regulations, are not fully knowledgeable about the grass carp industry within their state. In more than one case, interview responses from state agency representatives were conflicting on whether or not triploids were required. This lack of consistency leaves all states vulnerable to accidental and illegal introductions of diploid or triploid grass carp where prohibited. As an example, Tennessee regulations state that triploids are required; however, responses from three different interviews (state and private) included: triploids are suggested but not required, triploids are required but do not have to be certified and triploids are not required. Upon comment response, it was clarified by the state that triploids are required and this was echoed by a private producer. There is obvious confusion over the regulations in this particular state which could easily lead to accidental introduction by distributors that do not clearly understand the written regulations. Multiple green states have made an attempt or have a desire to prohibit diploid grass carp but have been unsuccessful in making a change. The following challenges were reported:

- Resistance from the private industry.
- Cost of equipment and certification.
- Lack of regulations in surrounding states.
- Difficulty approving new regulations.
- Need for revised regulations and enforcement.

5.1.1 Multiple Regulating Agencies

Due to varying classifications, grass carp are regulated by different types of agencies or divisions in each state. For instance, in red states which completely prohibit grass carp, grass carp regulations are carried out by the ANS division of the state natural resource agency. In green states which allow diploid and triploid grass carp, regulations are carried out by state agriculture agencies. In many of the yellow states, regulations are carried out by more than one agency because diploid grass carp may be on the ANS list, but triploid grass carp are allowed for propagation or stocking. This creates disconnect between agencies and/or divisions that may have very different missions at a larger scale and makes it difficult to come to consensus regarding grass carp policies.

5.1.2 Inspection and Enforcement

The presence or absence of inspection and enforcement policies varies by state (**Table 1**). Currently, the regulations and rules for transport of grass carp within triploid states are stricter than diploid states, which is to be expected. Inspection protocols for fish shipments en-route range from no inspections to inspecting every shipment. Inspections are occurring in only 13 states. Enforcement protocols also vary by state and are established in 24 states. These numbers represent an overall lack of inspection and enforcement, which leaves the door open for accidental or illegal introductions. One of the reasons for lack of inspection and enforcement is that not all states have staff or budget for these activities and another reason is that regulations are not in place, which makes inspections and enforcement unnecessary. It was also reported that unwanted introductions of grass carp do not occur in all states, which may negate the need for inspection and enforcement.

5.2 Grass Carp Facilities

5.2.1 Data Gaps

Producers enrolled in the NTGCICP were cooperative. Other producers and distributors were sometimes difficult to work with but interviews were conducted for approximately 70% of the documented producers and distributors compiled from readily available lists. Cooperation issues included refusal to have a conversation and refusal to complete interviews. About 15 facilities didn't want to take the time; some had concerns over providing responses to MICRA or USFWS, or were fearful of additional regulations that would come out of this project. Resistance was also received when trying to find facilities that would allow a site visit. While some said "no" right away, other owners agreed to a site visit ahead of time but changed their mind prior to the visit or were unable to be reached at the time of the visit. It was not surprising to encounter resistance since we were contacting people that did not know us and were not familiar with our study. Despite the small number that did not want to cooperate, the majority of producers and distributors were helpful and provided insights on their operations.

5.2.2 Types and Numbers of Facilities

The types of facilities and operations within the grass carp industry are very complex. With only 18% of the grass carp facilities identified as producers or grow-out facilities, the vast majority of grass carp facilities are distributors. Since distributors are not a part of the NTGCICP and producers voluntarily participate, only about 3% (9 of 291) grass carp facilities participate in the NTGCICP. The fact that distributors are not all held to standards, or even permitting and licensing requirements in some states, is a concerning issue. It is important to note that at least 15% of the distributors are operating both in and out-of-state. Just over 50% of the distributors use a holding facility for their operations which requires additional transfer of fish. In summary, the small number of facilities that produce USFWS certified triploid grass carp, the distributors operating out-of-state and the distributors that use a holding facility are all risks for accidental or illegal introductions or grass carp. In states that have strong regulations in place, the risk is greatly diminished.

5.3 SOPs and BMPs

On a national level, there is a lack of written protocols in use to prevent diploid and triploid grass carp from states where they are prohibited and copies of any plans that do exist were not readily available. However, J.M. Malone and Son, Inc. did provide excellent examples of working protocol and BMPs for their operation that has been included (**Appendix E**). Without written and frequently reviewed SOPs and BMPs there is the possibility for illegal and/or accidental introductions (particularly if there is turnover in employees) of diploid grass carp either by distribution/stocking or facility escapement. Based on data gathered during this study, SOPs and BMPs typically originate from NTGCICP producer "Standards" and state permit requirements for facilities. Although almost half of the producers and distributors reported use of SOPs or BMPs, most of the SOPs are communicated verbally to staff since grass carp facilities are often small, family-owned businesses with very few employees. For example, all distributors indicated that grass carp are kept in separate tanks during transfer. Implementation of producer standards were observed during site visits with producers in the NTGCICP. As stated earlier, very few written SOPs or BMPs were provided by grass carp facilities, especially distributors.

5.4 Grass Carp Records

5.4.1 Data Gaps

Confidentiality issues, unfulfilled FOIA requests, non-compiled records and non-electronic records created data gaps in stocking records and number, type and location of grass carp facilities. At the time of the report printing, information was not received from three states and was not available for an additional four states since they do not maintain electronically compiled state-wide stocking records. A summary table of information that was requested and received from each state is included in **Appendix C**.

Data analysis was performed using records and information received but assumptions were made in the process. It is difficult to substantiate conclusions when data gaps are present but enough data was available to provide general conclusions regarding the grass carp industry as a whole. Specific comparisons related to diploid and triploid grass carp were difficult since none of the state records separate the two.

5.4.2 Stocking vs. Certification Records

States and private facilities do not share common record keeping methodologies. As listed in **Table 1**, some states keep no records of grass carp stocking or importation, some states keep either public or private records but not both and some states collect commercial fishing records but do not have a separate column to obtain precise numbers for grass carp. However, as part of the NTGCICP protocol, a copy of each triploid grass carp certificate issued by the USFWS is immediately transmitted by FAX, email and/or USPS to a designated state employee in the state that the certificate is issued for. States may require triploid certification but may not record the actual certification records.

Due to the lack of consistency in state recordkeeping, the data obtained from USFWS for certified records did not always match data obtained from each state. **Figure 16** illustrates the disparities in the data for the yellow states since red states and green states do not typically stock USFWS certified triploids. The states with an asterisk or double asterisk on the figure represent data gaps which are the reason the records don't match. The most concerning records are those where state records indicated a much higher amount of grass carp stocked than were certified by the USFWS, for instance, Kansas and Ohio. Kansas has recently (2012) changed from allowing diploids to a triploid only state. Also, as another example, one of the largest distributors of triploid grass carp in Ohio sells fish in Kentucky, Indiana and Ohio. This distributor routinely has 50% of the triploid grass carp they purchase certified for Ohio, 25% for Indiana and 25% for Kentucky which may account for some discrepancies in numbers (pers. corr. Freeze 2014). These records should theoretically match and the disparity is greater than what would be caused by inherent error. Florida also had more stockings than certifications reported; however, Florida does not require USFWS certification for intrastate transfer. Indiana, Louisiana, North Carolina and Texas all had higher certification records reported from USFWS when compared to state stocking records. This may indicate a recordkeeping issue or lack of cooperation by distributors but is not too alarming since the certification records were higher than the stocking records.

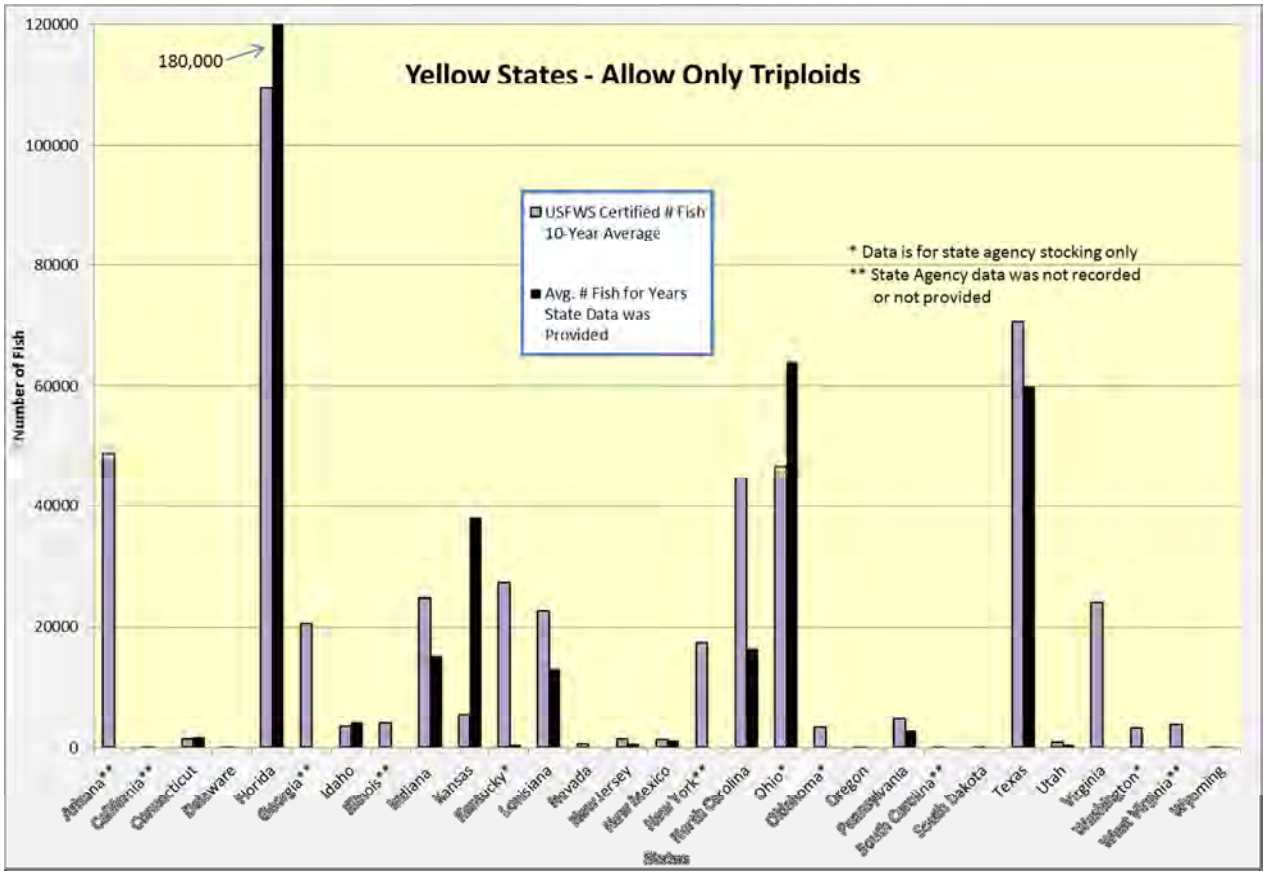


Figure 16. Average Number of Grass Carp Stocked per State

5.4.3 Commercial Fishing

Commercial fishing records are not kept or not species-specific in all states, which represents a data gap. Furthermore, bordering states that share waters may have overlapping records since fish are not bound to political boundaries. In particular, Iowa, Illinois and Wisconsin share a boundary on the Upper Mississippi River, yet each state has differing regulations. Examples of commercial fishing reporting forms from Illinois DNR are included in **Appendix C** that would be good templates for states that might like to develop or update their commercial fishing record keeping.

Records in multiple states showed a huge increase in certain years that can likely be attributed to flood events. There has been reference to escapement of fish into other states during flooding events but elevated rates of reproduction in flooded backwaters could cause just as much of a concern. This is a prime example of the need for inter-jurisdictional management of grass carp. Escapement due to flooding does not appear to be a major concern across the nation since most of the information gathered during interviews revealed that grass carp are primarily stocked in isolated private ponds outside of the floodplain, but this is still recognized as a possible occurrence during high rain events and the fish could escape by way of the overflow into a receiving stream.

5.4.4 Disposition

Approximately 20 to 25% of dispositions were reported for potentially open systems as compared to roughly 50 to 60% for likely closed systems. This means that a quarter of the grass carp stocked across the nation potentially have a pathway to escape or migrate from the waterbody they were stocked in. This is a direct cause of accidental introduction.

5.5 Illegal and Accidental Introduction

Even with the NTGCICP in place, law enforcement agents and state biologists have reported actual cases of diploids in states where transportation permits are required and only triploids are allowed. The previous sections outlined numerous pathways for accidental and illegal introduction, whether perceived or actual scenarios. It is important to note that grass carp could be obtained from rivers and tributaries already populated with diploid grass carp and then stocked illegally into other water bodies. It is interesting to note that some states do not feel that any introductions are occurring within their state; while others are convinced introductions are occurring and have proof such as confirmed diploids in a state where all grass carp are prohibited.

Colorado has an interesting operation since diploids are allowed for stocking in the eastern half of the state, but USFWS certified triploids are required in the western half. They do not feel that this divide has caused unwanted introductions because they have not had any problems with regulating transport; enforcement laws are in place but they haven't had to use them; they keep the private sector well informed.

5.6 NTGCICP

Mudrak (2013) indicated that one of the strengths of the NTGCICP is that producers in the program are operating with a high degree of precision and accuracy. This is a result of requiring every fish to be tested and a subset re-tested, tight Quality Assurance/Quality Control (QA/QC), penalties and incremental costs associated with failures. Inspector and producer expectations and requirements are clearly defined for those that have signed an MOA with the NTGCICP. The program is considered effective in preventing diploid grass carp from leaving a producer's facility as alleged triploid grass carp for producers in the program.

One of the weaknesses reported was that the NTGCICP lacks authority in enforcement of regulations other than penalties for violation of specific producer standards for the nine producers that have signed an MOA. Considering the industry as a whole, the majority of grass carp facilities identified during this study are distributors that are not subject to the standards of the NTGCICP. Given that production of diploids is allowed in 7.5 states, and some producers do not participate in the program, this is an issue of concern related to grass carp control.

6 Alternatives and Recommendations

The primary outcome of data analysis was documenting inconsistencies across the nation in regard to grass carp policies. Three alternatives are provided below for reaching general consensus regarding whether to allow, restrict or prohibit grass carp. The recommended alternative is followed by additional, more specific recommendations but is not intended to be an all-inclusive list. Additions, deletions or modifications may be necessary upon further review.

6.1 Alternatives

6.1.1 Prohibit Grass Carp in All States

One alternative would be to prohibit stockings of diploid and triploid grass carp nationwide. Currently, 38 states allow diploid or triploid grass carp stockings. Prohibiting stocking in all these states would be a drastic change and would require a considerable amount of cooperation and coordination. Current cooperating producers would be negatively impacted and would not be supporters of this recommendation. This would also be unrealistic since established populations are already reproducing.

6.1.2 Allow Grass Carp in All States

For those that view there are no impacts due to grass carp, another alternative would be to allow stocking of grass carp, diploid or triploid without any oversight by state or federal entities. Since there are established and expanding populations of grass carp in several rivers and canals, notably within the Mississippi, Illinois and Red Rivers, the perception by several states is that it is too late to control the presence and dispersal of grass carp. This alternative would not allow protection for states that list grass carp, diploid or triploid, as a prohibited or restricted species because this would allow stocking to occur in watersheds that cross states lines. Without regulations, physical restrictions or reproductive limitations, grass carp will certainly end up in states where they are not wanted and could potentially create economic harm.

6.1.3 Implement Inter-jurisdictional Regulations

The recommended alternative is to implement a complete "national triploid grass carp program" and require all states to become "triploid stocking only" or remain or become "restricted" for stocking of grass carp. The NTGCICP is a primary sub part of that national program, and whereby all states adhere to a minimum of standard regulations, record keeping, and requirements for written BMPs and SOPS. This may require listing of diploid grass carp as an injurious species. Listing diploid grass carp will be met with resistance from the industry in states where they are currently allowed and potential repercussions and hardships should be considered and could prove problematic. Accommodations will be required for producers to hold diploid parent stock for production of triploid stock. The "listing" of grass carp was discussed during the development of the "Management and Control Plan for Bighead, Black, Grass and Silver Carps in the United States" and was rejected. On the other hand, many of the natural resource agencies in these states may support this policy.

States that allow grass carp as an acceptable means of vegetation bio-control should have the same protocols in place to insure there would be no opportunity for stocking of diploids. This will require federal oversight and monetary assistance to make sure all states could/would be able to participate. In addition, opportunity should be afforded to those new producers who might want to become involved in the production of triploid grass carp by offering the technology and training needed to produce triploid grass carp, thereby reducing the temptation to illegally supply diploid grass carp. Further recommendations to be considered are discussed below.

6.2 Recommendations

Recommendations for this report were developed based on information available at the time of this study. Extensive data collection efforts were completed; however, data gaps still exist. While specific recommendations are presented below, additional data collection and more importantly, a forum for federal, state and private entities tied to the grass carp industry will be necessary to

ensure that the impacts of recommendations to private, state and federal entities have been accounted for prior to implementation. This document is NOT intended to create policy, but rather compile and present current policies and make recommendations based on strengths, weaknesses and commonalities of the information gathered.

6.2.1 State Regulations

A truly effective grass carp management program would be one that manages consistencies nationally thus increasing the breadth of the program to include states, producers and distributors and developing consistent rules and regulations among states and at a national level. Standards should exist for state regulators and private distributors in addition to the standards set forth for the producers and inspectors in the NTGCICP. Written expectations would provide states with procedures and/or support to strengthen or establish their state grass carp program. Federal assistance should be provided to states to help them make the regulation changes necessary to reach a level of consistency with other states.

6.2.2 Inspection and Enforcement

Inspection and enforcement protocols should be implemented in all states. Random inspections are more beneficial than scheduled inspections because a distributor may have time to prepare for a scheduled inspection but a random inspection is truly an indication of their typical operations. This recommendation will be difficult to implement since the major reason states don't do manual inspections is lack of funding for additional law enforcement.

6.2.3 Record Keeping

Record keeping should be a requirement for all states as part of a national program that should be submitted annually to a national data base. The reason for these records would be for tracking purposes such as was attempted with this report effort. Examples include annual stocking records (including how many, where and water body type) certification records from USFWS, importation records including where the fish came from and who delivered the fish, commercial fishing records specific to grass carp, and a current list of grass carp producers and distributors that should be updated annually. Data should be entered into a common database that would allow for better sharing and comparison of data, especially between agencies within the same state. Louisiana has developed a good methodology for reporting commercial catch that should be considered in states that have high numbers of wild grass carp. Each fisherman has an assigned card that is swiped upon fish delivery for record keeping purposes. A mechanism to encourage data sharing between states and the NTGCICP would be beneficial and could be in the form of each state requesting certification records for comparison to their own annual stocking records. This may already be occurring in some states since some states review a copy of the certification records from USFWS prior to granting an importation or stocking permit for grass carp and should be implemented by all states.

6.2.4 Summary of Regulatory Recommendations

State regulations for producers and distributors for grass carp facilities were reviewed and discussed previously. The following summary includes items that should be considered for implementation in all states or are particularly noteworthy are listed below. Most of these items are based on excerpts from materials reviewed during this study.

- A state license is required for all grass carp distributors.
- A state aquaculture permit is required to produce, hold or stock grass carp.

- All grass carp producers must have an active MOA with USFWS.
- All state and private producers and distributors must submit annual grass carp records and indicate if the grass carp are diploid, uncertified triploid, state certified triploid or USFWS certified triploid. Records should be uploaded to a state maintained database and should include the ploidy as described in the previous section.
- Each state will request the USFWS triploidy certification for each stocking on an annual basis. This data will be cross-referenced to the permit for stocking that each state requires.
- All grass carp permit and license holders (i.e., producers and distributors) will attend an annual meeting held by the state natural resource agency.
- Each facility that will be producing or holding grass carp must be checked by a state representative once a year and documentation of these inspections uploaded to a database.
- All state and private grass carp facilities must have SOPs and BMPs documented with the state. This may be in the form of permit requirements but should be modified to account for the uniqueness of each facility.
- All inflows and outflows of holding ponds for untested triploid grass carp must be screened to prevent potential grass carp from entering the surrounding waterways.
- All stocking permits will be inspected by the distributor to ensure the correct number of grass carp is stocked. Landowners must maintain a copy of the triploidy certification records.
- All grass carp tanks, cages, raceways or ponds must be segregated and labeled with placards developed by the NTGCICP.
- Producers and distributors must obtain importation permits. USFWS certification paperwork must be reviewed prior to issuing an importation permit.
- No diploid or triploid grass carp stocking will be permitted in any major drainage or water having a connection to any waters of the state or that is subject to flooding.
- No permits will be granted in areas that contain threatened or endangered species.
- Regional or national guidelines for stocking ratios should be developed based on a nationwide stocking analysis.
- When a commercial or recreational fisherman catches a grass carp in public waterways, the fish must be eradicated immediately and reported to the state natural resource agency. This would only be applicable to states that prohibit all grass carp at this time but may be considered for all states in the future.
- State enforcement policies must be in place and carried out when permit and license violations occur.

6.2.5 Education and Awareness

The rules cannot be followed if they are not known. The following key points were identified in relation to education and public awareness:

- Some states don't know who is producing or distributing grass carp, or whether the grass carp are diploids or triploids.
- The terms diploid and triploid are not universally understood. Some of the distributors contacted in states where diploids are allowed were unfamiliar with the terms.
- Not all private pond owners are familiar with the regulations for their state, let alone the surrounding states. If the pond owner doesn't understand the restrictions, there is a potential for accidental or illegal introductions.
- Michigan DEP indicated that knowledge is a key component in preventing illegal and accidental introductions of diploid or triploid grass carp. For instance, after educating the public, officials received a report of a fish truck selling diploid grass carp in a prohibited area. The illegitimate distributor was later caught and prosecuted.
- Colorado Parks and Wildlife reported that they meet annually with grass carp distributors and a well-informed private industry limits unwanted introductions.

An excerpt from the Control Plan is provided below as a recommendation for public outreach.

> Provide information to the public, commercial entities, and government agencies to improve effective management and control of bighead, black, grass, and silver carps in the United States. An effective, nationally coordinated educational initiative is needed to: 1) identify specific needs for information and education; 2) identify the most effective approaches to reach and affect each group; 3) gather and validate the credibility of materials; 4) become both partners and leaders in planning, implementing, and evaluating education initiatives; and 5) identify gaps in knowledge or needs that can be addressed by applied or adaptive research. For greatest effectiveness, each component of an educational program should be developed in a stakeholder participatory process, monitored, evaluated, and adaptively managed (Conover *et. al*., 2007).

6.2.6 NTGCICP

NTGCICP staff noted that the USFWS is moving towards a National Policy to strengthen aspects of the NTGCICP (pers. comm. Mudrak, 2013). The USFWS suggested modification of the Congressional Act to empower the NTGCICP to work with legal private producers and state law enforcement agents in ways that will assist both federal and state law enforcement agents in the prosecution of illegal transport into states or illegal stocking. Narrative and requirements regarding the Policy may be published in the Federal Register in 2014. This process has been initiated but not completed (pers. comm. Wayman, 2014).

7 Conclusion

A national analysis of grass carp regulation, production, triploid certification, distribution and stocking was conducted to determine if the public and private entities producing, certifying, shipping, stocking and regulating grass carp are employing effective and integrated actions to safeguard aquatic resources by preventing accidental or illegal introduction of diploid or triploid grass carp. The conclusion is that effective and integrated actions are not collectively employed across the nation, which leads to an elevated risk for accidental or illegal introduction of diploid or triploid grass carp.

The overarching theme detected during the analysis of the grass carp industry was the nationwide difference in perceptions and operations. Within the cooperating producers stocking grass carp in states with monitored programs, the NTGCICP was viewed as quite effective because of

standardized protocols, procedures, inspections and consequences for accidental or inappropriate stockings of grass carp. However, analyzing the program from the perspective of all 50 states provides a different opinion. With up to three different categories of grass carp regulations present, often between bordering states, the nationwide effectiveness of the NTGCICP program is reduced. A nationally coordinated and federally supported approach is needed to successfully implement an effective, integrated grass carp management program whereby all states participate. A truly effective program would be one that manages consistencies nationally thus increasing the breadth of the program to include states, producers and distributors and developing consistent rules and regulations among states and at a national level. Once a truly "National Program" is in place whereby all states either restrict the stocking of grass carp or only allow triploid grass carp to be stocked, follow established uniform record keeping, and have uniform enforcement from state to state, then the chances of illegal or accidental stockings of diploid grass carp will be minimized. However, no matter what is instituted, there will always be the possibility of "black market" sales and accidental or intentional stockings of diploid grass carp taken from established wild populations by unscrupulous or unknowing individuals.

The USFWS NTGCICP has certified almost five million triploid grass carp for nine producers in the past ten years in order to provide reassurance to triploid states that alleged triploids are not actually diploid grass carp. The effectiveness of this program can be extended, even within states that allow diploid stockings, provided a consistent nationwide message and program are promoted. More awareness of state by state regulations by distributors and the general public is warranted. Without nationwide consistency and management, the effectiveness of the program will be confined within the limits of the few certified producers already in operation. This document preparation and scope, which was managed by a collection of private producers, agencies and state and federal representatives, provided a vital first step in that nationwide consistency by collectively documenting the current operating conditions of each state and program. While nationwide concurrence on the use, effectiveness and risk associated with grass carp is unlikely to be reached quickly, promotion of effective measures through education and improved record keeping can begin immediately.

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A

REPRESENTATIVE SITE VISIT PHOTOGRAPHS

National Analysis
of Grass Carp
(*Ctenopharyngodon idella*)

MICRA Site Visit Photo Log

The following photos are a representation of the site visits. They include photos of raceways, grass carp, ponds containing grass carp, grass carp holdings and different stages of the grass carp triploid testing.


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B

QUESTIONNAIRES - TEMPLATES AND SUMMARY OF PRIVATE FACILITIES

National Analysis of Grass Carp (*Ctenopharyngodon idella*)

Live Grass Carp Shipping, Sale and Distribution Questionnaire

Date:	State:
Company:	Contact:
Phone Number:	E-mail:

1. How many years have you been in the grass carp business?
2. Are you required to have a license or permit to operate from the state you are located in?
3. What procedures are you required to follow to obtain and maintain your state permit to hold /distribute grass carp?
4. What reporting requirements do you have to the state for grass carp distribution within the state?
5. Is there a state agency that monitors your operations and compliance with permit/license requirements?
6. The following are a list of questions regarding your grass carp operations. (Please indicate yes for all that apply)
    a. **Producer**- Do you hold broodstock at your facility and spawn grass carp? (go to producer)
    b. **Grow-out Facility**- Do you purchase fry or fingerlings from another producer and raise them at your facility (i.e., hold them for more than 30 days)? (go to producer)
    c. **Holding Facility Distributor**- Do you hold live fish in a facility and sell them for profit to individuals who come to your facility or request a site or mail delivery? (go to 5)
    d. **Truck Distributor (without a holding facility)** - Do you purchase and transport live fish from a producer and sell them for profit? (go to 6)
    e. **If yes to "c and d" Truck Distributor with Holding Facility**- Do you hold live fish in a facility and sell them for profit to individuals who come to your facility or request a site delivery? (go to 7)
    f. **Contract live hauler-** Do you haul fish under contract from point A to point B? (go to 7)
    g. **"Fish truck" distributor-** Do you load live fish onto your trucks and sell them for profit on a scheduled route at local feed stores or co-ops? (go to 7)
    h. **Food fish distributor-** Do you hold and/or transport live or dead grass carp and sell them for profit to food fish markets or food distributors/processers? (go to 7)
    i. **Food Fish Market-** Do you hold live or dead fish and sell them for a profit to individuals for consumption? (go to 8)
7. What is the most common fish disposition (e.g., private ponds, warehouses, state or governmental agencies or other grow-out facilities)?

8. **Holding Facility Distributor-** hold live fish in a facility and sell them for profit to individuals who come to your facility or request a site delivery (e.g., bait shop, consultant, warehouse/ponds)
    a. Do you sell diploid grass carp, triploid grass carp or both?
        i. If triploid, are they all USFWS certified?
        ii. If not, why?
        iii. If both, what percentage of your grass carp business is diploid versus triploid?
        iv. If both, what is the cost differential of sale?
        v. If both, how do you ensure the diploid grass carp or un-certified grass carp do not contaminate the certified triploid grass carp lot you are holding and selling?
            1)Have you had cases where the lots get mixed?
    b. How long do you hold your grass carp?
    c. Do you have buyers arranged prior to obtaining your grass carp?
    d. How many locations and employees do you have?
        i. If multiple locations, where?
    e. How many ponds or tanks do you have designated for grass carp?
    f. Do you operate seasonally or year-round?
    g. Do you ship live grass carp via air freight, FedEx, or UPS?
    h. What is the "range" in which you sell grass carp (i.e., are your customers local or out-of-state and what states)?
    i. Do you keep records on how many grass carp you sell and where they go?
        i. If yes, can you share any or all of those records (not for publication)?
    j. Are you aware of the regulations and/or ploidy requirements for other states?
    k. How often do state or federal agents inspect grass carp in your possession for ploidy or request paperwork for import or possession?
    l. Does your business have BMPs or a HACCP plan for grass carp?
        i. If yes, can you provide a copy of BMPs of a HACCP plan?
        ii. What training or protocols do *you* have or do you provide to your employees concerning grass carp regulations or BMPs (e.g., HACCP or BMP renewed on interval)?
    m. Can you identify any potential activities or pathways for illegal or accidental introduction of diploid or triploid grass carp in states where they are prohibited?
    n. What other shippers/distributors or commercial facilities do you recommend we contact to inquire about grass carp production, sale, shipping and distribution?

9. **Truck Distributor- no holding facility**- purchase and transport fish from a producer and sell them for profit to individuals, hatcheries, state or local government, or food processers/distributors (e.g., "fish trucks", consultants or haulers)
    a. Do you haul diploid grass carp, triploid grass carp, or both?
        i. If triploid, are they all USFWS certified?
            a. **Skip for Contract Hauler** If not, why?
        ii. If both, what percentage of your grass carp business is diploid versus triploid?
        iii. **Skip for Contract Hauler** If both, what is the cost differential?
        iv. Do you haul both diploid and triploid grass carp or both certified and un-certified triploid grass carp on the same truck?
            2)If yes, how do you ensure the diploid grass carp do not contaminate the triploid grass carp lot you are hauling?
            3)Have you had cases where the lots get mixed?
            4)What did or would you do?
    b. When you haul grass carp, are there other species on the same load?
        i. What percentage of your load is usually the other species versus grass carp?
        ii. How do you ensure the grass carp do not contaminate the other species you are hauling?
    c. Do you occasionally carry fish from different producers on the same load?
    d. Do you ever have an instance where you have extra fish that you must "get rid of"?
        i. If yes, how do you do so?
            1)Do you ever consolidate lots with extras to empty tanks?
    e. How many employees do you have?
    f. How many trucks do you have and/or operate?
    g. Do you operate seasonally or year-round?
    h. What is the "range" in which you haul grass carp?
        i. How many states do you typically visit and how often?
        ii. What states do you go to?
    i. Do you keep records on how many grass carp you pick up, deliver, hold, transport, and where they go?
        i. If yes, can you share any or all of those records (not for publication)?
    j. Are you aware of the regulations and/or ploidy requirements for each state?
        i. **Contract Hauler only**- Does the individual hiring you to haul grass carp inform you of regulations concerning the transport of grass carp?
    k. **Skip for Contract Hauler** Are you ever required to obtain a permit or state authorization from out-of-state to possess, deliver or sell grass carp?
        a. If yes, how many states and which ones?
    l. How often do state or federal agents inspect your grass carp shipments for ploidy or request paperwork during transport?
    m. Does your business have BMPs or a HACCP plan for grass carp sale, shipping, or distribution?
        i. If yes, can you provide a copy of BMPs or a HACCP plan?
        ii. What training or protocols do *you* have or do you provide to your employees concerning regulations about transporting grass carp or BMPs (e.g., HACCP or BMP renewed on interval)?
    n. Can you identify any potential activities or pathways for illegal or accidental introduction of diploid or triploid grass carp in states where they are prohibited?
    o. What other shippers/distributors or commercial facilities do you recommend we contact to inquire about grass carp production, sale, shipping and distribution?

10. **Truck Distributor with Holding Facility**- purchase and transport fish from a producer and sell them for profit to individuals, hatcheries, state or local government, or food processers/distributors (e.g., "fish trucks", consultants or haulers)

- **In regard to trucking operations**
    a. Do you haul diploid grass carp, triploid grass carp, both, or other fish?
        i. Do you haul diploid and triploid grass carp, certified and un-certified triploid grass carp, or other fish species on the same truck?
            1) If yes, how do you ensure the lots aren't mixed?
            2) Have you had cases where the lots get mixed?
            3) What did or would you do?
    b. Do you occasionally carry fish from different producers on the same load?
    c. Do you ever have an instance where you have extra fish that you must "get rid of"?
        i. If yes, how do you do so?
            1) Do you ever consolidate lots with extras to empty tanks?
    d. How many trucks do you have and/or operate?
    e. Do you operate seasonally or year-round?
    f. What is the "range" in which you haul grass carp?
        i. How many states do you typically visit and how often?
        ii. What states do you go to?
        iii. Do you have diploid grass carp on loads destined for triploid only states or do you have any forms of grass carp on loads destined for states that prohibit grass carp?
            1) if yes, what procedure is used to assure that prohibited fish are not sold or unloaded in those states?
    g. Are you ever required to obtain a permit or state authorization from out-of-state to possess, deliver or sell grass carp?
        i. If yes, how many states and which ones?

- **In regard to holding**

    a. Do you sell diploid grass carp, triploid grass carp, both or other fish?
        i. If triploid, are they all USFWS certified?
            1)If not, why?
        ii. If both, what percentage of your grass carp business is diploid versus triploid?
        iii. If both, what is the cost differential of sale?
        iv. If both, how do you ensure the diploid grass carp or un-certified grass carp do not contaminate the certified triploid grass carp lot you are holding and selling?
            1)Have you had cases where the lots get mixed?
            2)What did or would you do?
    b. How long do you hold your grass carp?
    c. Do you have buyers arranged prior to obtaining your grass carp?
    d. How many locations do you have?
        i. If multiple locations, where?
    e. How many ponds or tanks do you have designated for grass carp?
    f. Do you operate seasonally or year-round?
    g. Do you ship live grass carp via air freight, FedEx, or UPS?
    h. What is the "range" in which you sell grass carp (i.e., are your customers local or out-of-state and what states)?

- **General**

a. How many employees do you have?
b. Does your business have BMPs or a HACCP plan for grass carp sale, shipping, or distribution?
    i. If yes, can you provide a copy of BMPs or a HACCP plan?
    ii. What training or protocols do *you* have or do you provide to your employees concerning regulations about transporting grass carp or BMPs (e.g., HACCP or BMP renewed on interval)?
c. Do you keep records on how many grass carp you pick up, deliver, hold, transport, and where they go?
    i. If yes, can you share any or all of those records (not for publication)?
d. Are you aware of the regulations and/or ploidy requirements for other states?
e. How often do state or federal agents inspect grass carp in your possession for ploidy or request paperwork for import or possession?
f. Can you identify any potential activities or pathways for illegal or accidental introduction of diploid or triploid grass carp in states where they are prohibited?
g. What other shippers/distributors or commercial facilities do you recommend we contact to inquire about grass carp production, sale, shipping and distribution?

11. **Food Fish Market** (you hold live fish and sell them for a profit to individuals for consumption)
    a. Are the grass carp dead or alive when they arrive at your market?
        a. If alive, are the grass carp dead or alive when the customer leaves your market?
        b. If dead, what is the method used to assure they are dead?
    b. Do you sell diploid grass carp, triploid grass carp or both?
    c. If you sell both, how do you ensure the diploid grass carp do not contaminate the triploid grass carp lot you are selling?
    d. If you sell triploid grass carp, are the triploid grass carp you sell USFWS certified?
    e. If you sell both diploid and triploid grass carp, what percentage of your grass carp business are diploids versus triploid?
    f. What is the cost differential between diploid and triploid grass carp?
    g. Do you keep records on how many grass carp you sell? Can you share any or all of those records?
    h. Are you aware of the grass carp regulations and/or ploidy requirements for your state?
    i. How often does state or federal agents inspect the grass carp in your possession for ploidy or certification paperwork? **Delete for green states**
    j. Can you identify any potential activities or pathways for illegal or accidental introduction of diploid grass carp in States where they are prohibited?
    k. What other grass carp markets or facilities do you recommend we contact to inquire about grass carp sale and distribution?

Commercial Grass Carp Production Questionnaire

Date:	State:
Company:	Contact:
Phone:	e-mail:

GENERAL

1. How many years have you been producing grass carp?
2. How many employees do you have? How many locations?
3. Do you currently raise diploid grass carp?
4. Do you currently raise triploid grass carp?

DIPLOIDS

5. Do you spawn your own diploids or buy fry/fingerlings?
6. Who do you sell diploid grass carp to- I will elaborate with questions below, please answer to the best of your ability
    a. Do you sell diploid grass carp directly to individual private pond owners or agencies for vegetation control?
    b. Do you sell diploid grass carp directly to private fish farmers for vegetation control?
    c. Do you sell live or dead diploid grass carp directly to fish markets or individuals for consumption?
    d. If you spawn diploids, do you sell diploid grass carp fry directly to fish farmers to raise, in-state or out-of-state?
    e. Do you sell to distributors?
    f. Do you contract fish distribution?
    g. If yes, do you remain in contact with the driver after leaving your business?
        i. Do you know <u>the entire intended route</u> for grass carp being hauled to destinations (driver's route)?
        ii. If there are stops, are they documented and are they ever advertised and are states notified?

TRIPLOIDS

7. Do you buy triploid fry/fingerlings?
    a. Are they USFWS certified prior to purchase?
    b. What method is used to determine the percentage of triploids in the lot?
    c. If yes, what is the percentage of triploids in the lot at purchase?
8. Do you spawn your own triploids?
    a. Do you have a separate facility to retain diploid brood stock?
    b. What precautions (either facility or procedures) ensure there is no escapement?
    c. What method do you use to test your fish and how many are tested?
    d. What is the average percentage of triploids in a lot prior to final testing (i.e. What is the percentage of diploids culled during the testing process to ensure triploidy)?
    e. When diploids are encountered in the ploidy production process, at what diploid percentage do you reject the entire lot?
    f. What is the fate of fish in failed triploid production lots?
9. Do you participate in the USFWS Triploid Grass Carp Ploidy Verification Program?
    a. If no, is there a specific reason why?

b. If yes, when a lot of tested triploids fails a USWFS Inspection what do you do with the lot?

10. Who do you sell triploid grass carp to- I will elaborate with questions below, please answer to the best of your ability
    a) Do you sell triploid grass carp directly to individual private pond owners or agencies for vegetation control?
    b) Do you sell triploid grass carp directly to private fish farmers for vegetation control?
    c) Do you sell live or dead triploid grass carp directly to fish markets or individuals for consumption?
    d) If you spawn triploids, do you sell or distribute triploid fry to other growers? In-state or out-of state?
    e) Do you sell to other distributors?
    f) Do you contract fish distribution?
    g) If yes, do you remain in contact with the driver after leaving your business?
        i. Do you know the entire intended route for grass carp being hauled to destinations (driver's route)?
        ii. If there are stops, are they documented and are they ever advertised and are states notified?
11. Do you verify the buyer's state permit to possess triploid grass carp (if required)?

FACILITIES WITH BOTH DIPLOID AND TRIPLOID – ADDITIONAL QUESTIONS

Note: Business data will be combined and individual business' cost and volume information not revealed.

12. What is the cost differential between diploid and triploid grass carp?
13. What percentage of your grass carp business is diploid versus triploid?

GENERAL

14. Is your facility at risk of flooding (which could allow comingling of fish from different ponds)?
15. Does your facility have SOPs, BMPs or a HACCP plan for grass carp production, sale, shipping and distribution?
    a. Can you provide a copy of SOPs, BMPs or a HACCP plan?
    b. How do you ensure your employees follow your protocols?
    c. Do you possess a state permit that has specific biosecurity requirements for your facility?
16. Do you maintain sales/shipping records for grass carp?
    a. Can you provide any of the information, such as number of fish sold, where they are shipped and who ships them?
17. Are you familiar with ploidy requirements for each state?
    a. If yes, do you ever have requests for diploid or triploid grass carp from someone in a state where either is prohibited?
    b. If yes, how do you handle these requests?
    c. Can you identify any potential activities or pathways for illegal or accidental introduction of diploid grass carp in states where they are prohibited?
18. What other shippers/distributors or commercial facilities do you recommend we contact to inquire about grass carp production, sale, shipping and distribution?

Additional questions for those distributing

- **In regard to trucking operations**
  a. Do you haul diploid grass carp, triploid grass carp, both, or other fish?
     i. Do you haul diploid and triploid grass carp, certified and un-certified triploid grass carp, or other fish species on the same truck?
        1) If yes, how do you ensure the lots aren't mixed?
        2) Have you had cases where the lots get mixed?
        3) What did or would you do?
  b. Do you ever have an instance where you have extra fish that you must "get rid of"?
     i. If yes, how do you do so?
        1) Do you ever consolidate lots with extras to empty tanks?
  c. How many trucks do you have and/or operate?
  d. Do you operate seasonally or year-round?

- **In regard to holding**

  a. Do you have buyers arranged prior to obtaining your grass carp?
  b. How many ponds or tanks do you have designated for grass carp?
  c. Do you ship live grass carp via air freight, FedEx, or UPS?

- **General**

  a. How often do state or federal agents inspect grass carp in your possession for ploidy or request paperwork for import or possession?
  b. What training or protocols do *you* have or do you provide to your employees concerning regulations about transporting grass carp or BMPs (e.g., HACCP or BMP renewed on interval)?

State Grass Carp Questionnaire

Date:
State and Contact Person:

Rules and Regulations:

Do you allow grass carp to be stocked in the state? ☐ Yes ☐ No
If yes, do you allow diploid grass carp to be stocked in the state? ☐ Yes ☐ No
If no, can diploids be allowed in aquaculture and research facilities? ☐ Yes ☐ No
If yes, do you require a permit? ☐ Yes ☐ No

What is your rationale for allowing triploids, diploids or no grass carp?

Please provide your rules and regulations for grass carp permitting, shipping, stocking and enforcement.
Do multiple agencies regulate grass carp within your state? ☐ Yes ☐ No
If yes, please provide the information for those agencies.

Inspection and Enforcement:

Do you maintain shipping records for the import (transport) of grass carp? ☐ Yes ☐ No
Do you require shipments to be inspected for ploidy? ☐ Yes ☐ No
If yes, what is your protocol?
If yes, who inspects shipments for ploidy?
If yes, how often might you intercept/check shipments?
If yes, are notifications sent prior to inspection? ☐ Yes ☐ No
If yes, what do you do if a shipment fails inspection?
Have you had any instances where diploid grass carp were accidentally introduced in prohibited areas? ☐Yes☐No
Do you have an enforcement protocol?

Stocking Records:

Do you maintain stocking records for grass carp? ☐ Yes ☐ No
Do these records include stockings by the state? ☐ Yes ☐ No
If yes, can you provide stocking site information? ☐ Yes ☐ No
If yes, can you provide 10 years of information? ☐ Yes ☐ No
Do your records include stockings by commercial (private) suppliers? ☐ Yes ☐ No
If yes, can you provide stocking site information? ☐ Yes ☐ No
If yes, can you provide 10 years of information? ☐ Yes ☐ No
Do you maintain records of wild caught grass carp? ☐ Yes ☐ No
Are the records for live or dead grass carp?
If yes, can you provide stocking site information? ☐ Yes ☐ No
If yes, can you provide 10 years of information? ☐ Yes ☐ No
Can you identify how many grass carp, dead or alive, are going to the food market?

Grass Carp Production, Holding and Distribution:

Will you provide the number and type (public/private) of grass carp facilities located within your state? ☐ Yes ☐ No
Can you provide contact information for these producers/distributors? ☐ Yes ☐ No
Of these, who do you recommend we contact?

Do the grass carp facilities in your state have BMPs or HACCPs for biosecurity? ☐ Yes ☐ No
Can you provide records of BMPs or HACCPs? ☐ Yes ☐ No

Federal Grass Carp Questionnaire

Date:
Contact:

Are the written protocols for the USFWS Triploid Grass Carp Ploidy Inspection and Certification Program available on the website the most recent versions of the written protocols? If not, can you provide the most recent written protocols?

How many producers currently participate in the program? And where are they located?

How many inspectors are currently trained to provide inspections?

- How is training conducted and how often?
- How many trained inspectors are actively providing inspections?
- Where are the trained inspectors located and what regions/States do they serve?

How often are inspections requested?

- What method is used? Flow Cytometry or Coulter Counter?
- Do you have any suggestions for improving the method of testing?
- How do you keep track of the inspections and results of inspections?
- Can you provide this data?
- How often does a producer tested lot fail a USFWS inspection?

What is the protocol following a failed inspection? What happens to the fish in the lot (i.e. is there a method of assuring that a failed lot does not enter the triploid supply chain?)?

- Are there any fines or penalties associated with the program?

Are you aware of any recent importation of grass carp from foreign countries?

Can you identify any potential activities or pathways for illegal or accidental introduction of diploid grass carp in States where they are prohibited?

Can you identify any possible improvements to the program?

Can you identify any actions outside of the program that could reduce or prevent the illegal or accidental introduction of diploid grass carp in States where they are prohibited?

We are a consulting firm hired to evaluate the USFWS grass carp program. Site visit Oct to Nov

(Name, date, state and phone number)

1. Do you handle grass carp?
   (Elaborate: produce, distribute or hold?)
2. What type of grass carp do you handle?
   (Diploid, triploid and/or certified triploids?)
3. What is the "range" in which you haul grass carp?
   (States they visit?)
4. Where do you supply grass carp (disposition)?
5. Do you haul different types of grass carp in the same load?
   i. Have you had cases where the lots get mixed?
   ii. What do you do with the extras in a shipment?
   iii. (If they have diploids) Do you haul diploids and triploids through states where one or both are not allowed?

If there is good cooperation, we will potentially ask 1 or more of the following:

1. Do you ever get requests from customers in states that restrict or prohibit certain types of grass carp?
   i. Do you know the ploidy requirements for each state or do you rely on your customers for the information?
2. Can you identify any potential activities or pathways for illegal or accidental introduction of diploid or triploid grass carp in states where they are prohibited?

Summary of Private Facilities

Distributor Tpe	Alabama	Arkansas	California	Colorado	Connecticut	Florida	Georgia	Hawaii	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana
Out of GC Business	-	10	-	3	1	2	4	3	-	9	9	4	4	-	1
Fish Day Facility	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Producer	2	2	1	1	-	3	1	-	-	-	-	-	-	-	-
Grow Out	4	0	-	-	-	-	1	1	-	2	2	1	-	-	-
Food Fish Market		-	-	-	-	-	-	-	-	1	-	-	-	-	2
Distributor No Holding	2	5	-	2	-	12	5	-	-	-	2	-	-	-	-
Fish Truck	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Warehouse	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-
Food Fish Distributor	1	1	-	-	-	1	1	-	-	-	-	-	-	-	-
Truck With Holding	2	2	-	7	2	9	4	-	1	1	2	2	2	2	-
all grow-outs marked are also truck/distributor, but are not marked in both spots, only in grow-out															

	Mississippi	Missouri	Nebraska	New Jersey	New York	North Carolina	Ohio	Oklahoma	Pennsylvania	South Carolina	South Dakota	Tennessee	Texas	Virginia	Washington	West Virginia
Out of GC Business	-	-	2	1	3	5	-	-	-	3	-	-	1	-	-	-
Fish Day Facility	-	-	18	-	18	-	-	-	-	-	-	-	-	-	-	-
Producer	2	4	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Grow Out	2	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-
Food Fish Market	-	-		-		-		-	-	-	-	-	-	-	-	-
Distributor No Holding	2	1	-	-	1	-	-	1	1	5	-	-	1	-	-	-
Fish Truck	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Warehouse	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Food Fish Distributor	-	-	1	-	1	-	1	1	-	-	-	-	-	-	-	-
Truck With Holding	2	3	1	-	10	4	2	1	5	6	1	same	14	2	2	1
all grow-outs marked are also truck/distributor, but are not marked in both spots, only in grow-out										1 (wouldn't answer questions)			1 wouldn't answer questions	1 wouldnt answer what type		

C

FEDERAL CERTIFICATION AND STATE STOCKING RECORDS

ICRA

Mississippi Interstate Cooperative Resource Association
9653 Route 148 Marion, IL 62959 (618) 997-4868

National Analysis of Grass Carp (*Ctenopharyngodon idella*)

State Agencies Information Provided					
State*	State Stocking Records	Private Stocking Records	Private Grass Carp Facilities	Commercial Grass Carp Fishing Records	Best Management Practices for Grass Carp
Alaska	-	-	-	-	-
Maine	-	-	-	-	-
Maryland	-	-	-	-	-
Massachusetts	-	-	-	-	-
Michigan	-	-	-	X	-
Minnesota	-	-	-	X	-
Montana	-	-	-	-	-
New Hampshire	-	-	-	X	-
North Dakota	-	-	-	-	-
Rhode Island	-	-	-	-	-
Vermont	-	-	-	-	-
Wisconsin	-	-	-	X	-
Arizona	Don't keep records	Don't keep records	Don't keep records	Don't keep records	Don't require
California	Not all compiled	Not all compiled	X	Not all compiled	Don't require
Connecticut	X	x	X	Don't keep records	Don't require
Delaware	X	X	None in the state	Don't have commercial fishing	Don't require
Florida	X	X	X	Don't keep records	Maybe (permit has some of the requirements)
Georgia	Don't keep records	Don't keep records	X	Don't keep records	Get from facility
Idaho	X	X	X	Don't keep records	Get from facility
Illinois	Not all compiled	Not all compiled	X	X	Get from facility
Indiana	X	X	X	No column for grass carp	Don't require
Kansas	X	X	None in the state	Don't keep records	Don't require
Kentucky	X	Don't keep records	None in the state	Don't keep records	Don't require
Louisiana	X	FOIA information not received	FOIA information not received	FOIA information not received	Don't require
Nevada	X	X	None in the state	Don't keep records	Don't require
New Jersey	X	X	X	Don't keep records	Don't require
New Mexico	X	X	None in the state	Don't keep records	Don't require
New York	Not all compiled	Not all compiled	X	Don't keep records	Don't require
North Carolina	X	X	X	Don't keep records	Get from facility
Ohio	X	Don't keep records	X	Don't keep records	Don't require (permits have some requirements)
Oklahoma	X	N/A (All stockings are done by the state)	X	Don't keep records	X (don't know if facilities abide by them)
Oregon	No state stockings	X	X	Don't keep records	X verbal in interview
Pennsylvania	X	X	X	Don't keep records	Don't require
South Carolina	Requested but never received	Don't keep records	X	Don't keep records	X
South Dakota	No state stockings	X	None in the state	Don't keep records	Don't require
Tennessee	X	Don't keep records	X	Don't keep records	Don't require
Texas	X	X	X	Requested but never received	Have to maintain certain standards, but nothing provided
Utah	X	Don't keep records	X	Don't keep records	Don't require
Virginia	X	X	X	Don't keep records	Don't require
Washington	No state stockings	X	X	Don't keep records	Don't require
West Virginia	Don't keep records	Don't keep records	X	Don't keep records	Don't require
Wyoming	X	X	X	Don't keep records	Don't require
Alabama	X	Don't keep records	X	Don't keep records	Don't require
Arkansas	X	Don't keep records	X	Don't keep records	Don't require
Colorado	X	Not compiled and confidential Importation permits provided	X	Don't keep records	Don't require
Hawaii	Don't keep records	Don't keep records (Provided some importation permits)	X	Don't keep records	Don't require
Iowa	X	X	X	X	Don't require
Mississippi	X	Don't keep records	X	Don't keep records	Don't require
Missouri	X	Don't keep records	Requested but never received	No column for grass carp	Don't require
Nebraska	X	Not all compiled		No column for grass carp	Don't require

*Red states marked with a - are not applicable because grass carp are prohibited

Federal and State Stocking Data

State	USFWS Data # Fish 10-Year Avg.	State Data # Fish 10-Year Avg.	USFWS # Fish 2012	State Data # Fish 2012	USFWS # Fish 2011	State Data # Fish 2011	USFWS # Fish 2010	State Data # Fish 2010	USFWS # Fish 2009	State Data # Fish 2009	USFWS # Fish 2008	State Data # Fish 2008	USFWS # Fish 2007	State Data # Fish 2007	USFWS # Fish 2006	State Data # Fish 2006	USFWS # Fish 2005	State Data # Fish 2005	USFWS # Fish 2004	State Data # Fish 2004	USFWS # Fish 2003	State Data # Fish 2003	State Data # Fish 2002
Rhode Island**	1		0	not given	0	not given	7	not given	0	not given	0	not given	0	not given	0	not given	0	not given	0	not given	0	not given	
Arizona**	48,846		47,269	no records	48,999	no records	48,374	no records	49,304	no records	52,919	no records	55,792	no records	45,960	no records	50,831	no records	43,955	no records	45,057	no records	
California**	300		0	not given	0	not given	0	not given	0	not given	0	not given	0	not given	3,000	not given	0	not given	0	not given	0	not given	
Connecticut	1,398	1,770	2,265	1,610	1,252	1,451	1,344	1,535	1,250	1,472	1,052	2,100	1,580	2,284	680	1,146	1,015	2,265	1,950	1,927	1,590	1,917	1,768
Delaware	229	144	0	7	0	12	0	18	2,160	78	0	666	0	0	0	7	0	147	130	178	0	330	
Florida	109,250	186,869	103,520	128,608	65,563	152,106	104,906	174,206	96,262	198,908	163,233	221,262	84,392	183,147	106,968	218,181	66,624	146,872	154,251	237,866	146,785	253,593	140,805
Georgia**	20,569		10,611	no records	14,014	no records	8,385	no records	19,474	no records	26,629	no records	31,599	no records	16,485	no records	31,113	no records	22,883	no records	24,500	no records	
Idaho	3,466	4,339	1,200	1,817	5,100	5,372	3,800	4,254	2,600	2,923	3,600	5,769	2,400	2,836	3,000	3,729	5,250	6,627	5,100	6,608	2,610	3,454	
Illinois**	4,022		2,956	not given	4,246	not given	3,616	not given	2,679	not given	2,057	not given	4,041	not given	4,358	not given	6,399	not given	4,413	not given	5,457	not given	
Indiana	24,644	15,186	21,156	not given	20,513	not given	24,298	12,543	24,143	12,320	23,279	12,148	26,267	17,523	30,038	19,224	29,481	17,356	28,676	not given	18,592	not given	
Kansas	5,554	38,157	9,107	3,810	4,850	7,032	9,752	167	13,798	10,819	17,806	203,666	0	3,445	225	not given	0	not given	0	not given	0	not given	
Kentucky*	27,159	500	23,483	401	26,491	1,171	23,931	475	27,719	1,201	28,253	241	30,982	880	30,856	48	31,737	179	30,060	376	18,076	31	
Louisiana*	22,659	13,191	31,809	4,748	24,899	10,052	17,645	not given	41,182	21,300	37,085	14,854	23,060	not given	15,742	not given	21,568	15,000	7,033	not given	6,571	not given	
Nevada	572	379	2,613	10	918	870	108	1,656	6	155	0	134	45	131	41	320	55	686	470	28	1,464	128	47
New Jersey	1,415	720	1,600	534	600	323	1,600	691	1,400	764	2,050	1,001	1,105	1,005	1,600	no records	840	no records	1,573	no records	1,780	no records	
New Mexico	1,184	1,250	630	706	2,108	2,199	1,303	323	523	1,938	1,257	1,806	598	862	501	539	2,473	2,392	1,884	1,832	567	358	790
New York**	17,298		19,289	no records	14,579	no records	16,585	no records	19,991	no records	18,858	no records	18,645	no records	15,992	no records	14,956	no records	15,595	no records	18,486	no records	
North Carolina	44,611	16,499	48,525	19,415	40,569	11,562	49,026	15,885	45,540	17,955	39,988	7,270	44,065	15,325	42,818	7,325	47,770	23,200	45,204	2,500	42,602	49,550	11,500
Ohio*	46,637	64,044	39,473	no records	45,693	no records	46,190	no records	44,726	no records	43,795	no records	47,450	no records	49,675	no records	49,645	no records	49,232	no records	50,492	21,221	106,866
Oklahoma*	3,295	376	12,155	not given	8,898	1,200	11,892	not given	0	not given	0	not given	0	20	0	not given	0	not given	0	173	0	110	
Oregon	119	110	0	not given	76	35	299	163	174	117	40	30	200	225	202	96	147	89	23	27	31	230	84
Pennsylvania	4,768	2,957	4,224	2,148	4,601	2,563	5,835	2,727	4,925	4,590	5,941	4,451	4,491	2,258	5,496	2,247	4,478	2,238	4,650	2,630	3,036	3,028	3,644
South Carolina**	90		0	not given	0	not given	0	not given	0	not given	0	not given	0	not given	0	not given	0	not given	900	not given	0	not given	
South Dakota	2	345	0	598	0	12	0	82	0	not given	0	104	0	100	0	188	0	1,515	0	500	15	6	
Texas	70,506	60,058	75,615	70,766	47,493	44,698	44,344	35,393	52,796	40,057	108,870	100,580	109,801	99,295	101,247	67,054	45,314	74,820	47,286	50,418	72,291	50,338	27,223
Utah	889	591	1,069	734	2,865	2,875	1,235	385	1,098	28	146	85	177	0	15	15	180	180	1,128	1,040	980	919	236
Virginia	23,985	21,962	28,912	13,941	30,328	29,426	29,900	29,341	19,022	57,909	16,740	16,282	19,617	19,617	14,223	19,001	9,954	11,231	35,835	8,390	35,316	35,835	614
Washington*	3,121	20	1,440	20	1,445	20	1,000	20	6,775	20	1,550	20	2,590	20	4,785	20	1,900	20	2,366	20	7,355	20	20
West Virginia**	3,751		6,005	no records	5,999	no records	3,691	no records	3,860	no records	4,636	no records	4,602	no records	3,834	no records	2,320	no records	1,977	no records	589	no records	
Wyoming	243	400	100	not given	0	not given	0	not given	50	not given	75	not given	75	not given	320	not given	130	not given	824	400	860	not given	
Alabama*	1,932	1,231	0	35	6,725	4,005	5,515	685	0	1,174	0	1,071	7,000	1,135	0	80	0	848	0	2,044	80	not given	
Arkansas*	9	35,997	0	11,006	0	48,422	90	33,579	0	40,080	0	40,011	0	65,548	0	22,563	0	27,101	0	58,818	0	12,840	
Colorado*	5,916	1,881	5,057	8,948	4,788	362	4,286	4,113	9,555	607	6,960	1,052	7,868	1,422	4,616	169	3,751	50	4,977	not given	7,303	not given	207
Hawaii	92	2,003	30	1,600	50	1,840	5	2,570	0	not given	0	not given	20	not given	0	not given	810	not given	0	not given	0	not given	
Iowa	2	32,648	0	not given	0	30,044	0	31,735	0	43,401	0	22,448	0	31,012	0	27,692	0	41,374	15	40,128	0	28,933	29,712
Mississippi*	591	16,377	283	7,302	590	28,228	422	974	651	0	603	0	116	59,112	1,640	62,178	725	0	590	3,891	290	14,956	3,511
Missouri*	1	23,272	0	32,282	0	14,261	4	no records	10	no records	0	no records	0	no records	0	no records	0	no records	0	no records	0	no records	
Nebraska*	50	43	0	0	0	0	0	0	0	0	200	60	0	100	200	0	0	240	100	15	0	9	47
Tennessee**	62		6		515		100		0		0		0		0		0		0		0		
	496,161	401,021	500,402	311,046	434,767	400,141	469,488	353,250	492,298	457,816	607,622	657,811	523,744	507,302	504,517	451,822	429,766	374,430	486,234	419,809	512,775	477,806	327,074

* = Data is State Agency Stocking Only

** = No Records

Example Commercial Fishing Forms

MONTHLY COMMERCIAL CONTRACT REPORT

WATER FISHED - MONTH -

DATE	GEAR USED	CARP	BUFFALO	CARPSUCKER	BOWFIN	GAR	DRUM	ASIAN CARP	GRASS CARP	OTHER
TOTAL POUNDS										
AVERAGE PRICE/LB										

THIS REPORT IS TO BE SUBMITTED MONTHLY , WHETHER OR NOT YOU FISHED, NO LATER THAN THE 5TH OF THE FOLLOWING MONTH.

REPORT SUBMITTED BY: DATE_____

ADDRESS: CITY - STATE - ZIP -

MAIL TO : COMMERCIAL FISHING PROGRAM, One Confluence Way, East Alton, IL 62024

Signature _____

2013 ILLINOIS ANNUAL COMMERCIAL FISHERMAN REPORT

(**Read thoroughly – Answer completely – Please print**)

SPECIAL NOTE: *THE POUNDS OF FISH CAUGHT AND PREVIOUSLY REPORTED UNDER A COMMERCIAL CONTRACT SHOULD NOT BE REPORTED AGAIN ON THIS REPORT.*)

IMPORTANT REMINDER: ILLINOIS LAW REQUIRES THIS REPORT TO BE SUBMITTED TO: **ILLINOIS DEPARTMENT OF NATURAL RESOURCES, COMMERCIAL FISHING PROGRAM, ONE CONFLUENCE WAY, EAST ALTON, IL 62024. BY January 31, 2014** YOU WILL NOT BE ISSUED A 2014 COMMERCIAL FISHING LICENSE UNTIL THIS REPORT IS RECEIVED BY DNR. THIS FORM WILL BE RETURNED TO YOU IF INFORMATION IS INCOMPLETE

Type of fisherman reporting: Full-time (Sold fish) _____Part-time (Sold fish) _____

Recreational or subsistence (primarily for Sport or Family Use, sold no fish) _____

CATCH REPORT SECTION (A separate catch report section must be submitted for each river pool, lake or stream fished. See back for more sections)

NAME OF RIVER OR LAKE: _____ POOL NAME OR NUMBER: _____COUNTY:_____

Please report only whole fish weights (pounds)of all fish except those released immediately unharmed.)

SPECIES	SEINE	TRAMMEL	GILL	HOOP	BASKET	TROTLINE	AVE. PRICE RECEIVED FROM SALE OF WHOLE FISH	COMMENTS
Carp								
Buffalo								
White Perch (Drum)								
Channel Catfish								
Flathead Catfish								
Blue Catfish								
Bullheads (all kinds)								
Carpsuckers (White Carp)								
Suckers (including redhorse)								
Gar (all kinds)								
Bowfin (Dogfish)								
Mooneye & Goldeye (Toothed Herring)								
Eel								
Grass Carp (White Amur)								
Bighead/Silver (Asian Carp)								

GEAR	AMOUNT OWNED	AMOUNT LICENSED
Yds. Seine		
Yds. Trammel		
Yds. Gill Net		
Basket Traps		
Hoop Nets		
Trotlines (100 Hooks)		

DID YOU SELL OR BARTER FISH MEAT TO A FISH MARKET? YES___ NO___

IF YES, LIST MARKET(S) AND LOCATION(S)

MARKET(S)_____

LOCATION(S)_____

DID YOU SMOKE AND SELL FISH (YES or NO)

Pounds Sold/ Average Price.

Paddlefish / Carp /

Sturgeon _____/_____ Other _____/

DISPOSITION OF TOTAL WEIGHT OF FISH

: % Sold _____; % Donated _____; % Personal Use _____

I DECLARE UNDER PENALTY OF PERJURY THAT THE STATEMENTS ON THIS REPORT ARE TRUE AND ACCURATE AND HEREBY AUTHORIZE DNR TO MAKE FURTHER INQUIRIES TO VERIFY THESE STATEMENTS.

SIGNATURE_____ DATE_____ DAYTIME PHONE NUMBER_____

CATCH REPORT SECTION

NAME OF RIVER OR LAKE_____ _____POOL NAME OR NUMBER_____COUNTY_____

SPECIES	SEINE	TRAMMEL	GILL	HOOP	BASKET	TROTLINE	AVE. PRICE PAID FOR FISH	COMMENTS
Carp								
Buffalo								
White Perch (Drum)								
Channel Catfish								
Flathead Catfish								
Blue Catfish								
Bullheads (all kinds)								
Carpsuckers (White Carp)								
Suckers (including redhorse)								
Gar (all kinds)								
Bowfin (Dogfish)								
Mooneye & Goldeye (Toothed Herring)								
Eel								
Grass Carp (White Amur)								
Bighead/Silver (Asian Carp)								

CATCH REPORT SECTION

NAME OF RIVER OR LAKE_____ _____POOL NAME OR NUMBER_____COUNTY_____

SPECIES	SEINE	TRAMMEL	GILL	HOOP	BASKET	TROTLINE	AVE. PRICE PAID FOR FISH	COMMENTS
Carp								
Buffalo								
White Perch (Drum)								
Channel Catfish								
Flathead Catfish								
Blue Catfish								
Bullheads (all kinds)								
Carpsuckers (White Carp)								
Suckers (including redhorse)								
Gar (all kinds)								
Bowfin (Dogfish)								
Mooneye & Goldeye (Toothed Herring)								
Eel								
Grass Carp (White Amur)								
Bighead/Silver (Asian Carp)								

Commercial Roe Harvest Report Form for May 2015

Name _____ Address _____ City _____ State _____ permit stamp # _____

Signature _____

I declare under penalty of perjury that the statements on this report are true and accurate and hereby authorize the DNR to make further inquiries to verify

Date _____ Enter Fish Caught:

		(Paddlefish, Sturgeon or Bowfin)		Roe Weight (circle) processed or unprocessed		Live Weight			Roe Weight (circle) processed or unprocessed		Live Weight				
	River Fished	Area	Gear	Pounds	Price/ #	Pounds	Price/ #	Number	Pounds	Price/ #	Pounds	Price/ #	Number	Sold To:	Date
1-May															
2-May															
3-May															
4-May															
5-May															
6-May															
7-May															
8-May															
9-May															
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26-May															
27-May															
28-May															
29-May															
30-May															
31-May															

D

EXAMPLE STATE REGULATIONS

National Analysis
of Grass Carp
(*Ctenopharyngodon idella*)

Louisiana

Chapter 9. Aquaculture

§901. Triploid Grass Carp

A. General Provisions

1. No person, firm or corporation shall at any time possess, sell or cause to be transported into this state, triploid grass carp (Ctenopharyngodon idella), except in accordance with and in compliance with the following regulations.

a. The following regulations govern the importation, transportation, possession, disposal and sale of live triploid grass carp for aquatic plant control in private and public waters, including ponds on public golf courses, municipal water treatment plants, parks and zoos. Nothing contained herein shall be construed to restrict or prevent the department from conducting bona-fide research studies and fish and aquatic plant management programs as authorized by law or regulation.

2. Definitions

Department—the Louisiana Department of Wildlife and Fisheries or an authorized employee of the department.

Permittee—individual that possesses a valid Louisiana triploid grass carp permit. A permittee can only be a natural person. A permittee may represent himself, a business, corporation or organization. The permittee is responsible for compliance with all stipulations in the permit.

Secretary—the secretary of the Louisiana Department of Wildlife and Fisheries.

Triploid Grass Carp—refers to Ctenopharyngodon idella fingerlings and larger individuals that are certified as triploid carp (3N chromosomes) by the U.S. Fish and Wildlife Service or a qualified agent or contractor approved by the department.

Triploid Grass Carp Possession and Transportation Permit—the official document that identifies the terms of and allows for the importation, transportation and possession of live triploid grass carp in Louisiana for use in privately owned waterbodies.

Triploid Grass Carp Sales Permit—the official document that allows for the importation, transportation, possession and sale of live triploid grass carp in Louisiana as approved by the secretary or his designee.

Triploid Grass Carp Seller—a properly licensed fish farmer who possesses a triploid grass carp sales permit.

B. Triploid Grass Carp Possession and Transport Permit

1. General Rules for Triploid Grass Carp Possession and Transportation Permit

a. No person shall stock private waterbodies in the state of Louisiana without a triploid grass carp possession and transport permit.

b. No person shall import, transport and/or purchase triploid grass carp to be brought into the state of Louisiana unless such fish are certified as triploid grass carp

by the U.S. Fish and Wildlife Service or a qualified agent or contractor approved by the department.
c. No person shall import, transport or possess fingerlings less than six inches in total length or eggs or fry within the state of Louisiana.
d. Permits are not transferable from person to person or from site location to site location.
e. Permittee shall provide an adequate number of triploid grass carp to the department, at no cost to the department, upon request, to verify ploidy. The permittee shall agree to allow department officials or a department approved contractor to conduct unannounced random inspections of the transport vehicle, property, waterbody site and fish.
f. Department officials may be accompanied by other persons during these inspections. The department or its agents have the right to remove or take fish samples for analysis and/or inspection.
g. Permittee is responsible for damages caused by any escapement.
h. In cases of mortality or unavoidable loss, restocking will be permitted as long as permit is still valid.
i. If a permittee terminates the use of triploid grass carp in the permitted waterbody, the permittee shall notify the department immediately and dispose of the triploid grass carp according to methods approved by the department.
j. In additional to all other legal remedies, failure to comply with any of the provisions in this Section shall be just cause to immediately suspend and/or revoke the permittee's permit. All triploid grass carp shall be destroyed at permittee's expense under the department's supervision within 30 days of permit revocation. Violation of any of the provisions of the permit constitutes a Class Four violation in accordance with R.S. 56:319(E).
k. Any permittee charged with violation of this Section may make a written response to the alleged violation(s) to the secretary, and may request a hearing to review the alleged violation(s).
l. Qualified universities and public entities conducting research approved by or in conjunction with the department shall be exempt from fee charges.
2. Request Procedure for a Triploid Grass Carp Possession and Transport Permit
a. Individuals wishing to import or possess live triploid grass carp in Louisiana, but not sell them, must apply for a triploid grass carp possession and transport permit from the department for a fee of $50.
b. The triploid grass carp possession and transport permit shall be valid for one year from date of purchase. Permittee must request new permit for subsequent purchases if permit has expired.
c. Permittees may stock up to 10 fish per acre of water, and shall not exceed 500 fish. Request to stock more than 500 fish must be approved by the department through site visitations by a department representative. Fisheries

staff of the Louisiana Cooperative Extension Service or other qualified fisheries professional approved by the department may be used as a substitution for departmental site visit.
3. Requirement for transporting and stocking of triploid grass carp in private water bodies
a. Permittee mush have in his immediate possession and available upon demand by department representatives, a triploid grass carp possession and transportation permit when importing, transporting and/or purchasing live triploid grass carp within the state of Louisiana.
b. A bill of lading must accompany those individuals in possession of live triploid grass carp during transportation and shall include:
i. source of triploid grass carp (hatchery);
ii. name, address and phone number of seller;
iii. name, address and phone number of buyer;
iv. copy of triploid certification;
v. total number of fish;
vi. destination of shipment.
c. No person shall stock private waters in the state of Louisiana without a valid triploid grass carp possession and transport permit.
d. Permittee is responsible for containing triploid grass carp in his private waterbody. Permittee is also responsible for erecting barriers to prevent the escape of triploid grass carp into adjoining waters.
e. This permit does not authorize the permittee to stock triploid grass carp in public waterbodies of the state. Release of any fish into the waters of the state is strictly prohibited, except as provided in Subsection D below.
C. Triploid Grass Carp Sales Permit
1. Request Procedure for a Triploid Grass Carp Permit
a. Individuals wishing to sell live triploid grass carp in the state of Louisiana must first request a triploid grass carp sales permit through an application furnished by the department.
b. The triploid grass carp sales permit shall be valid for one year beginning January first and ending December thirty-first of that same calendar year. The permit may be purchased at any time during the year for the current permit year and beginning November fifteenth for the immediately following permit year. The cost of a triploid grass carp sales permit is $250.
c. An annual report detailing each sales transaction, including name and address of permitted buyer, permit number, date and number of triploid grass carp sold must be submitted with permit renewal application.
2. Requirement for Triploid Grass Carp Sales Permit
a. No person shall import or cause to be imported into the state of Louisiana triploid grass carp unless certified as triploid grass carp by the U.S. Fish and Wildlife Service or a qualified agent or contractor approved by the department. Such certification must be furnished to and approved by the department prior to importing of any fish

into the state of Louisiana for stocking.
b. A triploid grass carp seller must possess a valid domestic aquatic organism license.
c. The person shall ship triploid grass carp with the words "TRIPLOID GRASS CARP" prominently on at least two sides of the vehicle or hauling tank with block letters that are not less than four inches high.
d. A triploid grass carp seller is bound by the triploid grass carp possession and transportation regulations as stipulated in LAC 76:VII.901.B; except that:
i. the triploid grass carp sales permit serves in lieu of the triploid grass carp possession and transportation permit;
ii. the holders of a triploid grass carp sales permit may only sell live triploid grass carp to holders of a valid triploid grass carp possession and transportation permit or a triploid grass carp sales permit;
iii. no person shall sell more than 500 triploid grass carp to an individual possessing a valid triploid grass carp possession and transport permit unless otherwise stipulated by the department in the permit.
e. A triploid grass carp seller shall notify the department at the designated telephone number (1-800-442-2511) of shipments of live triploid grass carp to permitted buyers at least 24 hours prior to shipment. Notification shall include seller’s permit number, buyer's name, address, buyer’s permit number, number of fish, destination of shipment and date.
f. In addition to all other legal remedies, failure to comply with any of the provisions in this section shall be just cause to immediately suspend and/or revoke the permittee's permit. All triploid grass carp shall be destroyed at permittee's expense under the department's supervision within 30 days of permit revocation. Violation of any of the provisions of the permit constitutes a class four violation in accordance with R.S. 56:319(E).
D. Requirements for Stocking Triploid Grass Carp in Public (state or local) Waterbodies
1. No person shall release triploid grass carp into the public waters of Louisiana without written approval of the secretary or his designee. Individuals, organizations and local governments may request, in writing, that they be allowed to stock triploid grass carp in public waters. The department shall review the request, and if approved, shall provide written approval signed by the secretary or his designee.
AUTHORITY NOTE: Promulgated in accordance with R.S. 56:318, R.S. 56:319 and R.S. 56:319.1.

HISTORICAL NOTE: Promulgated by the Department of Wildlife and Fisheries, Office of Fisheries, LR 17:806 (August 1991), amended LR 19:511 (April 1993), LR 24:962 (May 1998), LR 37:3534 (December 2011), repromulgated LR 38:433 (February 2012).

Illinois

Live fish imports/ fish health requirements

(515 ILCS 5/10-105) (from Ch. 56, par. 10-105)

Sec. 10-105. Fish importation permits. Live fish, viable fish eggs, or viable sperm of any species or hybrid of salmon or trout may be imported into the State only by the holder of a fish importation permit and other required State permits. Importation permits shall be issued at no charge to a person who has applied on a Department special permit form, no less than 15 days nor more than 30 days before shipment, provided that the shipment is not considered detrimental to the fishery resource of the State.

An importation permit shall be issued only if the source hatchery is inspected and found free of those diseases designated by administrative rule of the Department, or any other diseases, that may be detrimental to the fishery resource of the State. Inspections may be carried out only by persons recognized by the Department as competent in the diagnosis of fish diseases (contact IDNR Program Manager for clarification). An importation permit may be granted by the Department for extended periods of up to 6 months from the date the source hatchery is certified as being disease free.

Importation permit requirements do not apply to salmon or trout in transit through the State that will not be released from their original containers.

(17 ILL. ADM.CODE sec 870.50)

Health certifications for salmonid importations include, but are not limited to: VHS, IHN, CS-ceratomyxosis, PKD.

The Department recognizes persons inspecting hatcheries using the methods of diagnosis found in "Suggested Procedures for the Detection and Identification of Certain Finfish and Shellfish Pathogens" 4th ed., Version 1 (1994), published by the Fish Health Section of the American Fisheries Society or the "Manual of Compliance to the Fish Health Protection Regulations of the Department of Fisheries and Oceans, Canada (1988).

Aquaculture facility permits

(515 ILCS 5/20-90)

Sec. 20-90. Aquaculture permits. Any person who shall engage in the breeding, hatching, propagation, or raising of aquatic life, whether indigenous or non-indigenous to this State, shall first procure a permit from the Department to do so. Aquatic life specified, which is bred, hatched, propagated or raised by a person holding a permit as provided for in this Section, may be transported and sold for food or stocking purposes. Permittees who sell aquatic life propagated or raised under this permit are exempt from possessing a fish or minnow dealers license.

Sec 870.30. Permit applicants wishing to import/possess aquatic life that appears on the Aquatic Life Approved Species List may apply for a permit prior to completion of their aquaculture facilities. Permit applicants wishing to import/possess aquatic life not on the Aquatic Life Approved Species List must have an aquaculture facilities plan completed and approved by the Department prior to issuance of the aquaculture permit. Such an issued permit is conditional, pending final inspection.

Non-resident fish dealer permits

Non-resident fish dealer permits allows a non-resident of IL to sell or ship to other wholsalers, retailers or consumers in IL any protected aquatic life. This is an annual permit with fee and expires on 1/31 of every year. Call DNR at 217/785-3423 or 217/782-2965 for application.

Restricted species transportation permits

Section 870.60

A restricted species transportation permit is required for live grass carp, bighead carp, silver carp, or hybrid grass carp. Restricted Species Transportation Permits are available from the Division of Fisheries, One Natural Resources Way, Springfield IL 62702-1271. Applications must be received by the Division of Fisheries at least two weeks prior to the proposed shipment date. A "Restricted Species Transportation Permit" shall be required for each shipment, except that extended permits covering regular periodic deliveries may be granted by the Department pursuant to Section 10-105 of the Fish and Aquatic Life Code. Triploid grass carp under 4 inches in length cannot be shipped, transported or stocked and may be possessed only by authorized aquaculture permit holders. Some exemptions exist for private lake and pond owners.

Resident retail and wholesale fish dealer permits

Resident retail fish dealer permits are required for IL residents conducting a retail fish market or selling from a truck aquatic life that are protected species and indigenous to Illinois. Resident Wholesale Fish Dealer is issued to IL residents conducting a wholesale fish market or selling aquatic life wholesale that are protected species and indigenous to Illinois. These are annual permits with fee expiring on 1/31 of every year. Call DNR at 217/785-3423 or 217/782-2965 for applications.

California

Bait Regulations for Inland Waters (CCR, T14, Chapter 2, Article 3)

4.00. BAIT-GENERAL.

Legally acquired and possessed invertebrates, mollusks, crustaceans, amphibians (except salamanders), fish eggs and treated and processed foods may be used for bait, except:

- (a) No species specified as endangered, threatened, candidate, fully-protected, or otherwise protected under state and federal law may be used as bait.
- (b) No salamander may be used as bait. See section 5.05 for other amphibians that may be used as bait.
- (c) See Section 5.35 for restrictions on crayfish;
- (d) See Section 7.50(b)(74) for restriction on bait collecting in Hat Creek;
- (e) No trout may be maintained or possessed in a live condition in any container on or attached to any boat;
- (f) Except for restrictions listed under special regulations, dead ocean fish may be used as bait statewide. This section supersedes the provisions of sections 4.10, 4.15, 4.20, 4.25 and 4.30.

4.05. BAIT FISH CAPTURE METHODS.

- (a) Approved bait fish may be taken only by hand, with a dip net, or with traps not over three feet in greatest dimension. Such bait fish may not be purchased, bartered, sold, transferred or traded; or transported alive from the location where taken. Any other species taken shall be returned to the water immediately. Traps need not be closely attended. Dip net use: A dip net must be hand held, and the motion of a dip net shall be caused only by the physical effort of the operator. A dip net may not be moved through the water by any mechanical force or motorized device.
- (b) Within the area bounded by Highway 111 on the north and east and Highway 86 on the west and south, approved bait fish may be taken only with dip nets with diagonal mesh size one inch and greater, or by traps in water greater than four feet in depth. Traps may not exceed three feet in greatest dimension. Approved bait fish may not be taken by hand within this area.

4.10. BAIT FISH USE IN THE SOUTHERN DISTRICT.

Except as provided below, live or dead fin fish shall not be used or possessed for use as bait in the Southern District:

- (a) Dead threadfin shad and live or dead longjaw mudsucker may be used in all Southern District waters.
- (b) Live threadfin shad may be used only at the location where taken.
- (c) Golden shiner and red shiner may be used in San Diego County.

4.15. BAIT FISH USE IN THE COLORADO RIVER DISTRICT.

Except as provided below, live or dead fin fish shall not be used or possessed for use as bait in the Colorado River District:

- (a) Live or dead golden shiner, fathead minnow, red shiner, mosquitofish, longjaw mudsucker, threadfin shad, goldfish, sunfish, molly, and dead carp may be used in all Colorado River District waters.
- (b) Live carp may be used only at the location where taken.
- (c) Tilapia may be used in the Salton Sea, and may be taken for bait only within the area bounded by Highway 111 on the north and east and Highway 86 on the west and south (except as in subsection (d) below.
- (d) Tilapia may be taken and used for bait in the Colorado River and its associated backwaters only within the area bounded by Palo Verde Diversion Dam south to the Morelos Dam.

NOTE: See subsection 4.05(b).

4.20. BAIT FISH USE IN THE VALLEY AND SOUTH CENTRAL DISTRICTS.

Except as provided below, live or dead fin fish shall not be used or possessed for use as bait in the Valley or South Central District:

- (a) Live or dead golden shiner, fathead minnow, mosquitofish, longjaw mudsucker, and staghorn sculpin, and dead threadfin shad, Mississippi silverside and lamprey may be used in all Valley and South Central District waters except those listed in subsection (f) below.
- (b) Red shiner may be used only in the Valley District north of Interstate 580 and Highway 132.
- (c) Yellowfin gobies may be used in the Valley District only in those areas described in subsections (d)(1)-(3) below.
- (d) In addition, except for trout and salmon, fin fish lawfully taken in the following waters by angling or with bait fish methods approved in Section 4.05 may be used only in the waters where taken:
    - (1) Carquinez Strait and Suisun Bay and their tributaries and saltwater tributaries.
    - (2) Sacramento River and tidewater of tributaries downstream from the Highway 32 bridge near Hamilton City, Feather River downstream from the Oroville Hatchery Fish Barrier Dam, and American River downstream from Nimbus Dam.
    - (3) San Joaquin River and tidewater of tributaries downstream from Interstate 5 bridge.
- (e) Live threadfin shad, Mississippi silverside and lamprey may be used only at the location where taken.
- (f) Fin fish may not be used in Keller Lake (Glenn Co.), Letts Lake (Colusa Co.), Merced Lake (San Francisco Co.), Upper and Lower Plaskett Meadow Ponds (Glenn Co.), Whale Rock Reservoir (San Luis Obispo Co.).

4.25. BAIT FISH USE IN THE NORTH CENTRAL DISTRICT.

Except as provided below, live or dead fin fish shall not be used or possessed for use as bait in the North Central District:

- (a) Golden shiner, fathead minnow, red shiner, mosquitofish, longjaw mudsucker and staghorn sculpin may be used in Napa and Sonoma counties, in Marin County except for Stafford Lake, in Lake County except for the Eel River and its tributaries, and in Lake Mendocino (Mendocino Co.).
- (b) Live threadfin shad, Mississippi silverside and lamprey may be used only at the location where taken.

4.30. BAIT FISH USE IN THE SIERRA AND NORTH COAST DISTRICTS.

Except as provided below, live or dead fin fish shall not be used or possessed for use as bait in the Sierra and North Coast Districts.

- (a) In Donner, Fallen Leaf and Tahoe lakes Lahontan redside, tui chub, Tahoe sucker, Lahontan speckled dace, mountain sucker and Paiute sculpin may be used only in the same lake where taken.
- (b) In Shasta Lake only golden shiner, red shiner, fathead minnows, mosquitofish and threadfin shad may be used or possessed for use as bait.
- (c) Crayfish shall not be used for bait in the Pit River and all tributaries between Pit 3 Dam (Lake Britton) and the Fall River-Cassel Road Bridge at Fall River Mills, California (includes Hat Creek and Fall River and their tributaries).

CALIFORNIA CODES
FISH AND GAME CODE
SECTION 6440-6460

6440. The Legislature finds and declares that triploid grass carp have the potential to contrd aquatic nuisance plants in non-public waters allowing for reduced chemical control but that thethreat that grass carp pose to aquatic habitat may outweigh its benefits. It is the intent of this section to allow the Department of Fish and Game to use its management authority to provide for the long-term health of the ecosystem in the state including the aquatic ecosystem, and in that context, manage grass carp either through control of movement, eradication of populations, acquisition of habitat and any other action that the department finds will maintain the biological diversity and the long term, overall health of the state's environment. The department shall undertake the management of grass carp in a manner that is consistent with provisions of this code and for the purposes of this section the department shall define management as handling, controlling, destroying, or moving species. The Legislature does not intend for this section to provide a right for the use of triploid grass carp if the department finds that use of the species poses an unacceptable risk to the state's existing ecosystem.

6450. The department shall adopt regulations that provide for the control of aquatic plant pests using artificially introduced triplod grass carp under a permit issued by the department. The regulations shall do all of the following:
(a) Restrict triploid grass carp introductions to those triploid grass carp that have been rendered sterile immediately after the eggs have been fertilized.
(b) Require individual fish to be checked to ensure that a third, triploid, set of chromosomes has been retained, preventing further reproduction by that individual fish.
(c) Limit aquatic plant pest control programs using triploid grass carp to the use of sterile triploid grass carp with documented certification of triploidy to ensure sterility.
(d) Require the identification by tagging of individual fish as the property of each owner.
(e) Require the posting of notices at stocked bodies of water declaring the penalties for removing triploid grass carp.
(f) Limit the permits for the use of triploid grass carp in waters on golf courses located in residential areas to those waters that are determined by the department to be secure from the removal of triploid grass carp to unauthorized waters.
(g) Provide for management of the triploid grass carp populations in a manner consistent with the provisions of this code where the department finds that such actions will benefit the long-term health of the state's biodiversity as a whole.
(h) Until January 1, 1999, the regulations shall not authorize the issuance of permits for the use of triploid grass carp in waters located within condominium areas of any residential area for which a permit may not be issued pursuant to subdivision (f) except at three locations within the area authorized pursuant to this subdivision. The three locations shall be selected by the department in consultation with the Imperial Irrigation District. The limitation to three locations is necessary to enable monitoring of human-induced movement of triploid grass carp to unauthorized waters and to permit the evaluation of the impact of the experiment.

6451. All providers of triploid grass carp for use under this article shall provide certification acceptable to the department of triploidy and disease-free conditions for all fish introduced.

6452. Prior to receiving a permit from the department to use triploid grass carp, the potential user shall provide to the department all of the information required by the department, including, but not limited to, the following:
(a) The type of waterway to be stocked.
(b) The site has no connections to adjacent fresh water systems.
(c) All aquatic plant management problems, including, but not limited to, the following:
(1) The acres of aquatic plants, by species, at the peak of

growing season.
(2) The desired vegetation quantity or coverage.
(3) The number and size of triploid grass carp recommended.
(4) All sensitive plant or animal species within the waterway to be stocked and any connected waterways.

6453. (a) On or before March 1 of each year following the first year after triploid grass carp introduction, the permittee shall provide to the department all of the information required by the department, including, but not limited to, the following:
(1) The number and size of triploid grass carp recommended for the waterway stocked.
(2) The number and size of triploid grass carp stocked in the waterway.
(3) The acres of aquatic plants, by species, at the peak of the growing season in the year prior to introduction of triploid grass carp in the waterway stocked.
(4) The acres of aquatic plants, by species, at the peak of the current year growing season.
(b) The annual report shall be submitted until five years after the use of triploid grass carp to control aquatic plant pests is terminated, unless evidence acceptable to the department is provided that all triploid grass carp have been removed from the waterway.

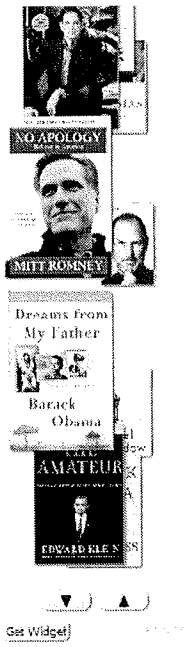
6454. The department shall establish permit and inspection fees sufficient to recover, but not exceed, the initial and ongoing costs of the program under this article.

6455. The department shall impose conditions in the permit to use triploid grass carp under this article that it finds necessary to prevent escape of the triploid grass carp from the targeted area. The conditions shall include, but are not limited to, the following:
(a) No permit shall be issued for the use of triploid grass carp in waters with an open fresh water connection to other waters of the state.
(b) Any waters in which triploid grass carp are used under this article shall be under the control of the permittee. In addition, barriers to fish movement acceptable to the department shall be in place before introduction of triploid grass carp under this article. Movement of triploid grass carp to areas outside the control of the permittee is prohibited.
(c) Any waters in which triploid grass carp are used under this article shall have sufficient dissolved oxygen and suitable vegetation for consumption to sustain the introduced triploid grass carp, as determined by the department.
(d) Except within closed basins, including the Salton Sea, no permit shall be issued for the use of triploid grass carp within the 100-year flood plain.
(e) Any person or persons engaging in the introduction of triploid grass carp into any area, or in the transfer of triploid grass carp from one site to another, without a permit from the department shall be punished by a fine of not more than five thousand dollars ($5,000), by imprisonment in the county jail for not more than one year, or by both that fine and imprisonment.

6456. Nothing in this article shall be construed as restricting grass carp programs approved by the department on or before June 1, 1995.

6457. Because of its experience and continuing involvement with hydrilla control programs, the implementation of Sections 6450 and 6454 shall be carried out in consultation with the Department of Food and Agriculture.

6460. If the department obtains documented and verifiable evidence of escapements of triploid grass carp permitted under this article into unauthorized waters, the unauthorized use of grass carp, or threats to fish and wildlife and their habitats as the result of this program, it may, upon a written finding by the director to that effect, suspend the permit issuance process authorized by this article. If the situation is local, the suspension may be limited to that area whose waters, habitat, and fish and wildlife resources are threatened. The suspension shall last until the director makes a written finding that the threat has been abated.



CALIFORNIA CODES
FISH AND **GAME CODE**
SECTION **6440**-6460

6440. The Legislature finds and declares that triploid grass carp have the potential to control aquatic nuisance plants in non-public waters allowing for reduced chemical control but that the threat that grass carp pose to aquatic habitat may outweigh its benefits. It is the intent of this section to allow the Department of Fish and **Game** to use its management authority to provide for the long-term health of the ecosystem in the state including the aquatic ecosystem, and in that context, manage grass carp either through control of movement, eradication of populations, acquisition of habitat and any other action that the department finds will maintain the biological diversity and the long term, overall health of the state's environment. The department shall undertake the management of grass carp in a manner that is consistent with provisions of this **code** and for the purposes of this section the department shall define management as handling, controlling, destroying, or moving species. The Legislature does not intend for this section to provide a right for the use of triploid grass carp if the department finds that use of the species poses an unacceptable risk to the state's existing ecosystem.

6450. The department shall adopt regulations that provide for the control of aquatic plant pests using artificially introduced triploid grass carp under a permit issued by the department. The regulations shall do all of the following:

(a) Restrict triploid grass carp introductions to those triploid grass carp that have been rendered sterile immediately after the eggs have been fertilized.

(b) Require individual fish to be checked to ensure that a third, triploid, set of chromosomes has been retained, preventing further reproduction by that individual fish.

(c) Limit aquatic plant pest control programs using triploid grass carp to the use of sterile triploid grass carp with documented certification of triploidy to ensure sterility.

(d) Require the identification by tagging of individual fish as the property of each owner.

(e) Require the posting of notices at stocked bodies of water declaring the penalties for removing triploid grass carp.

(f) Limit the permits for the use of triploid grass carp in waters on golf courses located in residential areas to those waters that are determined by the department to be secure from the removal of triploid grass carp to unauthorized waters.

(g) Provide for management of the triploid grass carp populations in a manner consistent with the provisions of this **code** where the department finds that such actions will benefit the long-term health of the state's biodiversity as a whole.

(h) Until January 1, 1999, the regulations shall not authorize the issuance of permits for the use of triploid grass carp in waters located within condominium areas of any residential area for which a permit may not be issued pursuant to subdivision (f) except at three locations within the area authorized pursuant to this subdivision. The three locations shall be selected by the department in

consultation with the Imperial Irrigation District. The limitation to three locations is necessary to enable monitoring of human-induced movement of triploid grass carp to unauthorized waters and to permit the evaluation of the impact of the experiment.

6451. All providers of triploid grass carp for use under this article shall provide certification acceptable to the department of triploidy and disease-free conditions for all fish introduced.

6452. Prior to receiving a permit from the department to use triploid grass carp, the potential user shall provide to the department all of the information required by the department, including, but not limited to, the following:

(a) The type of waterway to be stocked.

(b) The site has no connections to adjacent fresh water systems.

(c) All aquatic plant management problems, including, but not limited to, the following:

(1) The acres of aquatic plants, by species, at the peak of growing season.

(2) The desired vegetation quantity or coverage.

(3) The number and size of triploid grass carp recommended.

(4) All sensitive plant or animal species within the waterway to be stocked and any connected waterways.

6453. (a) On or before March 1 of each year following the first year after triploid grass carp introduction, the permittee shall provide to the department all of the information required by the department, including, but not limited to, the following:

(1) The number and size of triploid grass carp recommended for the waterway stocked.

(2) The number and size of triploid grass carp stocked in the waterway.

(3) The acres of aquatic plants, by species, at the peak of the growing season in the year prior to introduction of triploid grass carp in the waterway stocked.

(4) The acres of aquatic plants, by species, at the peak of the current year growing season.

(b) The annual report shall be submitted until five years after the use of triploid grass carp to control aquatic plant pests is terminated, unless evidence acceptable to the department is provided that all triploid grass carp have been removed from the waterway.

6454. The department shall establish permit and inspection fees sufficient to recover, but not exceed, the initial and ongoing costs of the program under this article.

6455. The department shall impose conditions in the permit to use triploid grass carp under this article that it finds necessary to prevent escape of the triploid grass carp from the targeted area. The conditions shall include, but are not limited to, the following:

(a) No permit shall be issued for the use of triploid grass carp in waters with an open fresh water connection to other waters of the state.

(b) Any waters in which triploid grass carp are used under this article shall be under the control of the permittee. In addition, barriers to fish movement acceptable to the department shall be in place before introduction of triploid grass carp under this article. Movement of triploid grass carp to areas outside the control of the permittee is prohibited.

(c) Any waters in which triploid grass carp are used under this article shall have sufficient dissolved oxygen and suitable vegetation for consumption to sustain the introduced triploid grass carp, as determined by the department.

(d) Except within closed basins, including the Salton Sea, no permit shall be issued for the use of triploid grass carp within the 100-year flood plain.

(e) Any person or persons engaging in the introduction of triploid grass carp into any area, or in the transfer of triploid grass carp from one site to another, without a permit from the department shall be punished by a fine of not more than five thousand dollars ($5,000), by imprisonment in the county jail for not more than one year, or by both that fine and imprisonment.

6456. Nothing in this article shall be construed as restricting grass carp programs approved by the department on or before June 1, 1995.

6457. Because of its experience and continuing involvement with hydrilla control programs, the implementation of Sections 6450 and 6454 shall be carried out in consultation with the Department of Food and Agriculture.

6460. If the department obtains documented and verifiable evidence of escapements of triploid grass carp permitted under this article into unauthorized waters, the unauthorized use of grass carp, or threats to fish and wildlife and their habitats as the result of this program, it may, upon a written finding by the director to that effect, suspend the permit issuance process authorized by this article. If the situation is local, the suspension may be limited to that area whose waters, habitat, and fish and wildlife resources are threatened. The suspension shall last until the director makes a written finding that the threat has been abated.

14 CA ADC § 5.37
§ 5.37. Grass Carp.

Term

14 CCR § 5.37

Cal. Admin. Code tit. 14, § 5.37

Barclays Official California Code of Regulations Currentness
Title 14. Natural Resources
Division 1. Fish and Game Commission-Department of Fish and Game
Subdivision 1. Fish, Amphibians and Reptiles
Chapter 2. Statewide Regulations for Fishing and Frogging in Inland Waters
Article 4. Species Regulations (Refs & Annos)
§ 5.37. Grass Carp.

(a) No grass carp may be taken or possessed at any time, except that any grass carp inadvertently taken must be immediately returned unharmed to the water.

(b) Exception for Siskiyou and Shasta Counties for any waters, within the Sacramento River drainage above and including Lake Shasta: All grass carp taken shall be killed immediately by removing the head and shall be retained by the angler. The angler shall notify the department that he/she has taken and possesses a grass carp by calling the department's telephone number (1-530-225-2278) as soon as possible, but not more than 24 hours after taking the grass carp.

Note: Authority cited: Sections 200, 202, 205 and 220, Fish and Game Code. Reference: Sections 200 and 205, Fish and Game Code.

HISTORY

1. New section filed 3-1-90; operative 3-1-90 (Register 90, No. 10).

2. Amendment filed 5-5-97; operative 6-4-97 (Register 97, No. 19).

3. Amendment designating first paragraph as subsection (a) and new subsection (b) filed 2-9-2010; operative 3-1-2010 pursuant to Government Code section 11343.4 (Register 2010, No. 7).

14 CCR § 5.37, **14 CA ADC § 5.37**

This database is current through 1/11/13 Register 2013, No. 2

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Term

14 CA ADC § 238.6
§ 238.6. Triploid Grass Carp Stocking.

Term

14 CCR § 238.6

Cal. Admin. Code tit. 14, § 238.6

Barclays Official California Code of Regulations Currentness
Title 14. Natural Resources
Division 1. Fish and Game Commission-Department of Fish and Game
Subdivision 1. Fish, Amphibians and Reptiles
Chapter 9. Aquaculture (Refs & Annos)
§ 238.6. Triploid Grass Carp Stocking.

Pursuant to Section 6450 of the Fish and Game Code, the department may issue permits to stock triploid grass carp.

(a) Purpose for Stocking. This section provides for the introduction of triploid grass carp, solely for the purpose of managing and controlling nuisance submerged aquatic plants. Triploid grass carp may only be stocked in waters approved by the department.

(b) To Whom Issued. Triploid grass carp stocking permits may be issued to a person, organization, or agency, to control or eradicate nuisance submerged aquatic plants, only within those waters under their control.

(1) Triploid grass carp stocking permits are not transferrable to persons, organizations, or agencies other than the permittee, except in the event that ownership of, or legal control over a water body named in the permit is transferred from the permittee to another person, organization, or agency. In this event, the permittee shall notify the department in writing within 10 (ten) days of the transaction. In addition, the permittee shall be responsible for informing the new owner of, or party assuming legal control over that water body, that triploid grass carp have been stocked therein. For the remaining term of the existing permit, said permit shall be transferred to the new owner of, or party assuming legal control over said water body, provided that said party agrees in writing to comply with the terms and conditions specified in this section. After expiration of the existing permit, the party assuming permittee status shall be required to renew the grass carp permit pursuant to subsection 238.6(e)(3)(B).

(2) Grass carp programs approved by the department on or before June 1, 1995 shall be exempt from the provisions of this section. Such programs shall be allowed to continue operations under a Private Stocking Permit (Form FG 749-(revised 5/93)), provided that the permittee: furnishes proof that the site had prior approval under a program approved by the department on or before June 1, 1995.

(c) Limitations.

(1) No permits shall be issued to stock grass carp in any major drainage or water having an open freshwater connection to other waters of the state (e.g., streams, rivers, lakes, or reservoirs).

(2) No permit shall be issued for grass carp introductions within the 100-year flood plain, as defined

by the Federal Emergency Management Agency (FEMA), or local agency responsible for flood control, with the following exceptions:

(A) Grass carp introductions may be permitted within closed basins, including that of the Salton Sea, subject to the conditions stated in subsections (c)(3) and (4), below.

(B) Along the Colorado River and in basins where the 100-year flood plain zones have not been defined, permit approval shall be based upon department evaluations.

(3) For water bodies open to public angling, or those located within residential-area golf courses, triploid grass carp introductions shall be limited to those waters which have been determined by the department to be secure from removal or escape of grass carp.

(4) No permit shall be issued for grass carp introductions into waters inhabited by plants or animals designated as threatened, endangered, or species of special concern.

(5) Only those grass carp which have been reared, held and transported in aquaculture facilities and equipment, inspected and certified by the department as being free of diseases and parasites may be stocked under the provisions of this section. In addition, the department shall:

(A) restrict grass carp introductions to those grass carp that have been rendered sterile immediately after the eggs have been fertilized,

(B) require individual fish to be checked to ensure that a third, triploid, set of chromosomes has been retained, preventing further reproduction by the individual fish,

(C) limit aquatic plant pest control programs using grass carp to the use of sterile triploid grass carp with documented certification of triploidy to ensure sterility, and

(D) inspect prospective grass carp aquaculture rearing facilities, holding facilities and transporters, to certify that they are free of diseases and parasites, and that they are secure from the escape of grass carp.

(6) Each triploid grass carp shall be implanted with serially-numbered tags provided or approved by the department.

(7) The department may limit the number and minimum size of triploid grass carp to be stocked in any proposed water. The number of triploid grass carp stocked may not exceed that specified on the permit, unless the permittee has obtained a department approved amendment to said permit.

(8) Security measures acceptable to the department shall be in place before triploid grass carp may be introduced into permitted waters. Such devices may include, but are not limited to, the following: fenced enclosures, locked gates, controlled access, and bird netting.

(9) Wherever barriers or screens are required to contain triploid grass carp within a proposed stocking site, the design for such structures must be approved by the department, and said structures shall be installed by the applicant prior to issuance of the Triploid Grass Carp Stocking Permit.

(10) Prior to stocking, permittee shall post prominent notices at each stocking site declaring the penalties for unauthorized removal of triploid grass carp.

(11) The permittee shall not place triploid grass carp in waters other than those specified in the permit.

(d) Permits.

(1) The term of the permit shall be one calendar year or remaining portion of the year.

(2) An amendment to change permit conditions may be issued by the department at any time during the term of the permit upon written request by the permittee, provided that such changes are consistent with the provisions of this section.

(3) The permittee shall retain a copy of the triploid grass carp stocking permit while grass carp are present in the permitted water. Said permit shall be available for presentation on request of any department employee.

(4) The department shall deny an application to stock triploid grass carp in any water body, if such proposed stocking is inconsistent with the provisions of this section.

(e) Application procedure. Applications shall be submitted on a form (Application for Triploid Grass Carp Stocking Permit for Aquatic Plant Management, FG 749-TGC (12/96), which is incorporated by reference herein) supplied by the department and may be filed with the department at any time. All applications shall be sent to the address indicated on the form and shall be submitted with appropriate application and inspection fees (see subsection (b)(3) below).

(1) Application Requirements. The applicant shall provide the following information, when requesting said permit, as well as when renewing an existing permit:

(A) Name, address, and affiliation of applicant.

(B) Location of the proposed stocking site.

(C) Number and type of water bodies to be stocked, and their sizes, in acres, or in square feet for waters less than one acre.

(D) Source of water supply and locations of water outlets, if applicable.

(E) A description of aquatic plant management problems, including but not limited to:

1. Type(s) of aquatic vegetation present, relative abundance of each, expressed as percentage of surface coverage, at the peak of the growing season.

2. Desired vegetation quantity or coverage.

(F) Number of triploid grass carp requested.

(G) Existing water quality data for the proposed water, if any.

(2) Inspection.

(A) Initial Inspection of Proposed Waters. All waters proposed for triploid grass carp stocking shall be subject to inspection by the department, to verify stocking is consistent with the provisions and limitations of this section, and to determine the number of triploid grass carp to stock.

(B) Periodic Follow-Up Inspections. All waters stocked with triploid grass carp shall be subject to inspection by department employees.

(3) Fees. The application and inspection fees shall be paid to the department at the time the Triploid Grass Carp Stocking Permit application is filed.

(A) Pursuant to Section 6454 of the Fish and Game Code, the department shall charge the following fees to defray costs incurred in the initiation and implementation of the Triploid Grass Carp Program:

1. Stocking fee: $15.00/fish, and

2. Annual renewal fee: $7.50/fish Note : The stocking fee will be assessed upon initial stocking and at any subsequent time that additional fish are added. Renewal fees are based on the number of fish remaining in the pond. The renewal fee is based on the presumption that no fish have been removed from the pond unless the permittee can provide proof acceptable to the department that fish have died or have been removed from the pond.

(B) All permits expire on December 31. Permits must be renewed by March 1 of the following year. If permit renewal fees are not received by the department on or before March 1, the department may eradicate all grass carp present in ponds for which permits have lapsed.

(f) Annual Reports.

(1) On or before March 1 of each year following the first year after triploid grass carp have been stocked, all permittees shall submit to the department a report documenting the progress of the aquatic vegetation control program in the permitted water. This report shall be submitted on a form furnished by the department (Triploid Grass Carp Stocking Permit Annual Report Form (FG 749-Rep (12/96)), which is incorporated by reference herein.

(2) Pursuant to Fish and Game Code subsection 6453(b), the permittee shall continue to submit annual reports until five years after the use of grass carp to control aquatic plant pests is terminated, unless acceptable evidence is provided to the department that all grass carp have been removed from the water.

(3) Permit amendments to stock triploid grass carp in excess of the number specified in the original permit shall be denied if the permittee fails to submit such reports.

(g) No live triploid grass carp shall leave the permittee's waters without advance approval in writing from the department.

(h) Permit Revocation.

(1) The department may revoke a Triploid Grass Carp Stocking Permit at any time upon its determination that the permittee has not complied with the terms and conditions of the permit, or if grass carp are used in any manner that is inconsistent with the provisions of this section.

(2) Upon revocation of the permit, all grass carp possessed under the privileges of the permit may be seized by the department for disposition deemed appropriate by the department.

Note: Authority cited: Sections 6450, 6454 and 6459, Fish and Game Code. Reference: Sections 6450-6460, Fish and Game Code.

HISTORY

1. New section filed 5-5-97; operative 6-4-97 (Register 97, No. 19).

2. Amendment of section and Note filed 4-24-2001; operative 5-24-2001 (Register 2001, No. 17).

14 CCR § 238.6, **14 CA ADC § 238.6**

This database is current through 1/11/13 Register 2013, No. 2

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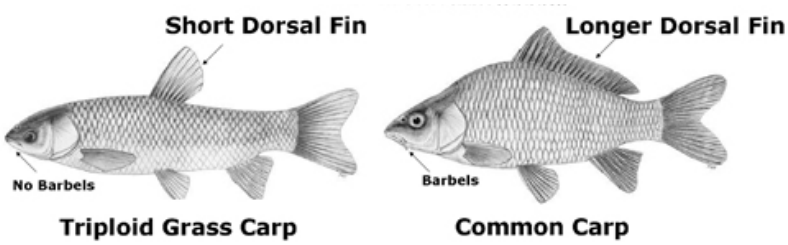
Common Questions and Answers

How can I tell the difference between common carp and the stocked triploid grass carp? Is it illegal to catch triploid grass carp that have been stocked in public waters?

The grass carp, also known as white amur, is a vegetarian fish native to the Amur River in Asia. The U. S. Fish and Wildlife Service introduced grass carp into the United States in 1963 for experimental purposes. Because this fish feeds on aquatic plants, it can be an effective biological tool for control of nuisance vegetation. It's easy to identify, just look at the information below and you can become proficient in the differences between the triploid and common carp!



The major difference when looking at the carp from above is the length of the dorsal fin. The triploid grass carp has a significantly shorter fin than the common carp. There are other more subtle differences the most easily identified of which is the presence or absence of barbels around the mouth.

Triploid grass carp are used around the world and are one of the approved methods being used by the SCDNR to control invasive and nuisance weeds in some of the public waters of South Carolina. The details of these methods can be found in the South Carolina Aquatic Plant Management Plan which is compiled yearly.

Please remember, it is illegal to "take" triploid grass carp from public waters according to section 50-13-1630(D) of the SC code of laws.

If you hook a triploid grass carp while fishing in public waters please release them back into the same water body. If you are bowhunting please remember if you shoot a triploid carp you have effectively "taken" the fish and can be subject to penalties prescribed by law.

Facts - triploid grass carp:

- offer a biological alternative for aquatic plant control.
- are sterile and will not reproduce.
- live for at least 10 years and probably longer in South Carolina waters.
- grow rapidly and may exceed 60 pounds.
- feed only on plants, not on fish eggs or young fishes.
- feed from the top of the plant downward
- have definite food preferences. Plants like water lilies, filamentous algae (pond scum or moss), muskgrass and Eurasian milfoil are not preferred. Bushy and American pondweeds and hydrilla are preferred foods.
- are not effective for control of bulrush, filamentous algae (pond scum or moss), water primrose, or cattails.
- go dormant during the winter and resume intensive feeding when water temperatures reach 68 degrees F.
- are difficult to catch with conventional fishing methods.

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http://www.dnr.sc.gov/invasiveweeds/question.html

http://www.scstatehouse.gov/code/t50c013.php

Title 50

Chapter 13

Article 11

SECTION 50-13-1630. Importing, possessing, or selling certain fish unlawful; special permits for research; Department to issue rules and regulations.

(A) A person may not possess, sell, offer for sale, import, bring, or cause to be brought or imported into this State or release into the waters of this State the following fish or eggs of the fish:

(1) carnero or candiru catfish (Vandellia cirrhosa);

(2) freshwater electric eel (Electrophorus electricus);

(3) white amur or grass carp (Ctenopharyngodon idella);

(4) walking catfish or a member of the clariidae family (Clarias, Heteropneustea, Gymnallabes, Channallabes, or Heterobranchus genera);

(5) piranha (all members of Serrasalmus, Rooseveltiella, and Pygocentrus genera);

(6) stickleback;

(7) Mexican banded tetra;

(8) sea lamprey;

(9) rudd (Scardinius erythrophtalmu-Linneaus); and

(10) snakehead (all members of family Channidae).

(B) The department may issue special import permits to qualified persons for research and education only.

(C)(1) The department may issue special permits for the stocking of sterile white amur or grass carp hybrids in the waters of this State. The special permits must certify that the permitee's white amur or grass carp hybrids have been tested and determined to be sterile. The department may charge a fee of one dollar for each white amur or grass carp hybrid that measures five inches or longer or twenty-five cents for each white amur or grass carp hybrid that measures less than five inches. The fee collected for sterility testing must be retained by the department and used to offset the costs of the testing.

(2) The department is authorized to promulgate regulations to establish a fee schedule to replace the fee schedule contained in item (1) of this subsection. Upon these regulations taking effect, the fee schedule contained in item (1) of

this subsection no longer applies.

(D) The department may issue special permits for the importation, breeding, and possession of nonsterile white amur or grass carp hybrids. The permits must be issued pursuant to the requirements contained in Chapter 18 of this title. Provided, however, that no white amur or grass carp hybrids imported, bred, or possessed pursuant to a special permit issued pursuant to this section may be stocked in the waters of this State except as provided in subsection (C) of this section.

(E) It is unlawful to take grass carp from waters stocked as permitted by this section. Grass carp caught must be returned to the water from which it was taken immediately.

(F) The department must prescribe the qualifications, methods, controls, and restrictions required of a person or his agent to whom a special permit is issued. The department must condition all permits issued under this section to safeguard public safety and welfare and prevent the introduction into the wild or release of nonnative species of fish or other organisms into the waters of this State. The department may promulgate regulations necessary to effectuate this section and specifically to prohibit additional species of fish from being imported, possessed, or sold in this State when the department determines the species of fish are potentially dangerous.

HISTORY: 1962 Code Section 28-704; 1970 (56) 1999; 1973 (58) 403; 1984 Act No. 365, Section 1; 1988 Act No. 481, Section 1; 1990 Act No. 462, Section 1; 1993 Act No. 54,Section 1; 1993 Act No. 181, Section 1263; 2001 Act No. 42, Section 1; 2003 Act No. 15, Section 1; 2008 Act No. 301, Section 1, eff June 11, 2008.

South Carolina Legislature

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DISCLAIMER

Title 50 - Fish, Game and Watercraft

CHAPTER 13.

PROTECTION OF FISH

ARTICLE 1.

GENERAL RESTRICTIONS ON FRESHWATER FISHING

SECTION 50-13-5. Omitted by 2012 Act No. 113, Section 1, eff July 1, 2012.

SECTION 50-13-10. Definitions.

The following definitions apply in this chapter as applicable:

(A) Equipment definitions:

(1) "Archery equipment" means a bow and arrow, long bow, recurve bow, compound bow, or crossbow.

(2) "Artificial lure" means manufactured or handmade flies, spinners, plugs, spoons, and reproductions of live animals, which are made completely of natural or colored wood, cork, feathers, hair, rubber, metal, plastic, tinsel, styrofoam, sponge, or string, or any combination of these materials, in imitation of or as substitute for natural bait. Lures or fish eggs enhanced with scents or salts are not artificial lures. Artificially produced organic baits are not artificial lures.

(3) "Cast net" means a nonbaited circular webbing having a weighted peripheral line that is thrown by hand and retrieved by a central line connected to radiating tuck lines attached to the peripheral line.

(4) "Crayfish trap" means a device constructed of coated wire with the opening of the throat or flues not exceeding two and one-quarter inches with a minimum mesh size of one-quarter inch bar mesh.

(5) "Creel" means anything used to hold or keep fish while afloat or afield.

(6) "Device" means an appliance or equipment or combination designed or used for taking or attempting to take fish.

(7) "Eel pot" means an enclosed structure used to take eels only and which conforms to the following specifications:

(a) no larger than twenty-four inches by forty-eight inches; and

(b) must be constructed of wire so that:

(i) the mesh size is no smaller than one-half by one-half inch, except for the throat or muzzle and the end opposite the throat or muzzle of cylindrical pots; and

(ii) a throat opening not to exceed two inches measured in any direction.

(8) "Elver fyke net" means a net with wings not exceeding ten feet in length and fourteen feet in depth; the distance from throat to cod end does not exceed twenty feet. The maximum bar mesh for any part of the net does not exceed one-eighth inch square.

(9) "Game fishing device" means a hook and line, pole or artificial pole, or rod and reel.

(10) "Gig" means a device consisting of a staff with a sharp point or points designed for thrusting and used to take fish by hand; to take fish by hand by use of a spear, prong, or similar device.

(11) "Gill net" means a net designed to hang vertically and capture fish by entanglement usually of the head, gill covers, or preopercles.

(12) "Hoop net" means a device in which fish are taken in an enclosed structure which conforms to the following specifications: the maximum size of hoop nets must be sixteen feet in length by five and one-half feet in diameter. Hoop nets must be made of a textile netting (no wire) of a mesh size not less than one inch square nor greater than two inches square enclosing a series of round hoops with two or more muzzle openings which must be made of a netting material. One side of the hoop must be flat to hold the nets in place.

(13) "Jug fishing" means fishing by use of a single hook and line attached to a floating device other than a flotation marker for trotlines, traps, or other devices.

(14) "Minnow seine" means a seine of a size not greater than four feet in depth by twenty feet in length with a mesh size of not more than one-fourth inch square mesh.

(15) "Minnow trap" means a cylindrical device not longer than twenty-four inches and no more than thirty inches in circumference or a rectangular device not larger than twenty-four inches long, eight inches high, and nine inches wide. The mesh must be no smaller than one-quarter inch bar mesh. The throat opening of the funnel of the trap may not exceed one inch in diameter.

(16) "Net" means an open work fabric or fiber woven or knotted at regular intervals; to catch or ensnare.

(17) "Pump net" means a manually operated dip-type net with webbing hung from rigid cross members that form an "X" which are attached to a pole. The pole utilizes a fulcrum to raise and lower the net. The "X" cross members may not exceed twenty feet. The net must be no smaller than one inch stretched mesh.

(18) "Seine" means a net having a stretch mesh of not less than one inch and not more than one and one-half inches which do not exceed seventy-five feet in length or six feet in depth.

(19) "Set hook" means a single hook and line set in or along any of the waters of this State used to catch fish while attached to bushes, limbs, vines, undergrowth, or other parts of vegetation, set poles, pegs, sticks, or similar structures. "Set hooks" include all similar hook and line devices by whatever name called.

(20) "Skimbow net" means a hand operated dip net constructed of wood with wire or textile netting with a mesh size not greater than one and one-half inches square hung within a frame formed by a length of wood looped and attached to itself to form a bow. The bow may not exceed fourteen feet in any direction

(21) "Single-hook artificial lure" means an artificial lure with a single point. A multiple number of single-hook lures (such as dropper flies) fished in a series is considered a single-hook artificial lure.

(22) "Spear" means a device for thrusting or throwing consisting of a long staff with a sharpened point or to which a sharp head is fixed.

(23) "Trap" means a device in which fish are taken in an enclosed structure which conforms to the following specifications and includes fish traps, baskets, and like devices:

(a) a trap must be made of:

(i) wire or textile material and be cylindrical in shape not more than six feet in length and not more than three feet in diameter or width;

(ii) the mesh size must not be smaller than one inch by one inch and there must be only one application of exterior wire to the trap; and

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http://legisweb.state.wy.us/statutes/statutes.aspx?file=titles/Title23/Title23.htm

CHAPTER 4 - PROTECTION AND PROPAGATION OF FISH
ARTICLE 1 - FISH HATCHERIES AND STOCKING

23-4-101. Fish stocking in waters without consent prohibited; penalties.

(a) No person shall plant or release any fish or fish eggs in any public waters of Wyoming without the consent and under the supervision of the department or its authorized personnel.

(b) The escape of lawfully stocked fish or fish eggs does not constitute a violation of this section.

(c)Violation of this section constitutes a high misdemeanor punishable as provided in W.S. 23-6-202(a)(ii).

(d) The court may, in its discretion, revoke any license issued under this act to any person convicted of a violation of this section, for the remainder of the year in which the conviction occurs, and may suspend the person's privilege to purchase or receive any other license under this act or to take any wildlife for a period of time up to and including lifetime revocation.

(e) In addition to any other criminal penalty provided in this act, any person who violates this section may be assessed civil penalties in an amount not to exceed the costs incurred by the commission in removing the fish or fish eggs from the waters affected by the violation. The commission may bring a civil action in any court of competent jurisdiction for civil penalties or injunctive relief.

23-4-202. Prohibition on aquatic invasive species; mandatory conveyance checks; reporting.

(a) No person shall:

(i) Launch any conveyance into the waters of this state without first complying with aquatic invasive species prevention requirements established by commission rule;

(ii) Possess, import, export, ship, transport or cause to be possessed, imported, exported, shipped or transported an aquatic invasive species in this state, except as authorized by the commission;

(iii) Introduce an aquatic invasive species into any waters of the state; or

(iv) Refuse to comply with the inspection requirements or any order issued under this article.

(b) A person who knows that an unreported aquatic invasive species is present at a specific location in this state shall immediately report that knowledge and all pertinent information to the commission or a peace officer.

WYOMING GAME AND FISH COMMISSION

CHAPTER 10

REGULATION FOR IMPORTATION, POSSESSION, CONFINEMENT, TRANSPORTATION, SALE AND DISPOSITION OF LIVE WILDLIFE

Section 1. Authority. This regulation is promulgated by authority of W.S. §23-1-102, §23-1-103, §23-1-302(a), (vi), (xii), (xv), (xxii) and (xxvi), §23-2-105, §23-2-208, §23-2-305, §23-3-116, §23-3-301, §23-3-302, §23-4-101, §23-4-102, §23-4-103, §23-4-201 through §23-4-205, §23-5-101, §23-5-201, §23-5-203 and §23-6-207.

Section 2. Regulation. The Wyoming Game and Fish Commission hereby adopts the following regulation governing importation, possession, confinement, transportation, sale and disposition of live wildlife. The Commission empowers the Department to administer and enforce this regulation. No person shall import, possess, confine, transport, sell, or dispose of live wildlife governed under this regulation, except as authorized by this regulation. The single game farm existing on or before January 1, 1975, as referred to in Wyoming Session Laws 1975, ch. 83, s2, shall only conduct operations under a permit issued by the Department and in accordance with this regulation. This regulation shall remain in effect until modified or repealed by the Commission.

Section 3. Purpose. Wildlife conservation within this State is the statutory responsibility, under Title 23, of the Wyoming Game and Fish Commission and the professional function of the Wyoming Game and Fish Department. Scientific data clearly demonstrates that importation, possession, confinement, transportation, sale and disposition of wildlife regulated by this Commission may result in disease, genetic, ecological, environmental, and other threats to Wyoming's wildlife resources. It shall be the purpose of this regulation to protect Wyoming's wildlife resources from these threats.

Section 4. Definitions. For the purpose of this regulation, definitions shall be as set forth in Title 23, Wyoming Statutes, and the Commission also adopts the following definitions:

(a) "Annual fish health inspection" means an on-site, annual formal inspection by an Inspecting Agent of all lots of fish at each facility or brood stock location. The inspection shall be designed to assay for pathogens listed as prohibited or notifiable. Said inspection shall be made in accordance with procedures listed in the latest edition of American Fisheries Society/Fish Health Section “Suggested Procedures for the Detection and Identification of Certain Finfish and Shellfish Pathogens” (Bluebook) or Appendix I of this regulation.

(b) "Approved laboratory" means a professional diagnostic or analytical laboratory qualified to conduct specific analyses and approved in advance by the Wyoming Game and Fish Department.

(c) “Approved laboratory technician” means an employee of an approved laboratory who is supervised by either an aquatic animal health inspector or fish pathologist and who is trained to collect non-lethal samples (collection of ovarian and seminal fluids) from fish brood stocks in accordance with procedures defined in the latest edition of “Suggested Procedures for the Detection and Identification of Certain Finfish and Shellfish Pathogens” (Bluebook) published by the Fish Health Section of the American Fisheries Society.

(d) "Cage and aviary birds" means those exotic captive-reared birds, such as parrots, exotic finches, and canaries, which are adapted to live and breed in a cage. For purposes of this regulation the monk parakeet (Myiopsitta monachus) is not a cage and aviary bird.

(e) "Carrier" means an individual which harbors the specific pathogen capable of causing disease but which shows no signs of the disease.

(f) "Certificate of veterinary inspection" means an official health certificate. It shall be a legible record covering the requirements of the State of Wyoming as listed in this regulation and as recorded on an official form from the state of origin and approved by the animal health official of the state of origin, or an approved form of the United States Department of Agriculture which shall be issued by an accredited, licensed veterinarian. All certificates of veterinary inspection shall be issued to comply in all respects with requirements of the State of Wyoming. The certificate of veterinary inspection shall delineate the total number of animals covered by the certificate. It shall indicate the health status of the animals involved, including dates and results of required tests and vaccinations, the mailing addresses of the consignor and consignee, the origin of the wildlife, their actual Wyoming destination, and an accurate description including proper taxonomic identification with genus and species names. It shall designate the official ear tag number, individual animal tattoo, individual animal brand, individual animal number, or similar individual identification of each animal. A certificate of veterinary inspection may also mean a fish health inspection report. This shall be a report signed by an aquatic animal health inspector or fish pathologist (as applicable) which documents the last known disease status of all lots of fish at a facility (or a wild, free-ranging brood stock) resulting from on-site inspection, sampling, and subsequent examination of the collected tissues and fluids for the detection of disease agents listed in this regulation.

(g) "Commercial use" means utilizing wildlife in sale, trade, barter, brokerage, or other commerce.

(h) "Department" means the Wyoming Game and Fish Department whose mailing address is: 5400 Bishop Boulevard, Cheyenne, WY 82006, or 3030 Energy Lane, Casper, WY 82604.

(i) "Dog field trial" means and includes any trial held under rules of a dog or kennel club for the purpose of gaining points toward a championship; and any practice or training trial where there is organized competition and training of dogs for the purpose of preparing for a trial.

(j) "Dog training" means the activity of training or teaching dogs to hunt game birds by the use of pen-raised game birds.

(k) "Domestic animals" means those populations of animals which through long association with humans have been bred to a degree which has resulted in genetic changes affecting the color, temperament and conformation, or other attributes of the species to an extent that makes them unique and distinguishable from wild individuals of their species. For the purpose of this regulation, only the following animals are considered domestic:

- ass, burro, and donkey (Equus asinus),
- bison (Bison bison); except those classified as wild bison by the Wyoming Game and Fish Commission and the Wyoming Livestock Board within Wyoming are not domestic,
- cat (Felis catus),
- domestic cattle (Bos taurus and Bos indicus),
- domestic chicken (Gallus gallus),
- dog (Canis familiaris),
- domestic ferret (Mustela furo),
- domestic goat (Capra hircus),
- domestic greylag goose (Anser anser),
- horse and pony (Equus caballus),
- domestic mallard (Anas platyrhynchos) distinguished morphologically from wild mallards and pen raised mallards routinely utilized for dog training,
- mule and hinny (Equus asinus x Equus caballus),
- domestic muscovy duck (Cairina moschata),
- pigeons (Columba livia),
- domestic sheep (Ovis aries), distinguished morphologically from wild sheep,
- domestic swan goose (Anser cygnoides),
- domestic swine (Sus domesticus),
- domestic turkey (Meleagris gallopavo) distinguished morphologically from wild turkeys.

(l) "Domesticated animals" means those individual animals which have been made tractable (easily managed or controlled) or tame. For the purpose of this regulation, only the following animals are considered domesticated:

- domesticated alpaca (Lama pacos),
- domesticated camel (Camelus bactrianus and Camelus dromedarius),
- domesticated chinchilla (Chinchilla laniger),
- domesticated emu (Dromaius novaehollandiae),
- domesticated European rabbit (Oryctolagus cuniculus),
- domesticated Mongolian gerbil (Meriones unguiculatus),
- domesticated guinea fowl (Numida meleagris),
- domesticated guinea pig (Cavia porcellus),
- domesticated hamster (Mesocricetus auratus),
- domesticated llama (Lama glama),
- domesticated mouse (Mus musculus),
- domesticated ostrich (Struthio camelus),
- domesticated peafowl (Pavo cristatus),
- domesticated rat (Rattus norvegicus and Rattus rattus),
- domesticated rhea (Rhea americana and Rhea pennata),
- domesticated vicuna (Vicugna vicugna),
- domesticated yak (Bos grunniens).

(m) "Endangered and threatened wildlife" means wildlife listed in the Federal "List of Endangered and Threatened Wildlife" as published in the Federal Register and referred to as Title 50 Code of Federal Regulations, Part 17, Section 11 (50 CFR 17.11) dated October 1, 2002, and which does not include any later amendments or editions of the incorporated matter.

(n) “Falconry” means the sport of taking quarry by means of a trained raptor.

(o) “Falconry training” means the activity of training or teaching raptors to hunt game birds by the use of pen-raised game birds.

(p) "Fish or gamete source" means any source that supplies live fish, fertilized eggs, or gametes to any facility or water in the State of Wyoming.

(q) "Aquatic animal health inspector" means any individual approved by the Department whose qualifications meet standards established by the Board of Certification of the Fish Health Section of the American Fisheries Society for certification as an aquatic animal health inspector.

(r) "Fish health inspection report" means certificate of veterinary inspection.

(s) "Fish pathologist" means any individual approved by the Department whose qualifications meet standards established by the Board of Certification of the Fish Health Section of the American Fisheries Society for certification as a fish pathologist.

(t) "Game farm" means the single game farm existing on or before January 1, 1975, the NX Bar Ranch previously owned by Allen O. Fordyce (herein referred to as "the NX Bar Game Farm"), which is the game farm operation referenced in Wyoming Session Laws 1975, ch. 83, s2.

(u) "Holding facility(ies)" or "facility" means the physical structure designed to confine and handle live wildlife. The holding facility shall be defined by legal description to the quarter/quarter section or Universal Transverse Mercator (UTM) coordinates where live wildlife shall be possessed or confined. Facility also means any fish hatchery, rearing station, aquaculture station or unit, research unit, live car or net-pen, brood stock trap, or holding pond or structure where fish eggs are collected, incubated, or hatched, or where fish are held or reared for any purpose.

(v) "Hybrid" means an animal produced by crossing species or subspecies.

(w) "Import/importation" means to bring or cause live wildlife to be brought into Wyoming by any means.

(x) "Importation/possession permit" or "Permit" means a written permit issued by the Commission through the Department to allow importation, possession, confinement, transportation, or disposition of wildlife. A permit may also mean a Wyoming Game and Fish Department Permit for interstate transportation of live wildlife. An interstate transportation permit shall only allow transportation of live wildlife through the State of Wyoming for a period not to exceed twenty-four (24) consecutive hours from the time of issuance.

(y) "Inspecting agent" means any individual approved by the Department who is certified as an aquatic animal health inspector, a fish pathologist or qualified as an approved laboratory technician.

(z) "Institution of higher education" means the University of Wyoming and community colleges within Wyoming as defined in Wyoming Statute §21-16-501.

(aa) “Isolation facility” means a fish culture unit operated by a public entity for the quarantine of fish or fish gametes for brood stock development of wild or endemic populations. The unit shall be self-contained and isolated from other fish culture facilities with controlled access for quarantine of fish products and disease prevention.

(bb) "Lot" means a group of fish of the same species and age group originating from the same spawning population, and sharing the same water supply. Various year

classes may comprise the same lot under certain conditions. For example: Yearlings and two (2) year old progeny may be considered the same lot as the adult, spawning brood stock provided the other criteria in the definition are present. Also, fish of the same species but from different spawning populations, adequately inspected, then combined into one group may henceforth be regarded as one, single lot as long as they continue to share the same rearing space.

(cc) "Marine fish" means those fish capable of living only in salt water. For purposes of this regulation, fish that migrate between fresh and salt water as part of their life history (anadromous and catadromous) are not marine fish.

(dd) "Molluscicide" means an agent that kills mollusks, i.e., snails and slugs.

(ee) "Optimal time for detection" means that season of the year or life-stage of fish where a disease is most likely to occur or that is most conducive to the detection of pathogens.

(ff) "Pathogen" means one of the following: 1) "Notifiable pathogen" means a pathogen of special concern, as determined by the Wyoming Game and Fish Department, capable of causing fish losses and which is treatable or manageable through existing technology or effective management at fish culture facilities; 2) "Prohibited pathogen" means a pathogen capable of causing significant mortality and fish health problems, as determined by the Wyoming Game and Fish Department, and for which the only known means of control are avoidance and eradication; 3) "Reportable pathogen" means all pathogens or diseases not listed in the prohibitive, or notifiable categories.

(gg) "Pen-raised game bird" means a privately-owned game bird that is legally in possession of the holder of an importation/possession permit.

(hh) "Permittee" means the person in whose name a permit has been issued by the Department authorizing importation, possession, confinement, transportation, or disposal of wildlife.

(ii) "Possess/possession" means to have physical control or domination over wildlife with or without ownership; this includes confinement or transportation of live wildlife; possession also includes constructive possession which means not actual but assumed to exist, where one claims to hold by virtue of some title, without having actual custody.

(jj) "Prevalence" means the proportion or percent of cases of a disease, or a disease agent, present in a population at a given time.

(kk) "Quarantine" means a holding facility, approved in advance by the Department, constructed to prevent contact between quarantined wildlife and any other

animals, to prevent escape of quarantined wildlife, and to allow humane restraint and handling of quarantined wildlife. Quarantine may also refer to the period of time during which an animal(s) is confined in a quarantine facility. 1. "Pre-entry quarantine" means a quarantine facility in the state of origin of wildlife to be imported. The quarantine facility shall be approved in advance by the Wyoming Game and Fish Department or the Department's designated animal health official in the state of origin of wildlife to be imported. Usually pre-entry quarantine is on the premise of origin. Pre-entry quarantine is always the last place of confinement immediately before wildlife are shipped directly to Wyoming; or the period of time during which an animal(s) is confined in a pre-entry quarantine facility. 2. "Post-entry quarantine" means a quarantine facility in Wyoming approved in advance by the Wyoming Game and Fish Department. Usually post-entry quarantine is on the premise of destination. Post-entry quarantine is always the first place of confinement after wildlife are shipped directly to Wyoming; or the period of time during which an animal(s) is confined in a post-entry quarantine facility.

(ll) “Raptor” means a live bird of the Order Falconiformes (commonly called vultures, hawks, falcons and eagles) other than a turkey vulture (Cathartes aura), an osprey (Pandion haliaetus), or a bald eagle (Haliaeetus leucocephalus).

(mm) "Reasonable action" means any action which may include sampling and clinical inspections which are known to be scientifically acceptable (as listed in this regulation) including taking of wildlife, fish stock destruction or other disposal, quarantine, pathogen eradication and facility disinfection and which is determined to be consistent with the risk or severity of the wildlife health issue and the likelihood of a successful solution.

(nn) "Species" means the biological classification of individuals having common attributes, potentially capable of interbreeding under natural conditions but usually not with members of another species, and designated by a binomial consisting of genus and specific names decided upon by recognized scientific authorities.

(oo) "Tropical fish" means those fish whose survival in water temperatures below fifty (50) degrees Fahrenheit is not documented in scientific literature.

(pp) "Wild" means all those animals not defined as domestic or domesticated in this regulation.

(qq) "Wildlife" means every wild mammal, bird, fish, amphibian, reptile, mollusk, crustacean, their viable gametes (eggs and sperm), fertilized eggs, or any hybrid (including hybrids between wildlife and wildlife and hybrids between wildlife and domestic or domesticated animals) or any transgenic product thereof.

(rr) “Wolf hybrid” means any animal produced by crossing a wolf with a dog or another species or subspecies.

Section 5. Importation/Possession Permit Required For Live Wildlife. Except as exempted in this regulation, a permit from the Department is required prior to importation, possession, confinement, or transportation of any living wildlife. Any living wildlife may be transported through the state of Wyoming if the person transporting said wildlife is in possession of a valid permit for interstate transportation of live wildlife. An interstate transportation permit shall be valid as long as live wildlife are confined within the conveyance. It is a violation of this regulation to intentionally or unintentionally release within Wyoming any wildlife held under an interstate transportation permit.

(a) Importation/Possession Without Permit. The animals listed in this subsection are exempt from this regulation and may be imported, possessed, transported, or confined without securing a permit from the Department. (However, the Wyoming Livestock Board should be contacted regarding their regulations.)

(i) Birds

- cage and aviary birds,
- domestic chicken (Gallus gallus),
- domesticated emu (Dromaius novaehollandiae),
- domestic greylag goose (Anser anser),
- domesticated guinea fowl (Numida meleagris),
- domestic mallard (Anas platyrhynchos) distinguished morphologically from wild mallards,
- domestic muscovy duck (Cairina moschata),
- domesticated ostrich (Struthio camelus),
- domesticated peafowl (Pavo cristatus),
- pigeons (Columba livia),
- domesticated rhea (Rhea americana and Rhea pennata),
- domestic swan goose (Anser cygnoides),
- domestic turkey (Meleagris gallopavo) distinguished morphologically from wild turkeys,
- predacious birds as defined in Wyoming Statute §23-1-101(i)(vii): English (house) sparrow (Passer domesticus) and starling (Sturnus vulgaris).

(ii) Mammals

- domesticated alpaca (Lama pacos),
- ass, burro, and donkey (Equus asinus),
- bison (Bison bison); except those classified as wild bison by the Wyoming Game and Fish Commission and the Wyoming Livestock Board,
- domesticated camel (Camelus bactrianus and Camelus dromedarius),
- cat (Felis catus),

· domestic cattle (Bos taurus and Bos indicus),
· domesticated chinchilla (Chinchilla laniger),
· dog (Canis familiaris),
· domestic ferret (Mustela furo),
· domesticated Mongolian gerbil (Meriones unguiculatus),
· domestic goat (Capra hircus),
· domesticated guinea pig (Cavia porcellus),
· domesticated hamster (Mesocricetus auratus),
· horse and pony (Equus caballus),
· domesticated llama (Lama glama),
· domesticated mouse (Mus musculus),
· mule and hinny (Equus asinus x Equus caballus),
· domesticated European rabbit (Oryctolagus cuniculus),
· domesticated rat (Rattus norvegicus and Rattus rattus),
· domestic sheep (Ovis aries), distinguished morphologically from wild sheep,
· domestic swine (Sus domesticus),
· domesticated vicuna (Vicugna vicugna),
· domesticated yak (Bos grunniens).

· predatory animals, excluding wolves and wolf hybrids, as defined in Wyoming Statute §23-1-101(a)(viii): coyote (Canis latrans), jackrabbit (Lepus townsendi and Lepus californicus), porcupine (Erethizon dorsatum), raccoon (Procyon lotor), red fox (Vulpes vulpes), skunk (Mephitis mephitis and Spilogale putorius). Wolves (Canis lupus) or wolf hybrids may not be possessed, imported or sold.

(b) Live wildlife listed in this subsection (excluding any that are endangered or threatened), may be imported, possessed, confined or transported without securing a permit from the Department under this regulation as long as wildlife are held in compliance with appropriate Commission regulations and Wyoming Statutes. A certificate of veterinary inspection shall be issued prior to live wildlife listed in this subsection being imported into the State of Wyoming, unless otherwise specified in this regulation. The Wyoming Game and Fish Commission may consider an application for importation or possession of any animals listed in this subsection that are endangered or threatened by governmental entities, or institutions of higher education for education or research, or to meet Department wildlife management goals, when a need is demonstrated by the applicant.

(i) It is a violation of this regulation to release, abandon or allow to escape any live wildlife listed in this subsection without prior written authorization from the Department, except as may be provided by Wyoming Statutes or other Commission regulations. All live wildlife released or abandoned without written authorization from the Department may be taken by Department personnel.

(A) Amphibians. All amphibians, except that the importation or possession of the Manitoba toad (Bufo hemiophrys) is prohibited; certificate of veterinary inspection is not required. Amphibians shall not be imported into the State for use as live fishing bait.

(B) Birds

(I) Hawks or falcons, legally imported, possessed, confined or transported under terms of Wyoming Statute §23-2-105 and Wyoming Game and Fish Commission Regulation, Chapter 25, Falconry Regulation or Chapter 37, Raptor Propagation Regulation; certificate of veterinary inspection is not required,

(II) Game birds legally imported, possessed, confined or transported under terms of Wyoming Statute §23-5-102 and Wyoming Game and Fish Commission Regulation, Chapter 40, Regulation Governing Commercial Game Bird Farms,

(C) Crustaceans and Mollusks. All crustaceans and mollusks, except that the importation or possession of the rusty crayfish (Orconectes rusticus), New Zealand mudsnail (Potamopyrgus antipodarum), Asian Clam (Corbicula fluminea), quagga mussel (Dreissena rostriformis) or the zebra mussel (Dreissena polymorpha) is prohibited; all crustaceans and mollusks must be confined in aquariums; certificate of veterinary inspection is not required. Crustaceans and mollusks shall not be imported into the State for use as live fishing bait.

(D) Fish

(I) Fish imported, possessed, or transported under terms of Wyoming Statutes relating to private fish hatcheries, private fishing preserves, live bait fish dealers, and landowner fishing lakes and ponds provided the fish are certified disease free as specified in Appendix I of this regulation and are of a species compatible with existing wildlife as determined by the Department. The fish must be accompanied by the appropriate authorization, receipt or license as required by Commission regulation. (Refer to Wyoming Game and Fish Commission Regulations, Chapter 46 Fishing Regulations, Chapter 49 Regulation Governing Private Fish Stocking, Chapter 50 Regulation Governing Fishing Preserves, Chapter 51 Regulation Governing Private Fish Hatcheries, Chapter 53 Regulations Governing Landowner Fishing Lakes or Ponds and Chapter 62 Regulation for Aquatic Invasive Species),

(II) Importation or possession of diploid grass carp (Ctenopharygodon idella), bighead carp (Hypophthalmichthys nobilis), silver carp (Hypophthalmichthys molitrix) and black carp (Mylopharyngodon piceus) are prohibited.

(III) Importation or possession of certified triploid grass carp (Hypophthalmichthys nobilis) requires permit approval through Chapter 49, Regulation Governing Private Fish Stocking,

(IV) Goldfish (Carassius auratus); all goldfish must be confined in aquariums; certificate of veterinary inspection is not required,

(V) Marine fish; all marine fish must be confined in aquariums; certificate of veterinary inspection is not required,

(VI) Tropical fish; all tropical fish must be confined in aquariums; certificate of veterinary inspection is not required.

(E) Mammals: sugar gliders (Petaurus breviceps); hedgehogs (Erinaceus spp.); and pot-bellied pigs (Sus scrofa vittatus); certificate of veterinary inspection is not required.

(F) Reptiles: all reptiles; certificate of veterinary inspection is not required. Reptiles shall not be imported into the State for use as live bait for fishing.

(G) The Department may allow the importation, possession, confinement or transportation without securing a permit under this regulation of any captive reared live wildlife that are adapted to live and breed in a cage or aquarium and that are normally sold through commercial pet stores providing the Department is satisfied that such wildlife does not threaten Wyoming's wildlife resources as listed in Section 6(b)(viii) of this regulation. The Department may require a certificate of veterinary inspection for such wildlife.

(c) Importation/Possession Permit Required. The following live wildlife may be possessed without a permit if captured in the State of Wyoming, but shall not be imported prior to securing a permit under this regulation. A permit shall be required to take wildlife listed in this section for commercial use.

(i) All wildlife listed in Section 6 of the Wyoming Game and Fish Commission Regulation, Chapter 52, Nongame Wildlife Regulation. However, mollusks (excluding Asian Clam (Corbicula fluminea), quagga mussel (Dreissena rostriformis), zebra mussel, (Dreissena polymerpha), New Zealand mudsnail (Potamopyrgus antipodarum)), crustaceans (excluding rusty crayfish, (Orconeates rusticus)), reptiles and amphibians (excluding Manitoba toad, (Bufo hemiophrys)) may be imported without a permit.

(d) Wildlife Prohibited from Importation/Possession.

(i) Wyoming Statute §23-1-103 states: "There shall be no private ownership of live animals classified in this act as big or trophy game animals or of any wolf or wolf hybrid". Big game animals are defined in Wyoming Statute §23-1-101 (a) (i) as follows: antelope (pronghorn, Antilocapra americana), bighorn sheep (Rocky Mountain bighorn sheep, Ovis canadensis), deer (mule deer, Odocoileus hemionus and white-tailed deer Odocoileus virginianus), elk (Cervus elaphus nelsoni), moose (Alces alces), or mountain goat (Oreamnos americanus). Trophy game animals are defined in Wyoming Statute §23-1-101 (a) (xii) as follows: black bear (Ursus americanus), grizzly bear (Ursus arctos) or mountain lion (Felis concolor).

(ii) In addition, a permit shall not be issued for importation or possession of the following live wildlife in Wyoming:

(A) All members of the family Suidae, except those exempt in Section 5(a)(ii) and Section 5(b)(i)(E),

(B) All members of the order Rodentia from Africa, including but not limited to Tree squirrels (Heliosciurus sp.); Rope squirrels (Funisciurus sp.); Dormices (Graphiurus sp.); Gambian Giant Pouched Rats (Cricetomys sp.); Brush-tailed porcupines (Atherurus sp.); Striped mice (Hybomys sp.).

(C) All members of the family Tayassuidae,

(D) All members of the subfamily Alcelaphinae,

(E) All members of the subfamily Caprinae, except those exempt in Section 5(a)(ii),

(F) All members of the family Cervidae, except as provided for under Section 12 of this regulation,

(G) Asian Clam (Corbicula fluminea),

(H) Manitoba toad (Bufo hemiophrys),

(I) Monk parakeet (Myiopsitta monachus),

(J) New Zealand mudsnail (Potamopyrgus antipodarum),

(K) Quagga Mussel (Dreissena rostriformis)

(L) Red Wolf (Canis rufus),

(M) Rusty crayfish (Orconectes rusticus),

(N) Wild turkey (Meleagris gallopavo),

(O) Zebra mussel (Dreissena polymorpha) may not be imported.

(iii) The Wyoming Game and Fish Commission may consider an application for importation or possession of these animals listed in this subsection by governmental entities, or institutions of higher education for education or research or to meet Department wildlife management goals, when a need is demonstrated by the applicant.

Section 6. Application and Importation/Possession Permit Requirements. Permits may be issued by the Commission through the Department to import, possess, transport or confine live wildlife subject to the provisions of this regulation. Section 6 shall not apply to the NX Bar Game Farm subject to Section 12. Holders of permits for interstate transportation must only comply with subsections (a), (b) (i)(ii)(iii)(iv)(xi), (e), (f), (g), (j) of this section.

(a) As a condition of receiving a permit, the permittee shall agree to be solely responsible for all costs, expenses, and damages suffered as a result of importation and possession of wildlife including, but not limited to quarantine or total or partial depopulation on account of contagious diseases or parasites; or costs and expenses associated with the capture of or destruction of escaped wildlife.

(b) Application for a permit shall be submitted to the Department on a form provided by the Department. The application shall be legible, fully completed, and include all of the following:

(i) The name, complete mailing address, street address, and telephone number of the person making application for a permit,

(ii) A separate application shall be submitted for each species or subspecies,

(iii) The total number of live wildlife to be imported and possessed and their taxonomic designation by genus, species, and subspecies to include any varieties, strains, or geographical races that are recognized,

(iv) The name and address of the supply source(s), or consignor from which the live wildlife shall be obtained,

(v) The purpose(s) for which live wildlife shall be imported or possessed,

(vi) A complete description of the holding facility(ies) to include, but not limited to, the geographic legal description to the quarter/quarter section, fencing specifications and design, size and construction specifications for enclosures and handling facilities,

(vii) A description of the type of tattoo or permanent marking that is proposed by the applicant to be utilized on all wildlife, if such a tattoo or permanent marking is required by the Department,

(viii) Scientific data including, but not limited to, biological evaluations, reports, and studies in order to satisfy any Department concerns that Wyoming wildlife resources shall be adequately protected from such threats as:

(A) Competition, damage, or destruction of habitat,

(B) Disruption of migration, breeding, rearing or survival of young,

(C) Predation,

(D) Disease or Parasitism,

(E) Hybridization.

(ix) Certification that the proposed possession of wildlife is not contrary to the laws of the appropriate County or Municipality where wildlife will be possessed, or any other applicable laws or covenants;

(x) The application shall be signed and dated by the applicant;

(xi) Incomplete applications shall not be considered by the Department.

(c) The Department shall review the applicant's proposed holding facility(ies) taking into consideration the species applied for, the number of animals requested, the welfare of the animals to be possessed, the purpose(s) for which the animals shall be held, and to insure adequate protection for Wyoming's wildlife resources and human health and safety. Holding facilities shall be constructed to meet Department approval prior to importation or possession of live wildlife.

(i) All wildlife, except as exempt in Section 5(b)(i)(G), shall be kept within wildlife holding enclosure(s) except when being transported, transferred or treated. The holding facility(ies) shall be designed, constructed and maintained to provide:

(A) Safety and protection for wildlife and people;

(B) Facility(ies) shall ensure containment for wildlife and exclusion of other wild and domestic animals;

(C) Sufficient space to allow normal development and physical behavior, as well as postural and social adjustments with freedom of movement;

(D) Proper lighting levels;

(E) Proper ventilation;

(F) Ability for the permittee to conduct cleaning, sanitation, disinfecting and handling procedures considering safety, escape prevention and while minimizing stress to wildlife;

(G) Appropriate ambient temperatures;

(H) Barriers to minimize stress to captive wildlife;

(I) Parasite and pest control;

(J) Shelter within enclosure(s) as needed;

(K) Clean water and appropriate food;

(L) Nesting or bedding materials; and,

(M) The facility(ies) shall be kept clean and sanitary.

(d) The applicant shall be furnished written notification of action on the application for a permit by the Department.

(e) Prior to receiving a permit, all appropriate Federal regulations and requirements shall be satisfied. Proof of compliance shall be submitted before a permit may be issued.

(f) A permit or renewal shall be denied or conditioned if necessary to adequately protect Wyoming's wildlife resources from threats, including but not limited to:

(i) Competition, damage, or destruction of habitat,

(ii) Disruption of migration, breeding, or rearing and survival of young,

(iii) Predation,

(iv) Disease or Parasitism,

(v) Hybridization.

(g) If a permit is issued, the permittee shall obtain the appropriate certificate of veterinary inspection satisfying the requirements of Appendix I or II prior to importation. In addition the permittee shall comply with all of the provisions of this regulation relating to the type of wildlife for which applied prior to importation, possession, confinement, or transportation of live wildlife.

(h) Applications to possess elk (Cervus elaphus) shall only be accepted from governmental entities, or institutions of higher education for education or research, or to meet Department wildlife management goals, when a need is demonstrated by the applicant. All elk shall be tested prior to importation following procedures listed in Appendix II of this regulation to determine that animals are not hybrids. Prior to issuance of a permit, the permittee shall provide the Department with test results. Only pure Rocky Mountain elk (Cervus elaphus nelsoni) may be permitted for importation, except the Wyoming Game and Fish Commission may consider an application for importation or possession of other subspecies of elk by governmental entities or institutions of higher education for education or research, or to meet state wildlife management goals when a need is demonstrated by the applicant. The permittee shall allow the Department or the Department's designated agent to take blood samples from all elk imported into Wyoming within fourteen (14) days following importation or prior to removal of the elk from the holding facility, whichever is earlier, in order to establish genetic marking of each elk. Department ear tags shall be placed in each elk by Department personnel or the designated agent of the Department within fourteen (14) days following importation or prior to removal of elk from the holding facility, whichever is earlier.

(i) As a condition of a permit to import, possess, or confine live wildlife, a permittee may be required to permanently identify all live wildlife and their progeny according to Department specifications within fourteen (14) days following the importation or possession or prior to removal from the holding facility, whichever occurs earlier.

(j) Each container of live wildlife imported into or transported within or through Wyoming shall bear the names and addresses of the consignor and the consignee. Each container shall have a label that clearly describes its contents. Each shipment shall be accompanied by a certificate of veterinary inspection that meets the requirements of this regulation. There shall be a copy of the certificate of veterinary inspection in each and every conveyance. Owners and operators of railroads, trucks, airplanes or other conveyances shall be forbidden to transport any live wildlife into, within or through Wyoming except in compliance with the provisions of this regulation.

(k) The permittee shall maintain current records for the term of the permit on forms approved by the Department. Such records shall be completed accurately and legibly. Original records shall be kept at the holding facility. Data provided on the records shall include dates of purchase, birth, barter, trade, or other form of acquisition; sex, species, subspecies, number of animals captured, received, transported, purchased, reared, date of sale, death, or other form of disposition for each individual animal. Dates and types of disease tests and vaccination records for each animal shall be recorded on the form. Records shall include names and addresses of all suppliers, persons to whom wildlife are sold, traded, bartered, or given, and the date of each transaction.

Section 7. Inspection by Department Personnel. Any person issued a permit under this regulation to import, possess, confine, or transport live wildlife shall allow immediate inspection upon request by Department personnel of records, holding facility(ies), and permitted wildlife during the term of the permit. The Department shall have the right to collect blood or other biological sample(s) for disease testing, genetic identification, or other purposes to protect Wyoming wildlife resources.

Section 8. Notification and Disposition of Diseased or Escaped Wildlife.

(a) Health

(i) The permittee or an authorized agent of the permittee shall notify the Department within twenty-four (24) hours of having reason to believe that wildlife held under a permit pursuant to this regulation may have been exposed to or contracted a contagious disease or parasite. It shall be a violation of this regulation to remove permitted wildlife that there is reason to believe have been exposed to or contracted a contagious disease or parasite from the holding facility(ies) without prior authorization from the Department. The holders of permits for interstate transportation of live wildlife shall immediately notify the Department of the death of any wildlife, or any wildlife exposed to or having contracted a contagious disease or parasite.

(ii) The Department may order inspection by an accredited veterinarian or inspecting agent of permitted wildlife believed to have been exposed to or contracted a contagious disease or parasite. Inspection may be at the expense of the permittee.

(iii) The Department shall determine when destruction, quarantine, or disinfection of diseased wildlife is required at any federal, state, private, or commercial facility. If the Department determines that destruction, quarantine, or disinfection of diseased wildlife, or disinfection of the facility are required, a written order from the Department shall be issued to the permittee or an authorized agent of the permittee setting forth the steps necessary and establishing the time period that the permittee shall carry out such actions.

(b) Escaped Wildlife

(i) The permittee or an authorized agent of the permittee shall notify the Department within twenty-four (24) hours of discovery that permitted wildlife have escaped. If the Department discovers the escape, it shall notify the permittee or his authorized agent within twenty-four (24) hours. If escaped wildlife are not recovered by the permittee or his agent within forty-eight (48) hours following notification to the Department or notification by the Department, the Department may at its discretion take said wildlife. The holders of permits for interstate transportation of live wildlife shall immediately notify an enforcement officer of the Department of any wildlife escapes.

Section 9. Disposition of Live Wildlife. No live wildlife imported, possessed, transported, or confined in the State pursuant to a permit issued under this regulation shall be abandoned, released, removed, or transferred without authorization from the Department. Permitted wildlife released or abandoned without written authorization of the Department may be taken by Department personnel.

Section 10. Game Birds. Live game birds, excluding those held under authority of Wyoming Statute §23-5-102 and Wyoming Game and Fish Commission Regulation, Chapter 40, Regulation Governing Commercial Game Bird Farms, shall only be imported, possessed, confined, transported, or disposed of in accordance with this regulation and the provisions listed in this section. Game birds imported under authority of Wyoming Statute §23-5-102 and Wyoming Game and Fish Commission Regulation, Chapter 40, Regulation Governing Commercial Game Bird Farms or this regulation shall comply with the certificate of veterinary inspection requirements and provisions of Appendix II of this regulation.

(a) Game birds held under a permit, whether live or dead, shall not be sold, traded, bartered or taken except under the provisions of this regulation.

(b) Game birds shall not be taken at locations other than within the holding facilities as described in the permit application, nor shall said game birds be taken by any person other than the permittee, except as provided in subsections (c) and (d) of this section. Game birds may be taken in accordance with Wyoming Game and Fish Regulations, Chapter 13, Partridge Hunting Seasons and Chapter 18, Pheasant Hunting Seasons governing the taking of game birds.

(c) Participants at dog field trial events may take game birds held by permit under the supervision of the permittee subject to the following conditions:

(i) The permittee shall notify the Department in the application for a permit that the permit is for a dog field trial and the dates of the event,

(ii) Department personnel may witness the taking of game birds at these events,

(iii) Live game birds taken at dog field trial events shall remain in possession of the permittee unless the game birds are transferred to a person in possession of a valid permit issued under the terms of this regulation,

(iv) Game birds killed at dog field trial events shall remain in the possession of the permittee unless the person in possession of the dead game birds has a receipt for said game birds issued by the permittee on a form approved by the Department.

(d) Pen-raised game birds may be used for dog training or falconry training throughout the year subject to the following conditions:

(i) The person in possession of the pen-raised game birds shall possess a valid, unexpired permit while engaging in dog training or falconry training,

(ii) Any pen-raised game bird may be taken in dog training or in falconry training,

(iii) Before any pen-raised game bird is released or used in dog training or falconry training, the birds shall be toe clipped or possess a leg band attached by the owner of the game birds,

(iv) The permittee shall notify the Department in the application for a permit that the permit is for the purpose of dog training or falconry training and provide the legal description of the land on which the dog training or falconry training shall take place to the nearest section. The permittee may apply for multiple release sites,

(v) Pen-raised game birds shall not be released in locations inhabited by wild game birds of the same species, unless the season for the taking of the species of game birds released is open according to current Commission Regulations,

(vi) Department personnel may witness the taking of pen-raised game birds,

(vii) Live pen-raised game birds shall remain in possession of the permittee,

(viii) Pen-raised game birds may only be taken by the permittee or by a person or persons in the accompaniment of the permittee and game birds killed shall remain in the possession of the permittee,

(ix) Pen-raised game birds may only be taken with firearms as provided in W. S. §23-3-110 or bow and arrow or crossbow or falconry,

(x) A call back pen or live trap may be utilized for the purpose of retrieving pen-raised game birds released into the wild for dog training or falconry training purposes. Any game bird which is not marked according to subsection (d) (iii) of this section which is taken in the call back pen or trap shall immediately be released to the wild. All call back pens or live traps shall have a visibly attached metal tag bearing the owner's name and address,

(xi) Regardless of the number of permits issued to the person, a person shall be authorized to possess a maximum of one hundred (100) game birds annually during the period January 1 through December 31.

(e) Captive reared mallards shot for dog training shall only be taken with nontoxic shot.

Section 11. Furbearers. Live furbearers shall only be imported, possessed, confined, transported, or disposed of in accordance with this regulation and the provisions listed in this section.

(a) Live furbearers may be captured in the State under terms of Wyoming Statute §23-2-305 for propagation only during open seasons for the trapping of furbearing animals as specified in the Commission Regulation, Chapter 4, Furbearing Animal Hunting or Trapping Seasons.

(b) Persons licensed to capture furbearers for the purpose of propagation shall be governed by the Commission Regulation, Chapter 4, Furbearing Animal Hunting or Trapping Seasons, except that furbearers do not have to be killed before leaving the trap site.

Section 12. Game Farm. The NX Bar Game Farm shall have the right to import, possess, confine, transport, sell or dispose of all the privately owned elk now on the premises and their progeny in accordance with this regulation and the provisions listed in this section. The permittee shall be solely responsible for all costs, expenses, and damages suffered as a result of importation and possession of these animals including, but not limited to, quarantine, or total or partial depopulation on account of contagious diseases or parasites; or costs and expenses associated with the capture of or destruction of escaped animals, excluding the salaries and transportation costs of Department employees. Taking of publicly owned elk by the permittee or his agent or failing to notify the Department within twenty-four (24) hours following discovery of publicly owned elk within the holding facilities shall be a violation of Wyoming Statutes and Wyoming Game and Fish Commission Regulations.

(a) Application for Possession Permit. The Department shall issue a possession permit for all privately owned elk and their progeny confined within the game farm at the time this regulation becomes effective. Application for a permit shall be submitted to the Department on a form provided by the Department. The application shall be legible, fully completed, and include all of the following:

(i) The name, complete mailing address, physical address, and telephone number of the person, as defined by Wyoming Statute §23-1-102(a)(viii), making application for a permit,

(ii) The total number of live, privately owned elk possessed at the time of application,

(iii) The purpose(s) for which the elk are possessed,

(iv) A complete description of the holding facility to include, but not limited to, the geographic legal description to the quarter/quarter section, fencing specifications and design, size and construction specifications for enclosures and handling facilities,

(v) A description of the type of tattoo and any other permanent marking to be utilized on privately owned live elk at the time of import and export,

(vi) The application shall be signed, dated, and sworn to before a notary public,

(vii) All the information required by this subsection shall be kept current by the holder of this permit and any changes in any information shall be promptly provided by the holder of the permit to the Department. The NX Bar Game Farm permit shall be issued to the owner of record of the twenty-three thousand (23,000) acres in northeast Sheridan County on which the game farm is presently operated. The permit is attached to the land, consisting of twenty-three thousand (23,000) acres. Any proposed transferee of the land and permit shall file an application to the Department in the form as prescribed by this subsection.

(b) Import Requirements

(i) All elk (Cervus elaphus) shall be tested prior to importation to determine that they are not hybrids following procedures listed in Appendix II of this regulation. Prior to issuance of a permit, the Department shall be provided with test results. Only pure Rocky Mountain elk (Cervus elaphus nelsoni) shall be permitted for importation. All elk shall satisfy health requirements prescribed in Appendix II of this regulation before a permit to import will be issued.

(ii) The permittee shall obtain the appropriate certificate of veterinary inspection and satisfy the requirements of Appendix II prior to importation.

(iii) Privately owned elk imported into Wyoming for the game farm shall be permanently marked with Department approved ear tags and ear tattoos within fourteen (14) days following importation. Department ear tags shall be placed in individual elk by Wyoming Game and Fish Department personnel or the designated agent of the Department. Blood samples from all elk imported into Wyoming shall be taken by Wyoming Game and Fish Department personnel or the designated agent of the Department within fourteen (14) days following importation in order to establish genetic marking of each elk.

(iv) Application for an importation permit shall be submitted to the Department on a form provided by the Department. The application shall be legible, fully completed, and include all of the following:

(A) The name, complete mailing address, street address, and telephone number of the person making application for a permit,

(B) The total number of live, privately owned Rocky Mountain elk to be imported,

(C) The name and address of the supply source(s), or consignor from which the live elk will be obtained,

(D) Description of the type of tattoo and any other permanent marking to be utilized on all elk,

(E) The application shall be signed, dated, and sworn to before a notary public.

(c) Export Requirements

(i) Privately owned live elk shall be permanently marked with Department approved ear tags and ear tattoos and have blood samples taken prior to removal of the elk from the holding facility. Ear tags shall be placed on each unmarked elk and blood samples taken from each elk by Wyoming Game and Fish Department personnel or the designated agent of the Department.

(ii) Privately owned live elk shall only be removed from the holding facility after notification to a Department representative and upon receipt of written authorization issued after an on-site inspection of the elk by a Department representative. When elk are sold, traded, or otherwise disposed of, the permittee or his authorized agent shall, at the time of transfer of possession or disposal, give a bill of sale on a form

approved by the Department to the person receiving such elk. The bill of sale shall be signed by the permittee or his authorized agent and it shall show the name and address of the recipient, the date of delivery, sex, age, and approved ear tag numbers and ear tattoo. A copy of each bill of sale shall be submitted to the Department by the permittee or his agent no later than the fifteenth (15^{th}) day of each month for transactions from the previous month. For example: the bills of sale for the period of January 1-31 shall be submitted no later than February 15th. Copies of all bills of sale shall be maintained by the permittee on the premises of the holding facility for the current year and the three (3) previous years.

(d) Taking of Privately Owned Elk

(i) Privately owned elk may be taken from January 1 through December 31.

(ii) Privately owned elk that are killed on the game farm shall only be removed from the holding facility when accompanied by a bill of sale. The bill of sale shall include the date taken, client's name and address, description and sex of the elk taken, including its approved ear tag numbers and ear tattoo if available, and the signature of the permittee or his authorized agent. Copies of all bills of sale shall be maintained by the permittee on the holding facility for the current year and the three (3) previous years.

(iii) A Wyoming Interstate Game Tag and affidavit shall be issued for each elk and parts thereof in accordance with Wyoming Statutes and Wyoming Game and Fish Commission Regulation, Chapter 29, Issuance and Sale of Wyoming Interstate Game Tags.

(e) Record Keeping Requirements

(i) The permittee shall maintain current written records on forms prescribed by the Department. Such forms shall be filled out completely, accurately, and legibly. Original records shall be kept at the holding facility. Data provided on the records shall include dates of purchase, birth, barter, trade or other form of acquisition; date of sale, death or other form of disposition for each elk. The approved ear tag numbers and ear tattoo if available for each elk shall be recorded along with that animal's sex and age. Dates and types of disease testing and vaccination records for each elk shall be recorded on the form. All records of each elk shall be retained on the holding facility for the period of ownership of the elk and for three (3) years after the year of disposition of the elk.

(ii) Written records shall be submitted to the Department by the permittee or his agent no later than the fifteenth (15^{th}) day of each month for transactions from the previous month. For example: the records for the period of January 1-31 shall be submitted no later than February 15th. The records shall include the approved ear tag

numbers and ear tattoo, if available, for each elk, that animal's sex and age, dates of purchase, birth, barter, trade, or other form of acquisition; date of sale, death, or other form of disposition for each elk, and dates and types of disease testing and vaccination records for each elk.

(f) Inspection of Records, Holding Facilities, and Wildlife. The game farm shall allow inspection of records, holding facility(ies), and permitted wildlife by Department personnel.

(g) Fence Maintenance. The game farm shall maintain its holding facilities in such a manner as to prohibit escapes of privately owned elk and to prohibit publicly owned elk from entering the facility.

Section 13. Fish. Live fish, fertilized eggs, or gametes legally imported, acquired, possessed, transported, or confined pursuant to this regulation may be taken, transported or sold as provided under Wyoming Statutes relating to private fish hatcheries, private fishing preserves, live bait dealers, and landowner fishing lakes and ponds. (Refer to Commission Regulations, Chapter 46, Fishing Regulations, Chapter 49, Regulation Governing Private Fish Stocking, Chapter 50, Regulation Governing Fishing Preserves, Chapter 51, Regulation Governing Private Fish Hatcheries, Chapter 53, Regulations Governing Landowner Fishing Lakes or Ponds and Chapter 62, Regulation for Aquatic Invasive Species.)

Section 14. Revocation of Permit.

(a) The Department may revoke any permit issued under the authority of this regulation and may dispose of any live wildlife imported, possessed, confined, or transported for failing to comply with these regulations or with conditions placed on the permit at the time of issuance or when the Department has determined that permitted wildlife poses a threat to Wyoming's wildlife as specified in Section 6 (b)(viii) of this regulation. The Department may revoke any permit if the applicant or an authorized agent of the applicant falsified information on the permit application or on the certificate of veterinary inspection, or falsified or failed to keep or submit records as required by this regulation. If the Department revokes a permit, disposition of live wildlife shall be in accordance with Section 17 of this regulation. This section does not apply to the game farm.

(b) A permittee dissatisfied with the Department's decision to revoke a permit may request a hearing before the Wyoming Game and Fish Commission. A request for hearing shall be made in writing to the Chief of the Wildlife Division within ten (10) business days after receipt of the notice from the Department revoking the permit. The hearing shall be conducted in accordance with Commission Regulation Chapter 27, Rules of Practice Governing Contested Cases before the Wyoming Game and Fish Commission.

Section 15. Term of Permit. Permits issued pursuant to this regulation shall include the date of expiration.

Section 16. Permit Renewal. Any person possessing live wildlife held under a permit issued pursuant to this regulation shall make application for a new permit to the Department no later than ninety (90) days prior to the expiration of the existing permit. When an application for renewal is received, the Department may evaluate the existing holding facility to determine if it is adequate to contain the number and type of wildlife for which applied, the purpose(s) for which wildlife shall be held, and to adequately protect Wyoming's wildlife resources. Applications for renewal shall be treated as original applications in accordance with procedures set forth in this regulation. The Department shall renew the permit for the game farm in accordance with Section 12.

Section 17. Disposition of Live Wildlife if Permit Expires. Should a permit expire or be revoked, all formerly permitted live wildlife in possession shall be disposed of by the permittee within seven (7) days or a longer time period agreed to by the Department after expiration or revocation of the permit. No formerly permitted live wildlife shall be abandoned, released, or removed from the holding facility without prior written permission of the Department. All formerly permitted live wildlife remaining at the holding facility seven (7) days after expiration or revocation of the permit may be taken by the Department without compensation to the permittee.

Section 18. Disposition of Live Wildlife Upon Death of Permittee. Upon the death of a permittee, all permitted wildlife shall become property of the permittee's personal representative. The personal representative shall be required to apply for a permit to possess live wildlife within thirty (30) days of the death of the permit holder. All formerly permitted live wildlife remaining at the holding facility forty-five (45) days after death of the permittee may be taken by the Department without compensation unless the permittee's personal representative obtains a permit to possess the wildlife.

Section 19. Wildlife Health Requirements. All persons importing wildlife that require a certificate of veterinary inspection under this regulation shall comply with provisions of Appendix I or II prior to importation. Wildlife shall not be diverted from the destination stated on the permit and on the certificate of veterinary inspection without prior approval of the Wyoming Game and Fish Department. Wildlife entering Wyoming in violation of this regulation or without a proper certificate of veterinary inspection may be held in quarantine at owner's risk and expense and, further, owner or owner's agent shall not allow said wildlife to be moved, turned loose or to escape, but shall be held subject to the order of the Wyoming Game and Fish Department. All persons importing game birds under terms of Wyoming Statute §23-5-102 and Wyoming Game and Fish Commission Regulation, Chapter 40, Regulation Governing Commercial Game Bird Farms; fish under terms of Wyoming Statutes §23-2-208, §23-4-101, §23-4-102, §23-4-103, §23-5-202, §23-5-203, §23-5-204 and Wyoming Game and Fish Commission Regulations, Chapter 46, Fishing Regulations, Chapter 49, Regulation Governing Private

Fish Stocking, Chapter 50, Regulation Governing Fishing Preserves, Chapter 51, Regulation Governing Private Fish Hatcheries and Chapter 53, Regulations Governing Landowner Fishing Lakes or Ponds shall comply with the certificate of veterinary inspection requirements and provisions of Appendix I or II of this regulation.

Section 20. Violation of Commission Regulations. Failure to abide by the provisions of this regulation shall be punishable as provided by Wyoming Statutes for violations of Commission regulations.

Section 21. Illegal Entry from Another Jurisdiction. Any live wildlife illegally taken, possessed, imported, confined, or transported from another jurisdiction shall be considered illegal in the State of Wyoming.

Section 22. Savings Clause. If any provision of these regulations is held to be illegal or unconstitutional, such a ruling shall not affect other provisions of this regulation which can be given effect without the illegal or unconstitutional provision; and, to this end, the provisions of this regulation are severable.

Section 23. Taxonomic References. For the purposes of this regulation, the following taxonomic references have been utilized to establish scientific names and taxonomic grouping (i.e., subfamilies) for wildlife.

(a) Amphibians and Reptiles:

Crother, B. I. (ed.). 2008. Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico, pp. 1-84. SSAR Herpetological Circular 37.

(b) Birds:

Sibley, C.G. and B.L. Monroe, Jr. 1990. Distribution and taxonomy of birds of the world. Yale University Press, New Haven, 1111pp.

Sibley, C.G. and B.L. Monroe, Jr. 1993. A Supplement to distribution and taxonomy of birds of the world. Yale University Press, New Haven, CT 108 pp.

(c) Crustaceans:

McLaughlin, P.A., et al. 2005. Common and scientific names of aquatic invertebrates from the United States and Canada: crustaceans. American Fisheries Society, Special Publication 31, Bethesda, MD. 545 pp.

(d) Fish:

Nelson, J. S., Crossman, E. J., Espinosa-Pěrez, H., Findley, L. T., Gilbert, C. R., R. N., and, Williams, J. D. 2004. Common and scientific names of fishes from the United States, Canada and Mexico: 6th Edition. American Society, Special Publication 29, Bethesda, MD. 386 pp.

(e) Mammal Species, Families and Subfamilies:

Wilson, D.E. and D.M. Reeder (eds) 1993. Mammal species of the world: a taxonomic and geographic reference. 2nd ed. Smithsonian Institution Press, Washington D.C. 1206 pp.

(f) Mollusks:

Turgeon, D. D., et al. 1998. Common and scientific names of aquatic invertebrates from the United States and Canada: mollusks. 2nd Edition. American Fisheries Society, Special Publication 26, Bethesda, MD. 526 pp.

(g) Animal Health:

"Suggested Procedures for the Detection and Identification of Certain Finfish and Shellfish Pathogens" (Bluebook). American Fisheries Society Publication. (http://www.fisheries.org/units/fhs/BlueBook_access.php)

(h) Subspecies of Elk:

Bryant, L.D. and C. Maser. 1982. Classification and distribution. Pages 1-59 in J.W. Thomas and D.E. Toweill (editors). Elk of North America: Ecology and Management. Stackpole Books, Harrisburg, PA. 698pp.

WYOMING GAME AND FISH COMMISSION

By: Edward Mignery
Ed Mignery, President

Dated: November 17, 2010

APPENDIX I
COLD BLOODED WILDLIFE
INSPECTION PROCEDURES

Section 1. General Requirements. A certificate of veterinary inspection is currently required only for all salmonid fishes (trout, salmon, grayling, whitefish), and for northern pike and carp originating from outside North America. Fish health inspections shall be conducted by approved inspecting agents. All inspections shall be conducted in accordance with the accepted guidelines in the latest edition of the "Suggested Procedures for the Detection and Identification of Certain Finfish and Shellfish Pathogens" (Bluebook) published by the Fish Health Section of the American Fisheries Society or supplement to this Appendix. Generally accepted new or alternative procedures may be used for the detection and diagnosis of listed or unlisted pathogens if such procedures are approved by the Technical Procedures Committee of the Fish Health Section/American Fisheries Society.

Permits to import cold blooded wildlife, or letters of authorization relating to private fish stocking, private fish hatcheries, private fishing preserves, live bait dealers, or landowner fishing lakes and ponds may be conditioned on inspection of other species or for other pathogens not listed in this appendix when it is determined by the Department through review of documented cases that importation or transportation of said species or pathogens pose significant health risks to Wyoming's wildlife.

No cold-blooded wildlife showing clinical signs or suspected clinical signs (lethargic behavior, abnormal mortality, lesions, etc.) of disease shall be imported. Suspected disease in any captive cold blooded wildlife shall be reported to the Department immediately.

Section 2. Required Inspections. All appropriate inspections shall be completed by an inspecting agent and reported on a form approved by the Department before anyone shall import, transport or possess live fish, fertilized eggs or live fish gametes in Wyoming. An approved laboratory technician is authorized only for compliance collection of non-lethal samples (ovarian or seminal fluids) for a brood stock fish health inspection after the initial lethal and non-lethal sampling has been conducted by either an aquatic animal health inspector or fish pathologist. On the basis of these inspections the Department may authorize fish importation, possession, transportation and stocking.

A copy of a current fish health inspection report form shall accompany each shipment of live salmonid fish, fertilized eggs or gametes scheduled for importation into Wyoming, and shall also be on file with the Department a minimum of seven (7) working days prior to importation. This form shall include appropriate inspection data for all lots of fish present at the shipping aquaculture facility. If any lot(s) of fish present at the shipping

aquaculture facility originated from a brood stock not located at the shipping aquaculture facility, a current inspection report for that brood stock source shall also accompany each shipment and shall also be submitted to the Department as stated above. Under special circumstances, the Department may make exceptions on a case-by-case basis. Any exception shall be based upon a formal written proposal submitted to the Department by the entity requesting the exception. Exceptions shall be granted only if the probability of introducing a prohibited or notifiable pathogen is virtually impossible under the proposed conditions and handling. Any exceptions shall be written matters of record, including rationale.

(a) Species of Concern.

(i) A certificate of veterinary inspection (fish health inspection report) shall be required for all salmonid fishes, fertilized eggs and gametes; and for northern pike and carp originating from outside North America.

(ii) Other species not belonging to the family Salmonidae, that are present at a facility which rears salmonid fishes, may be subject to sampling if deemed necessary by the Department. A current disease free salmonid fish health inspection shall accompany any non-salmonid fish transported from a facility rearing salmonid species.

(b) Pathogens of Concern. The fish health inspection report shall include a report on the occurrence of the following pathogens:

(i) Prohibited Pathogens

Ceratomyxosis of Salmonids - Ceratomyxa shasta
Infectious Hematopoietic Necrosis - IHN virus
Infectious Pancreatic Necrosis of Salmonids -IPN virus
Proliferative Kidney Disease (PKD)
Rhabdovirus Disease of Northern Pike Fry - PFR
Spring Viremia of Carp - Rhabdovirus carpio
Viral Hemorrhagic Septicemia of Salmonids - VHS virus
Herpesvirus salmonis Type 2

(ii) Notifiable Pathogens

Bacterial Kidney Disease - Renibacterium salmoninarum
Enteric Redmouth - Yersinia ruckeri
Furunculosis - Aeromonas salmonicida
Whirling Disease of Salmonids - Myxobolus cerebralis

(iii) Reportable Pathogens

Any diseases/pathogens not listed but which are known to be present or are detected during inspections shall be reported to the Wyoming Game and Fish Department.

The above classification and list of pathogens may be amended by Commission action as more knowledge becomes available.

Inspecting agents are encouraged to perform routine fish health surveillance (monitoring) in the absence of required inspections. In addition, general health history of aquaculture facilities shall be made available, on request, to all fish and fish egg transfer recipients.

(c) Frequency of Inspections

(i) Annual fish health inspections performed by an inspecting agent shall be mandatory for any in-state facility that cultures, holds, sells, or stocks live fish, fertilized eggs or gametes.

(ii) The Department shall establish schedules for disease inspection of all state facilities and wild brood stock populations, and all in-state private facilities; see that inspections are conducted; and see that results are reported to all appropriate individuals.

(iii) State of Wyoming inspecting agents shall be responsible for inspecting state fish culture facilities; wild, free-ranging brood stocks, and in-state private hatcheries and aquaculture units.

(iv) A formal request by the owner shall be required before an inspecting agent conducts an inspection of any in-state private hatchery or aquaculture unit. A completed departmental application shall be submitted to the Department to request this inspection. The applicant for inspection is legally accountable for completeness and accuracy of information supplied in the application and to the inspecting agents.

(v) Fish health inspections within the past twelve (12) months shall be required prior to importation of species listed in this appendix. Inspection reports shall be received by the Department prior to authorizing or permitting importation or sale.

(vi) The Department may require additional fish health inspections in response to fish health concerns.

(vii) Any person importing, possessing or transporting live fish, fertilized eggs or live fish gametes in Wyoming shall allow immediate inspection upon request of Department personnel. The Department shall have the right to inspect and

collect samples (including lethal samples) for disease testing, species identification or other purposes to protect Wyoming's fisheries resource.

(d) Sample Procedures

(i) Determining Sample Size

The minimum sample size for each lot of fish shall be in accordance with a plan which provides at least 95% confidence of detecting a pathogen (see table below). Attribute sampling shall be based upon the assumption of a pathogen's prevalence in facilities (hatcheries) or free-ranging (wild) populations as follows:

	Assumed Prevalence of Pathogens	
	2%	5%
Population of Lot Size	Size of Sample Required	
50	50	35
100	75	45
250	110	50
500	130	55
1,000	140	55
2,000	145	60
10,000	145	60
100,000 or greater	150	60

(ii) Production Fish

Viral-sample all lots, including brood stock lots, at the 5% (or lower) level of assumed prevalence of listed pathogens. This pertains to lethal sampling of both hatchery and wild populations.

When sampling for detection of bacterial kidney disease, enteric redmouth and furunculosis, the minimum sampling shall be sixty (60) fish from each water supply at each facility.

When sampling for detection of Salmonid Whirling Disease, the minimum sample shall be 60 fish (heads, including gill arches) of each representative lot at an accumulative minimum of 1,800 CTU (CTU=sum of the average daily water temperature in degrees Celsius) exposure at the time of inspection for each water source, and 900 CTU for an individual lot certification. Any fish lot sampled must be on the same water source for a minimum of 900 CTU. Also, the representative water source sample shall be biased toward fish species most susceptible to whirling disease (susceptibility in approximate decreasing order: rainbow, golden, brown, brook, cutthroat, and kokanee salmon). Additional samples, independent of water source

assessments, may be required of individual lots if rearing conditions (e.g. dirt ponds) are conducive to enabling the parasite life cycle.

(iii) Brood stocks

Sample all brood stock lots at the 5% (or lower) level of assumed prevalence of listed pathogens annually (if adequate numbers of brood stock fish are available). This pertains to non-lethal sampling (collection of ovarian and seminal fluids). Ovarian fluid samples must account for the majority (60 samples or greater) of the collective reproductive product.

(A) Unless defined below as brood stock development for genetic sources, Section II(d)(iv), establishment of a disease free brood stock will require three consecutive annual fish health inspections prior to the clearance and use of these gametes for the development of a confined fish population. Fish health inspections will include sampling all age classes of the brood stock population held at the facility. A complete disease free fish health inspection of the brood stock population must be completed on the third year prior to use of gametes.

(iv) Genetic Sources

Development of brood stocks or infusion of new genes into existing brood stocks may result in situations which do not lend themselves to standard fish health inspection procedures as described elsewhere in this regulation. In order to facilitate development and maintenance of genetic sources, the following procedures shall be used to meet brood stock needs and ensure that brood stocks and receiving facilities remain free of serious fish pathogens:

(A) When sufficient numbers of fish are available, and there are no biological or sociological problems associated with sacrificing the prescribed numbers of fish, then the standard sampling procedures described in this regulation shall be followed.

(B) When dealing with small domestic brood stocks or exceptionally long-lived brood stocks (e.g. lake trout) with a current disease free inspection and no infusion of new fish or fish eggs, progeny from the brood stock shall be used for lethal samples at the prescribed number to meet inspection requirements provided the progeny are held in the same water supply in (or downstream from) the same rearing space for a minimum of four (4) months prior to inspection.

(C) When population numbers of wild fish are limited or it is not feasible to capture adequate numbers of fish to meet prescribed inspection sample size, then one of the following procedures shall be used under Department authorization:

(aa) When wild fish are too rare to sacrifice the following shall occur: 1) From the fish available, collect and hold ovarian and seminal fluids, and if available fecal material in separate containers; 2) Disinfect fertilized eggs in 100 mg/l active iodine for 10-15 minutes at collection site or at an isolation facility; 3) Incubate and hatch eggs under quarantine (isolation facility) conditions; 4) Raise fish at an isolation facility to a size of 2 inches in length; 5) Conduct lethal sampling on these fish at the 2% assumed prevalence level (150 fish) for a complete fish health inspection; 6) If these samples are found to be disease free, this lot of fish can then be considered disease-free for brood stock recruitment; 7) If serious fish pathogens are found in the parent fish, the eggs or fish shall be destroyed and the isolation facilities disinfected.

(bb) When wild parent fish can be sacrificed or when dealing with cryopreservation or extension of sperm for use in infusing new genes into existing brood stocks, the following shall occur: 1) Collect samples, disinfect eggs, and incubate eggs as above, (a)(1-3); 2) Conduct 100% lethal sampling on parent fish (for kidney, spleen, etc.); 3) If parent fish are found to be disease-free, the eggs and resulting fish can be considered disease-free; 4) If serious fish pathogens are found in the parent fish, the eggs or fish shall be destroyed and the isolation facilities disinfected.

Section 3. Prohibited Pathogens: Courses of Action.

(a) Fish, fertilized egg, or gamete sources outside Wyoming with occurrence of prohibited pathogens shall not be permitted to import or stock fish, fertilized eggs, or gametes into the State of Wyoming until appropriate disinfection or depopulation procedures have been conducted and until any and all remaining fish lots have been subsequently inspected twice within a six (6) month period at least one (1) month apart by an inspecting agent and found to be free of prohibited pathogens.

(b) Upon confirmation of the finding of a prohibited pathogen in any facility within Wyoming, steps shall be taken by the Department and other appropriate officials, as necessary, to immediately have all lots of fish and eggs at the facility incinerated or buried (deep burial utilizing lime). Complete chemical disinfection of said facility shall then be immediately planned and executed to minimize the risk of establishment or spread of the pathogen. Two consecutive inspections shall be conducted by an inspecting agent within a six (6) month period to determine that there is no occurrence of the prohibited pathogen prior to stocking any fish, fertilized eggs, or gametes.

(c) If at any time an inspecting agent finds, suspects or becomes aware of the presence of one or more pathogens listed as prohibited at any site within Wyoming, the agent shall immediately contact the Chief of Fisheries. The inspecting agent shall, within five (5) days, initiate action to confirm presence or absence of the pathogen. If positive identification is made, the agent shall immediately notify the Chief of Fisheries who shall initiate Reasonable Action as defined in this regulation. All incidents of fish disease shall be treated in accordance with actions specified in this regulation.

Section 4. Notifiable Pathogens: Courses of Action.

(a) Upon confirmation of the finding of a notifiable pathogen in any facility which raises, imports or transports fish or fish gametes in or into Wyoming, the inspecting agent and owner of the facility shall immediately notify the Department.

(b) Infected lots, if not destroyed, shall be quarantined and treated with the best available technology to eradicate the pathogen. Each lot within the entire facility shall be inspected twice within a six (6) month period at least one (1) month apart to determine that no notifiable pathogens remain prior to authorization to resume normal operations. Stocking of infected fish into the waters of Wyoming shall be prohibited.

(c) During this interval, no fish shall be transferred to another facility. Non-infected lots may be stocked, with written permission by the Department, only into waters that would pose no threat to naturally reproducing fish populations (i.e. isolated "stock ponds" with no outlet or effluent). The course of action to solve the fish health problems shall be prescribed in writing by the Department.

(d) If at any time an inspecting agent finds, suspects or becomes aware of the presence of a notifiable pathogen at any site within Wyoming, the agent shall immediately contact the Chief of Fisheries. The inspecting agent shall, within five (5) days, initiate action to confirm presence or absence of the pathogen. If positive identification is made, the agent shall immediately notify the Chief of Fisheries who shall initiate Reasonable Action as defined in this regulation. All incidents of fish disease shall be treated in accordance with actions specified in this regulation.

(e) Contingent on approval by the Chief of Fisheries, fertilized or eyed eggs may be shipped from facilities or brood stock sources infected with Enteric Redmouth (Yersinia ruckeri) or Furunculosis (Aeromonas salmonicida) if eggs are disinfected prior to shipment and again upon receipt with 100 mg/l active iodine for 10-15 minutes.

Section 5. Reportable Pathogens: Courses of Action. Reportable pathogens include all other organisms known to cause disease in fish but inspection is not required. However, any pathogen found incidental to inspection shall be reported.

APPENDIX I

SUPPLEMENT - Number 1

TITLE: Inspection procedure required for detection of organisms inducing Proliferative Kidney Disease (PKD)

INTRODUCTION: Proliferative Kidney Disease (PKD) is included as a prohibited disease.

Clinical signs include:

1) dark body color;
2) abdominal distention;
3) pale gills;
4) pronounced lateral body swelling;
5) bilateral exophthalmia;
6) swollen kidneys;
7) enlarged spleen;
8) grayish discoloration of kidneys; and
9) folded or corrugated appearing kidneys.

Fishes being transported into Wyoming from PKD/PKX occurring sources or areas in California, Oregon, Washington, Idaho, Montana, British Columbia (or any other areas where occurrence becomes documented) shall be inspected and found free of PKD and the PKX pathogen by appropriate source inspection.

Inspecting agents performing inspections or routine diagnostic evaluations of fishes within Wyoming or inspections on fishes outside Wyoming and outside of the area listed in the above paragraph shall perform PKD/PKX testing on any fish which exhibit clinical signs of PKD.

APPENDIX I

SUPPLEMENT - Number 2

TITLE: Inspection requirements regarding Ceratomyxa shasta

INTRODUCTION: Ceratomyxosis of Salmonids, caused by Ceratomyxa shasta considered a prohibited disease. However, since this disease has occurred only within a relatively well-defined geographic area, inspection for the causative agent is not required for fishes residing within Wyoming or for transport into Wyoming from areas outside the geographic areas listed below. Inspection shall be required for C. shasta for transports into Wyoming from any source within the areas listed below.

EPIZOOTIC FOCUS ZONE, Ceratomyxa shasta:

1. All portions of the states of Washington, Oregon, and Idaho.

2. That portion of the State of California north of a line drawn due east from the southern tip of the San Francisco Bay.

3. That portion of the Canadian Province of British Columbia south of a line drawn due east from the northernmost tip of Vancouver Island.

APPENDIX I

SUPPLEMENT - Number 3

TITLE: Special inspection requirements regarding Rhabdovirus Disease of Northern Pike Fry (PFR)

INTRODUCTION: Rhabdovirus Disease of Northern Pike Fry caused by the agent known as Pike Fry Rhabdovirus (PFR) is in the Prohibited Disease/Pathogen category.

Inspection procedures for this disease and the agent causing it are included in the Inspection Regimen listed below. However, since this disease is currently known to occur only in Europe, inspection for this disease/pathogen shall only be required for importations of Esocids and Percids from Europe. Inspecting Agents shall evaluate inspections completed by European fish health specialists.

Clinical signs include:

1) loss of equilibrium;
2) pale gills;
3) exophthalmia;
4) hydrocephalus;
5) redness and swelling above pelvic fins; and
6) petechiae of spinal cord, spleen, pancreas, and hematopoietic tissues of kidneys.

INSPECTION REGIMEN:

1. Assume no greater than 5% carrier prevalence and sample for 95% confidence in each lot.

2. Sample processing:
   a) Use standard inoculum preparation procedures employing whole fry, viscera, or kidney/spleen samples.
   b) Employ RTG-2, FHM, or other cell lines demonstrated to be sensitive to PFR.
   c) Incubate primary inoculation assays for fourteen (14) days in the temperature range of 15C to 24C.

3. Virus identification:
   a) Positively identify PFR with serological procedures, if available.
   b) Presumptively identify PFR by characterization of CPE and inability of other antiseras to neutralize infectivity (if specific PFR antiserum is not available).

APPENDIX I

SUPPLEMENT - Number 4

TITLE: Special inspection requirements regarding Spring Viremia of Carp (SVC, Rhabdovirus carpio)

INTRODUCTION: Spring Viremia of Carp, caused by the agent Rhabdovirus carpio, is in the Prohibited Disease/Pathogen category.

Inspection procedures for this disease and the agent causing it are included in the Inspection Regimen listed below. However, since this disease is currently not known to occur in North America, inspection for this disease/pathogen is only required for importation of non-salmonid fishes from outside of North America. Inspecting agents shall evaluate inspections completed by source located fish health specialists.

Clinical signs include:

1) dark body color;
2) loss of equilibrium;
3) exophthalmia;
4) abdominal distention;
5) inflamed and edematous vent;
6) peritonitis;
7) ascites;
8) catarrhal enteritis; and
9) petechiae in heart, liver, kidneys, intestines, internal wall of swimbladder and skeletal muscle.

INSPECTION REGIMEN:

1. Assume no greater than 5% carrier prevalence and sample for 95% confidence.

2. Sample processing:
    a) Use standard inoculum preparation procedures employing whole fry, viscera, or kidney/spleen/liver samples.
    b) Employ FHM, EPC, RTG-2, BB, GHK-21, chick embryo fibroblasts or other cell lines demonstrated to be sensitive to Rhabdovirus carpio.
    c) Incubate primary inoculation assays for seven (7) days in 20°-22°C temperature range.

3. Virus identification:
    a) Positively identify serologically, if possible.
    b) Presumptively identify by characterization of CPE and inability of other antiseras to neutralize infectivity (if specific antiserum is not available).

APPENDIX I

SUPPLEMENT - Number 5

TITLE: Herpesvirus salmonis Type 2

INTRODUCTION: Herpesvirus disease of salmonids, Herpesvirus salmonis Type 2, previously the oncogenic viruses Oncorhynchus masou virus (OMV) and H-83, yamame tumor virus (YTV), coho salmon tumor viruses (CSTV, OKV, COTV, CSLV) and the nononcogenic Nerka virus from Towda Lake, Akita and Amori Prefecture (neVTA). Herpesvirus salmonis Type 2 causes mortality in salmon fry and induces tumors in survivors. Experimental infections have been demonstrated in rainbow trout and chum salmon, kokanee, and coho salmon.

KNOWN GEOGRAPHIC RANGE: Japan.

INSPECTION REQUIREMENT: Inspection for Herpesvirus salmonis Type 2 shall be required only if the fish/gametes originate from Japan.

Clinical signs include:

1) First isolated in ovarian fluids of masou salmon with no abnormal external signs;
2) Pathogenic to fry;
3) Fish older than two-hundred forty (240) days appear to be resistant;
4) Affected fish are lethargic or show erratic swimming behavior, anorexic, display exophthalmia and petechiation of the body surface, particularly under the jaw; and
5) Tumors may occur in the mouth, head and fin regions of surviving fish beginning one-hundred thirty (130) days post-infection.

DIAGNOSIS:

1. Typical CPE in susceptible cell cultures (RTG2 and CHSE-214) at 15°C: massive syncytium and formation of multinucleate giant cells.

2. Histopathology: kidney of one (1) month old salmon show typical syncytium formation with accompanying necrosis of hematopoietic tissue; epidermal cells of the mouth, jaw, operculum or skeletal tissues may show necrosis and numerous granules; atrophy and necrosis of the liver may occur; necrosis of the pancreas and spleen may be observed in moribund specimens.

3. Confirmatory diagnosis: neutralization with specific anti-OMV, YTV, or CSTV serum.

DETECTING SUBCLINICAL INFECTIONS:

1. The presence of tumors with serum anti-OMV titers is indicative of prior exposure to OMV.

TRANSPORTATION AND STORAGE OF SAMPLES:

1. Samples shall be frozen for not more than seven (7) days.

2. Ideally, samples shall be transported on ice and processed within twenty-four (24) hours.

APPENDIX II
WARM BLOODED WILDLIFE
INSPECTION PROCEDURES

Section 1. General Requirements. Live wildlife of any species, game bird, or hatching eggs, that is affected with or that has recently been exposed to any infectious, contagious or communicable disease or the following parasites: meningeal worm (Paraelaphostrongylus tenuis), tissue worm (Elaphostrongylus cervi), or large American liver fluke (Fascioloides magna); or that originates from a quarantined area, shall not be imported or in any manner transported into or through the State of Wyoming. All shipments shall comply with Federal regulations.

Section 2. Certificate of Veterinary Inspection. A certificate of veterinary inspection shall be required for all wildlife imported under provisions of this regulation, unless otherwise exempt by this regulation.

A copy of the certificate of veterinary inspection shall be forwarded immediately to the animal health official of the state of origin for approval and transmittal to the Wyoming State Veterinarian and Wyoming Game and Fish Department. The copy that accompanies the shipment need not be approved by officials of the state of origin prior to movement.

A certificate of veterinary inspection shall be valid for ten (10) days following date of inspection and issuance. All certificates of veterinary inspection shall be issued to comply in all respects with requirements of the State of Wyoming, unless otherwise specifically authorized in writing by the Wyoming Game and Fish Department.

Accredited, licensed veterinarians who are approved by the animal health official of the state of origin, and veterinarians in the employ of the Animal and Plant Health Inspection Service, United States Department of Agriculture, may inspect.

If a permit is required, the permit number shall appear on the certificate of veterinary inspection.

Section 3. Disease/Parasite Testing Requirements.

(a) Brucellosis

For the purpose of animal identification and recording of brucellosis test results, the official United States Department of Agriculture metal ear tag shall be the only acceptable form of identification. Except, animals bearing official ear tags of other countries need not be retagged.

(i) Brucella abortus

Serum testing shall be conducted on all ruminants. Tests shall be done within thirty (30) days prior to import and the serum samples shall be tested at a United States Department of Agriculture (USDA) approved laboratory. A battery of at least four (4) types of tests shall be required which shall include the standard plate test and the complement fixation test. Any positive or suspect reaction in a serum test shall be interpreted as indicative of infection and the shipment shall be denied importation until resolved by the Wyoming Game and Fish Department and the Wyoming State Veterinarian. Test data shall be recorded on the certificate of veterinary inspection accompanying the wildlife. Retesting shall be conducted at forty-five to one-hundred twenty (45-120) days if post-entry quarantine is required.

(ii) Brucella suis

(A) Rangiferian brucellosis

All caribou and reindeer shall be tested for Brucella spp. Biovar 4 through a testing protocol equivalent to testing for B. abortus as outlined in Section 3(a)(i).

(B) Swine brucellosis

All wild swine and peccaries shall be tested serologically for B. suis by swine brucellosis tests at a USDA-approved laboratory. Wild swine are defined as an individual animal or as a group of swine, any of which have lived any part of their lives free roaming.

A wild swine population may be classified as a monitored swine population when it (a) can be defined geographically, (b) has no contact with any other swine population or any known infected domestic swine herd, and (c) is under surveillance and tested negative for brucellosis.

A battery of six (6) different types of tests (plate, tube, card, buffered plate, complement fixation, and rivanol) shall be required, and testing shall be done within thirty (30) days prior to importation. No shipment of wild swine with any test positive individual(s) shall be allowed to be imported without prior approval of the Wyoming Game and Fish Department and Wyoming State Veterinarian. Test data shall be provided as part of the official certificate of veterinary inspection accompanying the animal(s). Upon entry, wild swine shall be held under quarantine and retested thirty (30) days to one-hundred twenty (120) days post-entry.

(C) Brucella ovis

All wild sheep and goats shall be serologically tested and found negative to any Brucella species by an ELISA test within thirty (30) days prior

to entry. Test results shall be part of the official certificate of veterinary inspection accompanying the wildlife.

(b) Tuberculosis

(i) Cervidae

All Cervidae imported into the state shall be from herds not known to be infected with or exposed to tuberculosis and shall comply with the following testing requirements:

(A) The Commission incorporates into this rule the United States Department of Agriculture Animal and Plant Health Inspection Service Uniform Methods and Rules Bovine Tuberculosis Eradication Methods and Rules Effective January 22, 1999, Part IV—Captive Cervids: Standard Procedures (Minimum Requirements) which is Supplement 1 to Appendix II of this rule. The U.S.D.A. rules can be viewed on the website http://www.aphis.usda.gov/oa/pubs/bovtbumr/bovtb4.html. The U.S.D.A. rules do not include any later amendments or editions of the incorporated matter.

(B) Animals moved interstate into Wyoming that originate from herds other than accredited herds shall be retested using an official tuberculosis test at 90-120 days if post-entry quarantine is required.

(C) In all cases of Cervidae investigated for tuberculosis, the herd quarantines and follow-up procedures shall be as prescribed by the Wyoming Game and Fish Department and the Wyoming State Veterinarian and the U. S. Department of Agriculture, Animal and Plant Health Inspection Service Uniform Methods and Rules for Tuberculosis Eradication in Cervidae.

(ii) Other Mammals

All other wild mammals imported into the state shall be from sources not known to be affected with or exposed to tuberculosis and shall comply with the following testing requirements:

(A) Animals shall test negative to a single strength cervical, caudal fold, or palpebral tuberculin test (which ever technique is recognized as most appropriate) within thirty (30) days prior to importation.

(B) Post-entry quarantine and re-testing may be required by the Department.

(iii) Birds

All wild birds imported into the state which require a certificate of veterinary inspection under this regulation shall have a statement included on the certificate that no bird within the flock of origin is known to be infected with or to be exposed to avian tuberculosis.

(c) Chronic Wasting Disease

Any captive cervid imported into Wyoming must originate from facilities certified to be free of chronic wasting disease (CWD) for five (5) years previous to the requested date of importation. For a facility to be certified CWD-free, all cervids over the age of six (6) months that have died at the point of origin, or that have died at facilities within five (5) years of transferring cervids to the point of origin, shall have been necropsied by a veterinary pathologist. Brain stem, particularly in the region of the obex, shall have been analyzed, either by immunohistochemistry, or Western blot, or ELISA for the presence of protease-resistant prion protein (PrPres). Alternatively, retropharyngeal lymph nodes or tonsils can be analyzed by either immunohistochemistry or by federally-approved enzyme-linked immunosorbent assay. A positive reaction on any test is considered diagnostic for the presence of CWD.

(d) Johne's Disease/Paratuberculosis

All wild ruminants imported into the state shall be from herds not known to be affected with or exposed to Johne's disease/paratuberculosis and shall comply with the following requirements:

(i) The certificate of veterinary inspection shall include a statement that no animal on the premise of origin is known to be infected with or to be exposed to Mycobacterium paratuberculosis.

(ii) The animals shall test negative on an ELISA test conducted at an approved laboratory within thirty (30) days prior to import.

(e) Elaphostrongylinae parasites: meningeal worm (Parelaphostrongylus tenuis) and tissue worm (Elaphostrongylus cervi)

All Cervidae and Bovidae, except members of the subfamily Bovinae, imported into the state shall be from herds not known to be infected with or exposed to meningeal worm (Parelaphostrongylus tenuis) or tissue worm (Elaphostrongylus cervi) and shall comply with the following quarantine and testing requirements:

(i) Cervidae and required Bovidae shall be examined for Elaphostrongylinae infection in the absence of anthelmintic (including ivermectin - Ivomec (registered trademark)) treatments that could mask detection of the parasites.

(ii) Prior to entry all Cervidae and required Bovidae shall be held in pre-entry quarantine for sixty (60) days and two fecal tests for dorsal-spined larvae shall be made by an approved laboratory using the Baermann technique within the quarantine period. The first test shall be conducted at least thirty (30) days and not more than forty (40) days before the second test. During this period, test animals shall be held in quarantine and isolated from all other animals not included in the shipment. Animals tested for import into Wyoming shall be certified by an accredited veterinarian that the animals have not been treated with or exposed to anthelmintics, including ivermectin, during the time period beginning at least thirty (30) days before the first fecal test. The certificate of veterinary inspection accompanying cervids and required bovids imported into Wyoming shall include a statement that "The animals included in this inspection have not been exposed to anthelmintics, including ivermectin, within the past ninety (90) days". Fecal samples of at least 30 grams per sample shall be collected by an accredited veterinarian from the rectum and identified to the animal by the official animal identification number. If any animal tests positive for dorsal spined larvae to either of the two fecal tests, the entire consignment shall not be allowed to be imported.

(iii) Post-entry, animals shall be held for one-hundred eighty (180) days in on-site post-entry quarantine during which time they shall be certified by an accredited veterinarian to have not been treated with or exposed to anthelmintics, including ivermectin (Ivomec). The animals shall be available for inspection by personnel of the Wyoming Game and Fish Department and the Wyoming State Veterinarian during this time. Thirty, 60, 90, 120, 150, and 180 days after importation, fecal samples shall be tested by the Baermann technique in an approved laboratory and found negative for the presence of dorsal-spined larvae. Fecal samples shall be collected from the rectum and identified to each animal by its official identification number by a veterinarian accredited in Wyoming. If any animal tests positive for dorsal spined larvae to any of the fecal tests, the entire consignment shall be destroyed or removed from the State of Wyoming within ten (10) days.

Precautions shall be taken to prevent accidental infection of gastropods with Elaphostrongylinae larvae while animals are held in post-entry quarantine. Precautions should follow, but not be limited to the following procedures:

(A) During the period April 1 through October 31, the post-entry quarantine site shall be prepared prior to entrance of the imported animals to prevent the presence of the gastropod intermediate hosts of Elaphostrongylinae larvae by:

Keeping the animals on a hard surface, such as asphalt or concrete; or

Spraying a four-meter wide tract around the perimeter of the holding compound with a molluscicide and also spraying the molluscicide within the quarantine area. The perimeter track shall be treated once every five (5) days and within twenty-four (24) hours of precipitation (10 mm or more) to ensure the gastropod population shall be kept at zero within the compound.

(B) During the period November 1-March 31, the quarantine site need not be subjected to the site preparation actions if local weather with consistently freezing temperatures is suitable to preclude gastropod activity. However, if the quarantine site is not a hard surface, it shall be harrowed during April to facilitate fecal breakage and exposure of larvae to sunlight. The quarantine facility shall be left vacant from April 1-June 30. A molluscicide shall be sprayed on the quarantine area and on a four-meter wide perimeter tract in the second week of April, the second week of May, and the second week of June. All solid animal waste from the quarantine area shall be disposed of by burning.

(f) Large American Liver Fluke (Fascioloides magna)

All Cervidae to be imported into the state shall be from sources not known to be infected with or exposed to Fascioloides magna and shall comply with the following test requirements:

(i) Two negative fecal tests using sedimentation techniques shall be conducted prior to importation by an approved laboratory. The two tests shall be conducted thirty (30) to forty-five (45) days apart, and the second test shall be conducted within thirty (30) days of importation. Fecal samples shall be collected from the rectum by an accredited veterinarian and identified to the animal by an official identification number.

(ii) Any animal with a positive fecal test shall not be imported.

(g) Ticks, Mites, Lice

All wild birds and mammals to be imported into the State which require a certificate of veterinary inspection shall be examined for ectoparasites by an accredited veterinarian prior to entry.

(h) Besnoitiosis

All caribou and reindeer imported shall be visually inspected for skin lesions characteristic of Besnoitia sp. infection by an accredited veterinarian prior to importation. Animals from a source with clinically infected animals or a previous history of infection shall not be allowed into Wyoming.

(i) Swine Pseudorabies

All wild swine and peccaries shall be tested serologically for pseudorabies within thirty (30) days prior to entry and shall be held in on-site post-entry quarantine and isolation for retest no sooner than thirty (30) days and no longer than sixty (60) days from date of entry.

No pseudorabies vaccinated wild swine shall be imported into Wyoming without prior written consent of the Wyoming Game and Fish Department and State Veterinarian.

(j) Chlamydiosis

A certificate of veterinary inspection completed by an accredited veterinarian within ten (10) days of importation into the state shall be required for all Psittacine birds. Psittacine birds infected with or exposed to chlamydiosis (parrot fever, psittacosis, or ornithosis) shall not be imported into Wyoming.

(k) Disease Testing Requirements Specific to Game Birds

A certificate of veterinary inspection completed by an accredited veterinarian from the state of origin within ten (10) days prior to importation of game birds or game bird eggs into the State shall be required. In addition, a statement signed by the supplier of the game birds shall be submitted to the Wyoming Game and Fish Department, Attention: Permitting Officer, 3030 Energy Lane, Casper, Wyoming 82604 on a form prescribed by the Department attesting that the game birds or game bird eggs and premises of origin are free of infectious, contagious and communicable diseases. Diseases include, but shall not be limited to, Newcastle disease, Salmonella, pullorum, avian cholera, duck viral enteritis, Mycoplasma gallisepticum, and avian influenza. The statement shall also indicate that no game bird within the flock of origin is known to be infected with or to be exposed to avian tuberculosis. Game birds and premises of origin shall have been free of said diseases for at least one (1) year immediately preceding the date of shipment into the State and the premises shall not have experienced an undiagnosed mortality of more than ten percent (10%) of the game birds during the same one (1) year period. Minimum requirements specified in Chapter VIII, Import Proclamation Pertaining to Livestock, Poultry, Other Animals and Certain Biologics, obtainable from the Wyoming Livestock Board (307-777-7515) shall be met.

Falsification or inaccurate statements by the owner or manager of the supply source of game birds or game bird eggs shall result in denial of future import permits for game birds to be acquired from that supply source.

The Wyoming Game and Fish Commission strongly advises game bird permittees to acquire game birds and eggs from producers who participate in the National Poultry Improvement Program.

All wild birds of the subfamilies Tetraoninae (grouse) and Meleagrididae (wild turkey) shall test negative within thirty (30) days prior to importation for Mycoplasma gallisepticum, M. synoviae, M. meleagridis, and Salmonella pullorum (Pullorum Disease) and S. gallinarum (Fowl Typhoid). Additionally, if the state of origin has documented cases of Newcastle Disease or Avian Influenza in the past two (2) years, wild birds should be tested for these diseases. For groups of grouse to be imported from the same source, in a single shipment, testing shall be required for at least twenty-five percent (25%) (one of every four) of those birds provided that at least twelve (12) grouse are tested (i.e. testing shall be required on twelve (12) grouse or twenty-five percent (25%) of the shipment, whichever number is larger.

(l) Disease/Parasite Testing Requirements Specific to Furbearing Animals

A certificate of veterinary inspection completed by an accredited veterinarian within ten (10) days of importation into the state shall be required for all furbearing animals. In addition, a signed statement on a form, prescribed by the Department, shall be submitted to the Department attesting the furbearing animals and the premise of origin are free of infectious, contagious, or communicable diseases. The statement shall state that the furbearing animals have not been exposed to rabies, nor have they originated from an area under quarantine for rabies. They shall also be free of ectoparasites, including mange mites.

Section 4. Hybridization Testing Requirements. Wyoming Game and Fish Commission Regulations only allow importation into the state pure Rocky Mountain elk (Cervus elaphus nelsoni) in order to prevent hybridization of native wild elk with other members of the genus Cervus.

Elk imported into the state shall comply with the following requirements:

All elk shall be tested prior to importation for evidence of hybridization. Any animal testing positive for hybridization with any other species of Cervid (e.g. Manitoba elk, Roosevelt elk, Tule elk, Sika deer, etc.), or that is known to be a hybrid, shall not be allowed to be imported into Wyoming.

Blood samples for tests for hybridization shall be collected by an accredited veterinarian and identified to the animal by the official animal identification number.

Laboratory tests for hybridization shall only be accepted from laboratories approved by the Wyoming Game and Fish Department. Copies of test results shall be forwarded to the Wyoming Game and Fish Department before approval for importation will be granted.

Supplement 1

United States Department of Agriculture
Animal and Plant Health Inspection Service

Bovine Tuberculosis Eradication Uniform Methods and Rules, Effective January 22, 1999

Part IV—Captive Cervids: Standard Procedures (Minimum Requirements)

A. Classification of captive cervids tested

1. Single cervical tuberculin test

a. Herds of unknown status—All responses shall be recorded and the animals shall be classified as suspects and quarantined for retest with the CCT test or BTB test unless, in the judgment of the testing veterinarian, the reactor classification is indicated.

b. Known infected herds—All responses shall be recorded and the animals shall be classified as reactors.

2. Comparative cervical tuberculin test—All responses are to be measured to the nearest 0.5 mm.

a. Animals having a response to bovine PPD of less than 1 mm should be classified negative.

b. Animals having a response to bovine PPD of 1 through 2 mm, and also equal to or greater than their response to the avian PPD, shall be classified as suspects. Animals having a response to bovine PPD greater than 2 mm but equal to their response to avian PPD shall be classified as suspects, except when, in the judgment of the testing veterinarian, the reactor classification is indicated. Animals meeting the criteria for suspect classification in response to two successive CCT tests shall be classified as reactors.

c. Animals having a response to bovine PPD that is greater than 2 mm and is at least 0.5 mm greater than their avian PPD response shall be classified as reactors.

3. Suspects to the SCT test may be retested by either the CCT or the BTB tests. The CCT may be applied within 10 days following the SCT test injection or after 90 days. If the CCT test is applied within 10 days of the SCT test, the opposite side of the neck shall be used. The sample for the BTB test shall be taken after 12 days and optimally before 30 days after the SCT test injection. Animals positive to the CCT test or the BTB test shall be classified as reactors.

4. Suspects to the SCT test may be necropsied in lieu of retesting by supplemental tests and, if found without evidence of *M. bovis* infection by histopathology (including selected specimens submitted from animals having no gross lesions indicative of tuberculosis) or culture, shall be considered negative for tuberculosis.

B. Interstate or international movement

1. No captive cervid with a response to any tuberculosis test is eligible for international movement.

2. No captive cervid with a response to any tuberculosis test is eligible for interstate movement unless said animal is subsequently classified "negative for tuberculosis" based upon an official tuberculosis test or is consigned directly to slaughter.

3. Captive cervids that originate from accredited herds may be moved interstate without further tuberculosis testing, provided that they are accompanied by a certificate stating that such captive cervids originated from an accredited herd.

4. Captive cervids not known to be affected with or exposed to tuberculosis that originate from qualified herds may be moved interstate if the animals are accompanied by a certificate stating that they originate from a qualified herd and have been classified negative to an official tuberculosis test that was conducted within 90 days prior to the date of movement. If the qualifying test was administered within 90 days of movement, the animal(s) to be moved do not require an additional test.
5. Captive cervids not known to be affected with or exposed to tuberculosis that originate from monitored herds may be moved interstate if they are accompanied by a certificate stating that such captive cervids originate from a monitored herd and have been classified negative to an official tuberculosis test that was conducted within 90 days prior to the date of movement.
6. Captive cervids not known to be affected with or exposed to tuberculosis that originate from all other herds may be moved interstate, provided that (1) they are accompanied by a certificate stating that such captive cervids have been classified negative in response to two official tuberculosis tests conducted no less than 90 days apart, (2) the second test was conducted within 90 days prior to the date of movement, and (3) the animals were isolated from all other members of the herd during the testing period.
7. Captive cervids less than 12 months of age that originate from and were born in qualified or monitored herds may be moved without further tuberculosis testing, provided that they are accompanied by a certificate stating that such captive cervids originated from such herds and have not been exposed to captive cervids from a lower status herd.
8. Institutions that have been accredited by the American Zoo and Aquarium Association (AZA) are exempt from these requirements when movement is between accredited member facilities. Captive cervids in zoological parks that have been accredited by AZA are exempt from the regulations in this subpart when the captive cervids are moved directly interstate between AZA member facilities. Any captive cervids moved interstate that are not moved directly from an AZA member facility to another AZA member facility must be moved in accordance with the regulations in this subpart.
9. Except for captive cervids moving interstate under permit directly to slaughter or necropsy, each captive cervid or shipment of captive cervids to be moved interstate must be accompanied by a certificate issued within 30 days of the movement by a State or Federal animal health official or an accredited veterinarian. The certificate must state the number of the official eartag or other identification approved by the Administrator for each captive cervid to be moved, the number of captive cervids covered by the certificate, the purpose of the movement, the origin and destination of the captive cervids, the consignor, and the consignee.

C. Reporting of tests

A report of all tuberculosis tests (SCT, CCT, and BTB) shall be submitted in accordance with the requirements of the cooperating State and Federal officials. Results of the BTB test and other in vitro laboratory tests shall be reported by the authorized testing laboratories. This report shall include the identification of each animal by eartag number or tattoo or other identification, age, sex, and breed, record of all responses and a record of the size of the response, where indicated, and the test interpretation. Summary supporting BTB test data shall be included in reports submitted to State and Federal officials, and full supporting data shall be submitted on a case-by-case basis.

D. Procedures in affected herds

Disclosure of tuberculosis in any herd shall be followed by a complete epidemiologic investigation. All captive cervids in herds from which tuberculous animals originate and all captive cervids that are known to have associated with affected captive cervids or other affected animals shall be tested promptly. These procedures shall apply to adjacent and contact herds as well as to the evaluation and testing of possible source herds for the affected herd. Herds that have received exposed animals shall be tested following the slaughter or testing of the exposed animals. Every effort shall be made to ensure the immediate elimination of the disease from all species of animals on the premises. The herd shall be handled as outlined under Section G, Quarantine Procedures.

E. Disposition of tuberculin-responding captive cervids

1. Reactors shall remain on the premises where they were disclosed until a State or Federal permit for movement has been obtained. Movement for immediate slaughter will be within 15 days of classification directly to a slaughter establishment where approved State or Federal inspection is maintained. Alternatively, the animals may be destroyed and a necropsy may be conducted by, or under the supervision of, a State or Federal regulatory veterinarian trained in tuberculosis necropsy procedures.
2. Herds containing suspects to the SCT test shall be quarantined until the suspect animals are
a. Retested negative by the CCT test within 10 days of the SCT test injection *or*
b. Retested negative by the CCT test after 90 days, *or*
c. Retested negative by the BTB test after 12 days and optimally before 30 days following the SCT test injection *or*
d. Shipped under permit directly to a slaughter facility under State or Federal inspection, or they may be necropsied by, or under the supervision of, a State or Federal regulatory veterinarian trained in tuberculosis necropsy procedures. If such animals are found without evidence of *M. bovis* infection by histopathology (including selected specimens submitted from animals having no gross lesions indicative of tuberculosis) or culture, they shall be considered negative for tuberculosis.
3. Suspects to the CCT test or equivocal to the BTB test shall remain under quarantine until
a. Comparative cervical suspects are retested using the CCT test after 90 days *or*
b. BTB-equivocal animals are retested using the BTB test optimally before 60 days following the SCT test injection *or*
c. They are shipped under permit directly to a slaughter facility under State or Federal inspection, or necropsied by, or under the supervision of, a State or Federal regulatory veterinarian trained in tuberculosis necropsy procedures. Such animals shall be considered tuberculosis negative unless evidence of the disease is found by culture or histopathology (including selected specimens submitted from animals having no gross lesions).
4. An animal meeting the suspect criteria on two successive CCT or two BTB equivocal tests followed by one suspect CCT test shall be classified as a reactor and be identified as such. The testing veterinarian must justify exceptions in writing and must have the concurrence of State or Federal animal health officials.
5. An animal having two successive equivocal BTB tests may be retested with a CCT after 90 days of the SCT test injection, or may, at the owner s discretion, be sent to slaughter.

F. Identification of reactors (captive cervids)

Reactor captive cervids shall be identified by branding with the letter "T" on the left hip, not less than 2 inches (5 cm) nor more than 3 inches (7.5 cm) high, and by tagging with an official eartag bearing a serial number and the inscription "U.S. Reactor" attached to the left ear of each animal. In lieu of branding, the reactor(s) may be shipped to slaughter in an officially sealed vehicle or accompanied to slaughter by a StateFederal regulatory official, provided that such reactor(s) are tattooed with the letters "TB" in the left ear and these letters are sprayed on the left ear with yellow paint.

G. Quarantine procedures (captive cervids)

1. All herds in which reactor animals are disclosed shall be quarantined. The remaining exposed animals must remain on the premises where the disease was disclosed unless a State or Federal permit for movement to slaughter has been obtained. Movement for immediate slaughter must be directly to a slaughter establishment where approved State or Federal inspection is administered. Animals must be identified by official eartag. Use of "S" branding is required as per 9 CFR, Part 50, or animals must be shipped in an officially sealed vehicle or accompanied to slaughter by a StateFederal regulatory official. The "S" brand shall be applied to the left hip.
2. If captive cervid herds in which *M. bovis* is confirmed (affected herds) are not depopulated, they shall remain under quarantine. Such herds must also pass three consecutive whole-herd SCT tests to be released from quarantine. The BTB test may also be used, provided that it is used simultaneously with whole-herd SCT test. The sample for the BTB test may be taken at the time of injection or reading of the SCT test. All animals positive to either test shall be classified as reactors. The first test must be conducted 90 days or more after the last test yielding a positive animal, and two additional tests must be conducted at 180-day minimum intervals. The CCT test shall not be used in affected herds until the completion of two consecutive negative whole-herd tests, or two consecutive whole-herd tests with NGL reactors only, in which selected tissues are negative on the basis of histopathology and culture. Five annual whole-herd tests of all animals shall be given following the release from quarantine.
3. Captive cervid herds that have had a test of all eligible animals with NGL reactors only and no evidence of tuberculosis infection found by histopathology and culture of *M. bovis* (including selected specimens submitted from animals having no gross lesions indicative of tuberculosis) may be released without further restrictions.
4. Captive cervid herds in which one or more animals are found to have compatible or suggestive lesions by histopathology without the isolation of *M. bovis* may be released from quarantine following a negative 90-day retest of the entire herd and with the concurrence of the regional tuberculosis epidemiologist, provided that there is no known association with *M. bovis.*
5. Captive cervid herds with NGL reactors only (in which no evidence of tuberculosis infection is found by histopathology and culture of *M. bovis)* and such herds where all eligible animals cannot be tested shall be evaluated by the State and/or regional tuberculosis epidemiologist for possible release from quarantine.

H. Retest schedules for high-risk herds

1. In herds with a history of lesions compatible with or suggestive of tuberculosis by histopathology (without isolation of *M. bovis),* two annual whole-herd tests shall be given after release from quarantine. Herds with a bacteriologic isolation of a mycobacterial species other than *M. bovis* should be considered negative for bovine tuberculosis with no further testing requirements.

2. In a newly assembled herd on premises where a tuberculous herd has been depopulated, two annual whole-herd tests shall be given. The first test is to be given about 6 months after assembly of the new herd. If the premises had been vacated for 1 year, these requirements may be waived.

3. Exposed animals previously sold from known-infected herds shall be depopulated if possible or tested with the SCT test by State or Federal veterinarians. The BTB test may be used simultaneously with the SCT test as an additional diagnostic tool. The sample for the BTB test may be taken at the time of injection or reading of the SCT test. All animals with a positive response to either test shall be classified as reactors.

a. If bovine tuberculosis is confirmed in the exposed animal(s), the remainder of the receiving herd shall be classified as an infected herd and handled according to part IV, section G(2), of these UMR.

b. If negative to the test, the exposed animals will subsequently be handled as if they were part of the infected herd of origin for purposes of testing, quarantine release, and the five annual high-risk tests. The remainder of the herd shall be tested at the time of the initial investigation and retested in 1 year with the SCT test. Supplemental diagnostic tests may be used if needed.

4. Herds indicated as the source of an infected animal in slaughter traceback investigations shall be placed under quarantine within 30 days of notification to the Area Veterinarian-in-Charge, and a herd test shall be scheduled. Testing of source herds of slaughter animals having lesions of tuberculosis shall be done by State or Federal regulatory veterinarians. If the herd of origin is positively identified and *M. bovis* has been confirmed by bacterial isolation from the slaughtered animal, all animals responding to the SCT test shall be classified as reactors. In all other cases, supplemental diagnostic tests may be used.

5. Herds identified as the source of animals found to have tuberculous lesions in an affected herd shall be tested by State or Federal regulatory veterinarians using the SCT test. Responding animals may be classified as reactors or suspects. If classified as suspects, they may be retested by supplemental diagnostic tests.

WYOMING GAME AND FISH COMMISSION

CHAPTER 62

REGULATION FOR AQUATIC INVASIVE SPECIES

Section 1. Authority. These regulations are promulgated by authority of W.S. §23-1-102, W.S. §23-4-201 through W.S. §23-4-205.

Section 2. Regulation. The Wyoming Game and Fish Commission hereby adopts the following regulations governing Aquatic Invasive Species. This regulation shall remain in effect until modified or rescinded by the Commission.

Section 3. Purpose. The purpose of this regulation is to provide for the prevention, management, and control of aquatic invasive species.

Section 4. Definitions. For the purpose of this regulation, definitions shall be as set forth in Title 23, Wyoming Statutes, and the Commission also adopts the following definitions:

(a) "Aquatic invasive species" means exotic or non-native aquatic organisms that pose a significant threat to the aquatic resources, water supplies, or water infrastructure of the state. Priority aquatic invasive species include those not known to be present in Wyoming, but have a high potential to invade and other species determined by the Wyoming Game and Fish Commission to be a significant threat.

(i) Priority aquatic invasive species include:

(A) Zebra mussel - *Dreissena polymorpha*

(B) Quagga mussel - *Dreissena rostriformis*

(C) Rusty crayfish - *Orconectes rusticus*

(D) Bighead carp - *Hypophthalmichthys nobilis*

(E) Silver carp - *Hypophthalmichthys molitrix*

(F) Black carp - *Mylopharyngodon piceus*

(G) Viral Hemorrhagic Septicemia (VHS)

(H) Hydrilla - *Hydrilla verticillata*

(b) "Authorized Inspector" means a person who meets the requirement established by the Wyoming Game and Fish Department to inspect for aquatic invasive species.

(c) " Conveyance" means a motor vehicle, boat, watercraft, raft, vessel, trailer, or any associated equipment or containers, including but not limited to live wells, ballast tanks, bilge areas, and water hauling equipment that may contain or carry aquatic invasive species.

(d) "Decontaminate" means to wash, drain, dry, or thermally or otherwise treat a conveyance in order to remove or destroy aquatic invasive species.

(e) "Equipment" means an article, tool, implement, or device capable of containing or transporting water or aquatic invasive species.

(f) "Inspect" means to examine a conveyance in order to determine whether an aquatic invasive species is present, and includes examining, draining, or treating water in the conveyance.

(g) "Seal" means a locking device affixed to a conveyance that has been inspected or decontaminated.

(h) "Waters of the State" means all waters under the jurisdiction of the state of Wyoming.

Section 5. Inspection.

(a) Compliance with aquatic invasive species inspection requirements is an express condition of operation of a conveyance on waters of the state.

(i) Any person who refuses to permit inspection of their conveyance or refuses to complete any required removal and disposal of aquatic invasive species shall be prohibited from launching or operating the conveyance on any water of the state.

(ii) If a person refuses to allow inspection of a conveyance or to complete any required removal and disposal of aquatic invasive species prior to departure from any water of the state known to be infected by an aquatic invasive species, the conveyance is subject to impoundment until an aquatic invasive species inspection and decontamination is completed.

(b) Authorized inspectors may inspect any conveyance. Authorized inspectors shall perform decontaminations at the direction of a peace officer or with the voluntary agreement of any person transporting a conveyance.

(c) Inspections shall be conducted by:

(i) any peace officer; or,

(ii) any authorized inspector.

(d) All conveyances being transported from a water of the state known to be infested with aquatic invasive species shall be inspected and sealed prior to leaving the infested water. If an authorized check station is not open or otherwise available, the conveyance shall be inspected prior to launch in any other water of the state. All waters of the state determined to be infested shall be posted and a list of infested waters will be available from the Wyoming Game and Fish Department (Department).

(e) All persons transporting a conveyance shall go to an authorized aquatic invasive species check station and submit to an inspection prior to launching on any water of the state if within the past thirty (30) days the conveyance has been on a water with a verified aquatic invasive species infestation from any state or province, unless inspected and sealed by a state or province that has a Department approved aquatic invasive species program.

(f) Inspectors shall determine if there is reason to believe that aquatic invasive species are present by interviewing the person transporting the conveyance and using visual and tactile inspection methods. All inspections shall be documented on appropriate forms supplied by the Department.

(g) Conveyances are subject to inspection in accordance with Department procedures prior to launch onto, operation on or departure from any water of the state or conveyance staging areas, or authorized aquatic invasive species check stations. As part of all inspections, all compartments, equipment, and containers that may hold water, including, but not limited to, live wells, ballast and bilge areas shall be completely drained as directed by authorized inspectors.

(h) A conveyance determined to contain an aquatic invasive species shall be decontaminated using Department approved procedures before said conveyance shall be allowed to launch onto or operate on any water of the state.

(i) Any person operating a conveyance may be ordered to remove the conveyance from any water of the state or any conveyance staging area by any peace officer if there is reason to believe the conveyance was not properly inspected prior to launch or may otherwise contain aquatic invasive species. Once removed from the water, the conveyance shall be subject to inspection for the removal and disposal of aquatic invasive species.

(j) Any authorized inspector who, through the course of an inspection, determines that aquatic invasive species are present shall document the inspection, including but not limited to the type and number of aquatic invasive species suspected or detected and identification of the conveyance, including license plate numbers and hull or vehicle

identification numbers, if available. The authorized inspector shall advise the operator that the conveyance shall be required to be decontaminated according to Department procedures as soon as possible. Only peace officers have the authority to order decontamination, impoundment, or quarantine of a conveyance.

(k) Once a conveyance is inspected or decontaminated, a seal may be attached to the conveyance by a peace officer or authorized inspector. A copy of the completed seal receipt shall accompany all seals. Seals shall be attached to a conveyance as specified by the Department. A seal, once properly attached to a conveyance and when accompanied by the proper form, certifies a proper inspection or decontamination procedure. The owner of a watercraft sealed by an authorized inspector may remove the seal at their discretion. The Department shall recognize properly attached and documented aquatic invasive species inspection or decontamination seals from a state or province with a Department approved aquatic invasive species program. It shall be a violation of this regulation for any person to attempt to reattach any seal once it is removed from a watercraft.

Section 6. Decontamination.

(a) The Department shall only recognize decontamination methods described in this Section as proper Department procedures. All treatments shall be completed following all applicable laws, disposal methods, recommended safety precautions, safety equipment, and Department approved procedures.

(b) Decontamination shall be achieved by removal of the conveyance from any water body and eliminating the water from all compartments, equipment, and containers that may hold water, including but not limited to live wells, ballast tanks and bilges for a length of time as determined by the Department not to exceed thirty (30) days.

(c) If decontamination is not achieved by removal of the conveyance from any water body for at least 30 days, the following requirements apply:

(i) Decontamination of water compartments, equipment or containers in a conveyance to address the potential presence of an aquatic invasive species shall be accomplished by rinsing and flushing with water of at least 140 degrees Fahrenheit.

(ii) Decontamination of the exterior of a conveyance shall be accomplished by removing or destroying all aquatic invasive species, mud, plants, and organisms. The entire exterior of the conveyance and all intakes shall be thoroughly washed with water of at least 140 degrees Fahrenheit. A high pressure (minimum of 2500 psi) water wash or scrubbing will be used as necessary.

(iii) All compartments, equipment and containers that hold water including, but not limited to live wells, ballast and bilge areas, shall be flushed with water of at least 140 degrees Fahrenheit but not at high pressure. If a bilge pump is present, it

shall be operated until the bilge appears to be empty. The lower unit of the engine shall be thoroughly flushed with water of at least 140 degrees Fahrenheit.

(iv) After decontamination an authorized inspector or peace officer shall re-inspect the conveyance to ensure complete decontamination has occurred prior to the release of the conveyance.

(v) Proof of decontamination shall consist of a properly affixed seal or a copy of the Department decontamination form. Such forms shall document the identification of the conveyance, including license plate numbers and hull or vehicle identification numbers, reasons for the decontamination, any aquatic invasive species found, date and location of the decontamination, and method(s) of decontamination used. Authorized inspectors or peace officers may also apply a seal to document the decontamination procedure.

Section 7. Impoundment and Quarantine.

(a) All conveyances are subject to impoundment and quarantine by a peace officer if:

(i) the person transporting the conveyance refuses to allow an inspection of the conveyance to be conducted by an authorized inspector or peace officer;

(ii) a peace officer or an authorized inspector finds that an aquatic invasive species is present after conducting an inspection;

(iii) the person transporting the conveyance refuses to allow a decontamination of the conveyance when decontamination is ordered by a peace officer; or,

(iv) a peace officer determines a quarantine is necessary following decontamination.

(b) If the person in charge of the conveyance is not the registered owner, the registered owner shall be notified by mail, return receipt requested, within ten days of the location of the impounded conveyance. Such notification shall also include contact information for the peace officer ordering the impoundment. If the registered owner is present when the conveyance is ordered impounded, then the same information shall be provided to the registered owner at the time the impound order is issued.

(c) All impounded conveyances shall be held at the risk and expense of the owner. A conveyance held under impound for non-compliance with this regulation shall only be released after a peace officer is satisfied by inspection or quarantine that the conveyance is no longer a threat to the aquatic resources, water supplies, and water infrastructure of the state.

(d) Duration of conveyance quarantine shall be determined by the Department and shall not exceed thirty (30) days.

(e) An impounded conveyance shall not be released until a Department impound release form is signed and executed by a peace officer. It is the responsibility of the owner to coordinate with the Department for the release of the conveyance.

Section 8. Mandatory Reporting of Aquatic Invasive Species.

(a) Identification of an aquatic invasive species through sampling and monitoring procedures at a location where that species has not been known to exist shall be reported immediately to the Department.

(b) Any person that becomes aware or suspects an aquatic invasive species being present at a specific location in Wyoming shall report the aquatic invasive species presence within forty-eight (48) hours to the Department or any peace officer. An aquatic invasive species report shall include the date and time of the detection of the aquatic invasive species, the exact location of sighting (water body and specific location on the water body), the suspected species, and the name and contact information of the reporter. Samples collected of suspected aquatic invasive species shall be submitted to the Department within forty-eight (48) hours.

Section 9. Aquatic Invasive Species Check Stations.

(a) All persons transporting watercraft shall stop at authorized aquatic invasive species check stations that are established on their route of travel.

(b) Aquatic invasive species check stations shall be signed at boat dock areas, marinas, conveyance staging areas, or roads leading to watercraft launching areas.

(c) Check stations not located at boat dock areas, marinas, or conveyance staging areas shall be signed and established at a point on a highway or road clearly visible at a distance of not less than two hundred (200) yards in either direction. Check stations shall be at a point where flashing lights shall be visible to oncoming traffic for a distance of not less than two hundred (200) yards. The emergency lights on a marked law enforcement vehicle or a yellow flashing light on a marked non-enforcement vehicle shall be in operation.

Section 10. Aquatic Invasive Species Program Decal.

(a) All watercraft owners or operators shall purchase and display an Aquatic Invasive Species Program Decal valid for the current calendar year on their watercraft prior to launching on or entering into any waters of the state. For the purpose of this

Section, all inflatable watercraft ten (10) feet in length or less are exempt from this decal provision.

(b) Aquatic Invasive Species Program Decals shall not be limited in number and shall be sold through the Electronic Licensing System (ELS), designated license selling agents, and authorized personnel. The price of the decal shall be ten (10) dollars for motorized watercraft registered in Wyoming and thirty (30) dollars for motorized watercraft registered outside of Wyoming. The price of the decal shall be five (5) dollars for non-motorized watercraft owned by a Wyoming resident and fifteen (15) dollars for non-motorized watercraft owned by a nonresident.

(i) Watercraft owners or operators acquiring an Aquatic Invasive Species Program Decal for the purpose of this regulation shall adhere the decal on the starboard (right) side of the bow in such a manner that the decal shall be visible when the watercraft is underway. Owners or operators of registered watercraft shall adhere the decal on the starboard (right) side of the bow six (6) inches aft and directly in line with the watercraft registration number. Only the Aquatic Invasive Species Program Decal which is currently valid shall be displayed.

(ii) In the case of rental watercraft, it shall be the responsibility of the rental watercraft owner to ensure that a valid Aquatic Invasive Species Program Decal is properly displayed on the watercraft.

Section 11. Coordination with the Wyoming State Parks and Cultural Resources Department.

(a) The Department is directed to immediately engage the Wyoming State Parks and Cultural Resources Department (State Parks) for the purpose of entering into a Memorandum of Understanding (MOU) for the administration of the Aquatic Invasive Species Program on State Parks managed lands. Any MOU shall include due consideration of:

(i) the Commission's and State Parks' statutory duties under the Aquatic Invasive Species program (W.S. §23-4-201 through W.S. §23-4-205);

(ii) the primary jurisdictional authority of State Parks over State Parks land; and,

(iii) the Commission's financial and personnel commitments to the remaining critical bodies of water throughout the state.

(b) The Department shall coordinate annually with State Parks to determine complimentary efforts to control the spread of aquatic invasive species in the waters of the state and any necessary amendments to the MOU.

WYOMING GAME AND FISH COMMISSION

CHAPTER 49

REGULATION GOVERNING PRIVATE FISH STOCKING

Section 1. Authority. These regulations are promulgated by authority of Wyoming Statutes §23-1-102(a)(xiv), §23-1-103, §23-1-302, §23-4-101, §23-4-102 and §23-6-207.

Section 2. Regulation and Effective Date. These regulations are effective January 1, 2012, and shall remain in effect until modified or rescinded by the Commission.

Section 3. Definitions. For the purpose of this regulation, definitions shall be as set forth in Wyoming Statutes, Title 23 and Wyoming Game and Fish Commission regulations, and the Commission also adopts the following definitions:

(a) "Aquatic Invasive Species" means exotic or non-native aquatic organisms that pose a significant threat to the aquatic resources, water supplies, or water infrastructure of the state. Priority aquatic invasive species include those not known to be present in Wyoming, but have a high potential to invade and other species determined by the Wyoming Game and Fish Commission to be a significant threat.

(b) "Broker" means an individual or entity that acts as an intermediary between the hatchery of origin and the person possessing a private fish stocking authorization.

(c) "Drainage" means the river or stream proper and the area of land, including all streams and standing waters, which drain into that river or stream.

(d) "Environmental Assessment" means identification and analysis of potential effects on wildlife resources as defined by the Department.

(e) "Fish Stocking" means the release of fish into Wyoming waters.

(f) "Private Fish Hatchery" means any aquatic facility not owned or operated by federal, state, local or tribal government agencies used for propagating, rearing or producing any or all life stages of fish.

(g) "Transgenic" means modifying the genetics of an organism with inserted deoxyribonucleic acid (DNA) that originated in a different species, using genetic engineering techniques.

Section 4. Prohibited Stocking.

(a) No fish, fish eggs, or fish gametes shall be stocked in Wyoming waters unless authorized by the Chief of Fisheries.

(b) No amphibians, mollusks, crustaceans, their viable gametes (eggs and sperm), fertilized eggs, or any hybrid shall be stocked into the waters of the State of Wyoming unless authorized by the Chief of Fisheries.

(c) The possession or stocking of transgenic fish, amphibians, mollusks or crustaceans is prohibited.

(d) No aquatic invasive species or fish that may pose a threat to existing wildlife populations shall be authorized for stocking.

Section 5. Sanction of a Private Fish Hatchery to Stock Fish. Private fish hatcheries within the State of Wyoming shall be licensed to operate and transport fish as defined in Wyoming Game and Fish Commission Regulations. Any private fish hatchery outside the State of Wyoming that meets Commission Regulations regarding the importation and stocking of fish, intending to stock fish in Wyoming shall apply for and receive an importation permit from the Department. Authorization of an importation permit shall be based on the criteria defined for out-of-state private fish hatcheries and approved on an annual basis or as defined by the Department. Failure to comply with any portion of this regulation may result in Department revocation of authorization to stock fish in Wyoming.

Section 6. Application for Authorization to Stock Fish.

(a) Any person intending to stock fish in waters on privately owned lands shall submit an application for Private Fish Stocking Authorization, on forms provided by the Department, to the Chief of Fisheries at least ten (10) business days before the intended stocking date. A separate application is required for each body of water or stream for which fish stocking authorization is requested and for each time stocking is to occur.

(b) The Department may deny an application for private fish stocking if information is falsified on the application, or if the application is not completely and correctly filled out, or if the fish are requested from an unapproved fish hatchery, or if fish species requested are not compatible with species already present in the drainage or conflict with Departmental management goals for the drainage.

Section 7. Terms of Authorization.

(a) Upon approval the applicant shall stock the authorized stocking site within thirty (30) days following the stocking date indicated on the Private Fish Stocking Authorization. If the anticipated stocking date precedes the authorized date or exceeds the thirty (30) day time period, the applicant, owner, lessee, or agent of the approved source shall submit a request for an amended stocking date on the Private Fish Stocking Authorization prior to stocking.

(b) Any alterations or amendments to a Department issued Private Fish Stocking Authorization by the requesting party are prohibited. No deviations from a Private Fish Stocking Authorization shall be permitted. If any changes to an authorization are desired, a new application must be submitted for approval. Upon approval, the original authorization shall be void.

(c) The size, species or source identified on a Private Fish Stocking Authorization are specifically defined by the Chief of Fisheries and shall not deviate from the original authorization without further approval. Number of fish to be stocked may exceed the authorized number by a maximum of ten percent (10%).

Section 8. Types of Fish Stocking. Each fish species transported shall be held in separate containers to facilitate species identification unless the fish in the container are to be stocked into one (1) individual stocking site authorized for multiple species of game fish and all game fish in the container are released at that site. Nongame species shall be held in separate containers from game fish.

(a) Game Fish Stocking. Fish shall meet the size requirements specified on the Private Fish Stocking Authorization by the Department to facilitate species identification.

(b) Nongame Fish Stocking.

(i) Vegetation Control. Only grass carp (*Ctenopharygodon idellus*) that are Coulter counter certified triploid by the U.S. Fish and Wildlife Service, certified free of Asian tapeworm (*Bothriocephalus acheilognathi*) and are from a source certified free of all life stages of the zebra mussel (*Dreissena polymorpha*) shall be authorized for stocking to control aquatic vegetation. A copy of these certifications must be provided to the Department at least ten (10) working days prior to stocking.

(ii) Mosquito control. Only plains topminnow (*Fundulus sciadicus*) or plains killifish (*Fundulus zebrinus*) shall be authorized for stocking to control mosquitoes. Fish species requested for mosquito control shall be considered for authorization only if that species is 1) native to the drainage, or 2) is established in the drainage and stocking in the locations requested is considered by the Department to be compatible with aquatic species in that drainage.

(iii) Any other nongame fish species requested shall be considered on a case-by-case basis by the Chief of Fisheries.

Section 9. Source of Fish For Stocking. Only fish from Department approved private fish hatcheries, or other approved sources shall be authorized for private fish stocking. A list of approved private fish hatcheries is available from the Department.

Section 10. Transportation of Fish. Vehicles used for the transport of live fish for private fish stocking shall be placarded indicating that the equipment is being used to transport live fish. Letters, numbers, or symbols displayed on the placard shall be at least three (3) inches in height, excluding shading and bordering, and shall be of a color that contrasts with the placard background color. Anyone in the process of transporting fish for the purpose of private stocking must be in possession of a valid Department Private Fish Stocking Authorization and any other permits, receipts, bill of sales, or any other documents required by Wyoming Statute or Wyoming Game and Fish Commission Regulations.

Section 11. Records. Upon completion of fish stocking under a Private Fish Stocking Authorization, the applicant shall, within fifteen (15) days, submit to the Fish Division a copy of the Private Fish Stocking Authorization signed by the applicant, owner, lessee, or agent of the approved source and a copy of a receipt of delivery. In the event that a broker transports or otherwise possesses the fish, the approved applicant shall submit a copy of the Private Fish Hatchery Fish Transportation Receipt signed by the broker, a copy of a receipt of delivery of fish from the approved source provided the broker, and a receipt of delivery from the broker.

Section 12. Transfer to Other Waters Prohibited. Fish stocked under the authority of a Private Fish Stocking Authorization shall only be stocked in the water identified on the authorization. Stocking of fish in other waters or the transfer of stocked fish to any other waters is prohibited.

Section 13. Species New to A Drainage. If an applicant for a private fish stocking authorization requests to stock a fish species not already existing in a drainage, the applicant shall be required to prepare and submit an environmental assessment as defined by the Department at the expense of the applicant. The Department shall review the environmental assessment and private fish stocking authorization application for final approval or denial.

Section 14. Removal of Unauthorized Species. Stocking of unauthorized fish species may require removal of said species or complete depopulation within a time frame and method determined by the Department at the expense of the private fish stocking applicant.

Section 15. Violation of Commission Regulations. Failure to abide by the provisions of this regulation shall be punishable as provided by Wyoming Statutes for violation of Commission regulations.

Section 16. Savings Clause. If any provision of this regulation is held to be illegal or unconstitutional, such a ruling shall not affect other provisions of this regulation which can be given effect without the illegal or unconstitutional provision; and, to this end the provisions of this regulation are severable.

WYOMING GAME AND FISH COMMISSION

By:

Fred Lindzey, President

Dated: November 17, 2011

Section 12. Violation of Commission Regulations. Failure to abide by the provisions this regulation shall be punishable as provided by Wyoming statutes for violation of Commission regulations.

Section 13. Savings Clause. If any provision of this regulation is held to be illegal or unconstitutional, such a ruling shall not affect other provisions of this regulation which can be given effect without the illegal or unconstitutional provision; and, to this end, the provisions of this regulation are severable.

WYOMING GAME AND FISH COMMISSION

By: Edward Mignery
Ed Mignery, President

Dated: June 17, 2010

WYOMING GAME AND FISH COMMISSION

CHAPTER 51

REGULATION GOVERNING FISH HATCHERIES

Section 1. Authority. These regulations are promulgated by authority of W.S. §23-1-102(a)(xiv), §23-1-103, §23-1-302, §23-4-101, §23-4-102, §23-4-103, §23-4-104 and §23-6-207.

Section 2. Effective Date. These regulations are effective January 1, 2012, and shall remain in effect until modified or rescinded by the Commission.

Section 3. Definitions. For the purpose of this regulation, definitions shall be as set forth in Title 23, Wyoming Statutes, Wyoming Game and Fish Commission regulations, and the Commission also adopts the following definitions:

(a) "Aquaculture Facility" means any combination of buildings, ponds, tanks, raceways, or any other structure used for the propagating, rearing, or producing of aquatic wildlife, excluding hobby aquariums or natural bodies of water. Buildings, ponds, tanks, raceways, or other structures used for the containment of aquatic wildlife separated by more than one-quarter (¼) mile, or facilities that drain to, or are modified to drain to, different waters are considered to be separate facilities, regardless of ownership, and require a separate fish hatchery license and surety bond.

(b) "Brokered" means the activity when any fish, fish eggs or fish gametes are contracted for sale, transport or stocking but are not under possession of a fish hatchery of origin or the applicant of a private fish stocking authorization.

(c) "Catchout Pond" means an artificial pond of ten (10) surface acres of water or less, located completely within the boundaries of a licensed fish hatchery, where fish shall be caught by legal fishing methods.

(d) "Fish Hatchery" means an aquaculture facility not owned or operated by federal, state, local or tribal government agencies used for propagating, rearing or producing any or all life stages of fish.

(e) "Non-Salmonid Fish Hatchery" means aquaculture facilities used for propagating, rearing, or producing any or all life stages of fish not in the family Salmonidae.

(f) "Salmonid Fish Hatchery" means any aquaculture facility used for propagating, rearing, or producing any or all life stages of the family Salmonidae.

Section 4. Application for license.

(a) Any person desiring to operate a fish hatchery shall submit proper fees and make application on forms provided by the Department.

(i) A map and legal description to the quarter (1/4) quarter (1/4) section, or lat-long coordinates in degrees, minutes and seconds, or in universal transverse mercator (UTM) coordinates of all fee title lands on which the hatchery will operate shall be included. If fee lands are leased, a copy of the lease agreement shall be included with the application form.

(ii) Application for a new fish hatchery shall include, but not be limited to, a diagrammatic sketch of all aquaculture facilities, water supplies and effluent drainages. The name of the stream or body of water into which effluent from the hatchery is discharged or would possibly be discharged into in the event of flooding shall be provided. Any ponds shall be identified with a unique name or number and size in surface acres indicated.

(iii) The applicant shall provide the name and source of the species of all fish, fish eggs, or fish gametes to be possessed, propagated, sold, traded, or transported to or from the fish hatchery for which the license application is being made. No fish, fish eggs, or fish gametes exclusive of those species licensed for propagation by the hatchery shall be imported into or held in, or otherwise access hatchery facilities or waters. It shall be a violation of this regulation for a fish hatchery licensee to possess, receive, ship, purchase, rear, sell or otherwise dispose of any species of fish, fish eggs, or fish gametes not listed on the license approved by the Department.

(b) A fish hatchery licensee shall not modify operations from those described on the original license without an approved amendment. A detailed request specifying proposed amendments to the original license shall be submitted to the Chief of Fisheries for consideration of approval.

(c) No wild fish may be contained or captured within a new or proposed aquaculture facility as a result of facility construction, impoundment of waters, or utilization of existing ponds.

(d) Under special circumstances, the Chief of Fisheries may grant an exception to the one-quarter (¼) mile stipulation for aquaculture facility separation. Any exception shall be evaluated upon formal written request submitted to the Department by the applicant.

(e) Application for transfer of an existing fish hatchery to a new owner shall include a record of fish, fish eggs, and fish gametes upon transfer. A new owner shall receive the last three (3) years fish production records from the previous owner.

(f) A fish hatchery license expires on the last day of the calendar year for which the license was issued. A new fish hatchery license shall be obtained prior to the importation or removal of any fish, fish eggs, or fish gametes to or from the hatchery.

Section 5. Facility Inspection.

(a) Before a license is issued to operate a new fish hatchery or an existing fish hatchery transferred to a new owner, Department personnel shall review the applicant's proposed aquaculture facilities to insure protection of Wyoming's wildlife resources. Aquaculture facilities shall be constructed to meet Department approval prior to importation or possession of fish, fish eggs or fish gametes.

(b) Before an existing fish hatchery can be transferred to a new owner, the Department may inspect aquaculture facilities and request full disclosure of all fish production records for the past three (3) years of operation including complete inventory of fish, fish eggs, or fish gametes at time of transfer.

(c) A fish hatchery owner or operator shall allow inspection of aquaculture facilities, fish, fish eggs, or fish gametes by Department personnel during reasonable hours and with reasonable notice.

Section 6. Records. On forms provided by the Department, a licensee shall maintain on the premises of the fish hatchery, or at his residence, legible, current, accurate and complete fish production records for a minimum of the past three (3) years to date.

(a) Records shall identify the species, numbers, age, and size of all fish, fish eggs, and fish gametes in possession and that have been received, shipped, purchased, reared, brokered, sold, or disposed of, or that have escaped; and include the names and addresses of all recipients, fish rearing locations, purchasers, and suppliers of all fish, fish eggs, or fish gametes that are reared by or brokered through the hatchery, the identifying number of any permits required for a transaction, and the date of all transactions. Upon request, all records shall be produced for inspection by the Department.

(b) Inventory records, or legible copies, shall be submitted semi-annually to the Chief of Fisheries on forms provided by the Department by January 15 and July 15 for activities that occurred during the six (6) month period prior to the month records are due.

(c) All pertinent fish health inspection reports shall be provided for inspection to the Department upon request as defined in Appendix I, Section 2 of Wyoming Game and Fish Commission Chapter 10 Regulation. For the purpose of this regulation, fish health inspection reports shall be deemed current for a period of one (1) year from the last date of the fish health results.

Section 7. Escaped or Disposed of Fish. If fifty (50) pounds or more of fish escape or are disposed of into the drainage receiving effluent from a fish hatchery, the Chief of Fisheries shall be notified within twenty-four (24) hours.

Section 8. Stocking of Fish or Fish Eggs. The licensee, his agent, or the operator of a fish hatchery shall only provide fish, fish eggs or gametes for the purpose of stocking into waters of the State of Wyoming after first obtaining a copy of a fish stocking authorization issued to the approved applicant by the Department.

(a) The licensee, operator or broker of a fish hatchery shall not make any deviations from a fish stocking authorization.

Section 9. Transportation of Fish, Fish Eggs, or Fish Gametes. Vehicles used for the transport of fish, fish eggs or fish gametes to or from a fish hatchery shall be placarded with signage indicating that the equipment is being used to transport fish, fish eggs or fish gametes. Letters, numbers, or symbols displayed on the placard shall be at least three (3) inches in height, excluding shading and bordering, and shall be of a color that contrasts with the placard background color. Vehicle operators transporting fish, fish eggs or fish gametes shall be in possession of all documents required by Wyoming Statute and Wyoming Game and Fish Commission regulations.

Section 10. Notification and Disposition of Diseased Fish, Fish Eggs and Fish Gametes. The licensee or his authorized agent shall notify the Wyoming Game and Fish Department Fish Health Laboratory within forty-eight (48) hours if there is any fish health problem at their aquaculture facility resulting in unusual fish behavior, or any abnormal change in fish condition or appearance, or increased mortalities. All fish, fish eggs, and fish gametes identified as suspect by a Department aquatic animal health inspector must be confined to their rearing units until the health problem has been evaluated. If a Department aquatic animal health inspector confirms a pathogen of concern, as listed in Wyoming Game and Fish Commission Regulation, Chapter 10, Appendix I "Cold Blooded Wildlife Inspection Procedures", it shall be a violation of this regulation to move or remove fish, fish eggs and fish gametes exposed to or which have contracted a pathogen of concern without prior authorization from the Department. Fish killed by a pathogen of concern shall be disposed of as prescribed by the Department.

Section 11. Prohibition of Fish Transport. Any violation of the conditions of a fish hatchery license shall result in the prohibition of transporting fish, fish eggs, or fish gametes into or out of the fish hatchery. Prohibition of fish transport will be lifted when corrective actions are completed to the satisfaction of the Department and written approval by the Chief of Fisheries to resume full operation is received.

Section 12. Catchout Ponds. Fish hatcheries may operate one (1) catchout pond per licensed location for the sole purpose of fishing and shall not be operated for fish, fish egg, or fish gamete production.

(a) Method of Take. Fish can only be taken or fished for in a catchout pond by legal fishing methods. Each hatchery owner may set creel limits. All other Commission fishing regulations apply. A fishing license is not required.

(b) Receipt for Removal of Fish. The licensee shall issue a receipt to any person removing fish from licensed premises on forms provided by the Department.

(c) Transportation of Live Fish Prohibited. No person shall transport live fish, live fish eggs, or fish gametes from a catchout pond except as authorized by the Department.

Section 13. Salmonid Fish Hatcheries.

(a) Fish health inspections. Annual fish health inspections of all fish located on the aquaculture facility will be conducted in accordance with Wyoming Game and Fish Commission Regulation, Chapter 10, Appendix I "Cold Blooded Wildlife Inspection Procedures". Any new fish hatchery shall meet all requirements for specific pathogen free inspection before any fish, fish eggs or fish gametes can be transported outside of the hatchery.

(b) Fish, fish egg, or fish gamete importation. All importations of salmonid fish, fish eggs or fish gametes require a current health inspection and Department importation permit in accordance with Wyoming Game and Fish Commission Regulation, Chapter 10, Appendix I "Cold Blooded Wildlife Inspection Procedures".

(c) Inventory. The owner or operator of a salmonid fish hatchery shall provide an accurate inventory of the number, age, and size of each species of fish or fish eggs present at the

facility on a form provided by the Department. Inventory numbers can be established by physical count or accurate accounting records.

Section 14. Non-Salmonid Fish Hatcheries.

(a) Broodstock Development. All brood fish received by a fish hatchery shall originate from a Department authorized aquaculture facility and shall be inspected by Department personnel before release into hatchery waters. A minimum of three (3) working days prior to brood stock arrival, the owner or operator shall notify the Chief of Fisheries to schedule an inspection of the brood fish.

(i) The number of brood fish authorized to be received by a fish hatchery shall be determined by the Department on a case-by-case basis.

(ii) Fathead minnows (*Pimphales promelas*) shall only be received as adult fish and cannot be sold for bait or stocked for a period of six (6) months beginning on the day of receipt.

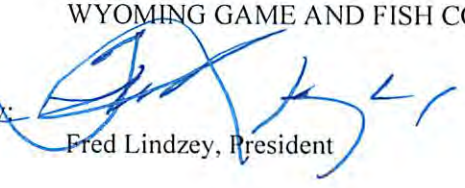
Section 15. Revocation of License. Failure to comply with any portion of this regulation may result in a Department request to the Commission for revocation of license. Revocation of a license by the Commission shall be carried out in accordance with Chapter 27 Rules of the Regulation "Practice Governing Contested Cases before the Wyoming Game and Fish Commission".

Section 16. Disposition of Fish, Fish Eggs, or Fish Gametes Upon Revocation of or Denial of or Failure to Renew License. If a fish hatchery license is revoked or renewal application denied or a licensee fails to renew his license after a fish hatchery has begun operations, no fish or fish eggs or fish gametes may be imported into or removed from the facility. All fish, fish eggs, or fish gametes at the facility must be inventoried and disposed of in a manner approved by the Department within sixty (60) days of the date of license revocation or renewal denial or failure to renew. After this sixty (60) day period, all fish, fish eggs or fish gametes on the premises shall become the property of the State and may be disposed of by the Department.

Section 17. Violation of Commission Regulations. Failure to abide by the provisions of this regulation shall be punishable as provided by Wyoming Statutes for violation of Commission regulations.

Section 18. Savings Clause. If any provision of this regulation is held to be illegal or unconstitutional, such a ruling shall not affect other provisions of this regulation which can be given effect without the illegal or unconstitutional provision; and to this end, the provisions of this regulation are severable.

WYOMING GAME AND FISH COMMISSION

By: 

Fred Lindzey, President

Dated: November 17, 2011

E

EXAMPLE BMPS AND SOPS

National Analysis
of Grass Carp
(*Ctenopharyngodon idella*)

USFWS Standards for Producers and Memorandum of Agreement

Standards for Triploid Grass Carp Producers

The USFWS only provides the Inspection and Certification service to producers that want to cooperate and sign an MOA.

The Grass Carp Producer, prior to the inspection date, will examine the checklist of requirements for Triploid Grass Carp Producers, and ensure that the conditions of the protocol will be met and checked off on the "Checklist for Inspectors and Triploid Grass Carp Producers" (i.e., available diploid controls, a working Coulter Counter, etc.).Penalties**: C-3, C-4, B-2**

All grass carp, in an identified lot will be individually tested by the producer using particle sizer technique prior to the inspection. The USFWS Inspection consists of a retesting by the producer, in the presence of the Inspector, of 120 fish randomly selected by the Inspector from the identified lot of alleged 100 percent producer tested triploid grass carp.

Producers must have a fully operational particle sizer (such as the Coulter Counter) with channelizer, and trained personnel available to process fish for the Inspection**.** A fully operational particle sizer shall be defined as one where the modal peak for triploid screened fish is at least one channel to the right of a 2.8 micron bead modal peak. Penalties: **B-2**

The Grass Carp Producer will provide the diploid grass carp control fish. The fish will be the same relative age/size as the group of fish that are to be certified for triploidy. As an option, 2.8 micron polystyrene beads may be used as a standard to calibrate when diploids are unavailable at the time of the inspection.

The Grass Carp Producer will maintain the isolated Lot(s) of alleged 100 percent individually producer tested triploid grass carp in containment units at least 100-ft. away from production ponds and at least 6 ft away from tanks holding untested/Diploid Grass Carp to reduce the chance of inadvertent mixing of triploids and diploids. Penalties: **C-3, C-4**

All tanks in the containment facility will be clearly labeled as either untested, diploid, producer tested triploid or USFWS certified Triploids. Penalties**: C-4**

Containment units must be provisioned with water that is clear enough to allow the isolated fish population to be viewed by the USFWS Inspector for the purposes of visually estimating fish numbers and confirming the absence of other species whose presence would indicate potential adulteration of screened fish. In the event the water in the holding tanks is not clear enough due to a unique weather event or temporary equipment malfunction the inspector will offer to work with the producer to find an acceptable alternative method of determining the disposition of fish in the containment unit. Penalty: **D-8**

Upon the arrival of the inspector the producer will provide the inspector with the "Checklist for Inspectors and Triploid Grass Carp Producers" with the table of tank locations and number of alleged 100 percent triploid fish completed and pre-inspection checklist completed. The producer will randomly select 120 fish under the supervision of the inspector. The producer may not pre select 120 fish prior to the arrival of the inspector. Penalty: **D-7**

The grass carp producer will analyze diploid controls or beads on their particle sizer under the supervision of the inspector to ensure that their particle sizer is fully functional prior to conducting an inspection.

The grass carp producer will then individually retest all 120 randomly selected fish from the alleged 100 percent individually producer tested triploid grass carp lot under the supervision of the inspector. Each sample will be channelized under the direction of the inspector. The channelizer reading from at least every 10^{th} sample will be manually recorded by the inspector on the "Checklist for Inspectors and Triploid Grass Carp Producers". Each individual fish will be secured in an identifiable location for possible retesting if suspected of being diploid. The fish can be released to the general triploid population after the inspector confirms the ploidy status of all 120 fish. Penalty: **D-6**

If a blood sample results in a questionable reading when it is channelized the producer will follow the facility protocol for screening a suspect sample under the direction of the inspector. At the very least the protocol will contain the following elements:

Pour original sample into new, clean cuvette and retested up to two times. If Ok continue with inspection.

When suspect sample is present producer stops operation without communicating location of fish to bleeding crew.

Inspector notes location of suspect fish and retrieves all suspect fish in a containment unit (e.g. two fish in a net) and returns to the sample stand.

Collect new blood sample in a new, clean, cuvettes from all fish in group up to two times

Run samples and make determination of ploidy of new blood samples.

Penalty: **D-6**

The inspection will be failed if the inspector observes any non-triploid fish. In the event of a type A failure (a diploid is found in the course of testing the 120 fish sample) the lot fails inspection and cannot be certified. All fish in that lot of fish must be individually retested, by the Producer, before another inspection can be rescheduled. Penalty: **A-1**

In the event of a type B, C or D failure, the standard for which the producer was out of compliance must be corrected prior to scheduling another inspection. The inspector must indicate in writing using the standardized letter the standards that are out of conformance resulting in the failure so that the producer can correct the problem. The producer will identify the corrective actions that will be taken on the same letter. Both parties will sign the letter.

A lot is defined as the number of fish recently individually screened by the producer to remove non triploid fish and held in isolation which may potentially be shipped within 6 calendar days. The inspector will calculate the number of fish permitted to be certified and sold from this lot as the number of fish identified in certificate requests by the producer at the time of inspection plus 30% to be potentially shipped in the next six days. The inspector records the number on the "Checklist for Inspectors and Triploid Grass Carp Producers". An arbitrary maximum number of 6,000 fish per lot is being assigned until empirical data on actual diploid incidence rates in failed lots can be reviewed and a more accurate statistical model applied to the historical data to establish higher or lower lot sizes based on the 120 fish sampling protocol. Multiple inspections can be

performed in a day to accommodate larger orders. For larger orders lots will be divided into lots of 6,000 grass carp or less. The lots will be inspected and certified independently.

The lot of alleged 100 percent individually producer tested triploid grass carp is inspected by the USFWS Inspector. If they pass inspection, the inspected lot of fish is held in isolation. Certificates may be issued by the inspector for up to 6 calendar days on fish sold from the inspected lot. If fish are added to the inspected lot the certifications on remaining fish from the inspected lot are null and void. If fish are added to the inspected lot no certifications on remaining fish from the lot can be written. Fish must pass re-inspection before they can be certified and sold.

Any fish from the inspected population of fish not sold within six calendar days of inspection must be re-inspected and pass inspection before new certificates can be issued for shipment/sale. Unsold fish from the previous lot may be pooled with alleged 100 percent individually producer tested triploid grass carp to form a new lot for USFWS inspection.

The producer is responsible for organizing delivery of certificates written after the inspector leaves the producer's site on the day of the inspection. This can be accomplished in several different ways depending on the urgency of the request (1) mailed by regular mail, (2) sent via courier service using the producer's charge code, (3) picked up by the producer at a location convenient for the inspector.

If visual examination by the Inspector identifies some phenotypic anomaly, further scrutiny and investigation would not be the responsibility of the Inspector under the Grass Carp Program. If such work is desired by the Grass Carp Producer, it should be directed to a fish veterinarian, a certified fish health specialist, or a fish pathologist.

Grass Carp Producers will retain records of their Certification transactions for 7 Years and provide original, embossed, Certificates to truck drivers, and others, delivering the fish to the place of destination. Penalty: **E-10**

The USFWS provides triploidy certification; it is the obligation of the producer to comply with laws, regulations, and guidelines of the States.

Fees for service will be handled by check, issued to the Inspector at the time of the Inspection or by other agreed terms with the USFWS, and made payable to the U.S. Fish and Wildlife Service for the number of fish Certified to be shipped. Penalty: **E-15**

The Grass Carp Producer will not directly participate in the selling of grass carp as USFWS certified triploid grass carp in intrastate and interstate shipments without valid USFWS certificates. Penalty: **E-10, E-13**

The Grass Carp Producer must not be convicted of a felony lacey act violation related to the triploid grass carp business. Penalty: **E-14**
The Grass Carp Producer will not falsify any certificates or documents. Penalty: **E-10**
Number of fish on certificate must match number of fish on invoice/bill of lading**.** Penalty**: E-9**

UNITED STATES DEPARTMENT OF THE INTERIOR (DOI)
U.S. FISH AND WILDLIFE SERVICE (USFWS)

National Triploid Grass Carp Inspection and Certification Program (NTGCICP)
Memorandum of Agreement (MOA)

Subject: MOA between USFWS and Triploid Grass Carp Producers

I. Project Description:

The National Triploid Grass Carp Inspection and Certification Program (NTGCICP) is a quality assurance program that helps State Resource Agencies ensure effective aquatic resource management, where states may wish to regulate triploid grass carp for the control of aquatic nuisance vegetation. This quality assurance is based on a working partnership between the USFWS and Triploid Grass Carp Producers who agree to participate in the NTGCICP. The Memorandum of Agreement formalizes the duration of the Agreement, the extent and tenets of the Agreement, and the conditions under which the Agreement might be terminated by USFWS.

II. Background and Scope of NTGCICP:

Authorization

The inspection service was addressed by the Senate and House of Representatives of the United States of America, in the first session of the 104th Congress, assembled in Washington, DC, January 4, 1995. Through Congressional Action (S.268): "The Secretary of the Interior, acting through the Director of the U.S. Fish and Wildlife Service, may charge reasonable fees for expenses to the federal Government for triploid grass carp certification inspections requested by a person who owns or operates an aquaculture facility."

Scope of Inspection Program

The U.S. Fish and Wildlife Service (USFWS) provides Triploid Grass Carp inspection services for natural resource agencies in the United States (and in other countries), to help the States, and others, protect their aquatic habitats. The NTGCICP is available to aquaculture facilities in any State that allows production of triploid grass carp. The current NTGCICP standards reflect input from private grass carp producers and State resource agencies working though a collaborative and inclusive process. The critical elements of the Program are described in five categories: (1) Standards for USFWS Inspectors; (2) Standards for Grass Carp Producers; (3) Checklist for Inspectors and Producers; (4) Standards for Collection and Fees, and (5) Standard Penalties and Fees for Program Non-Conformance.

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III. Quality Assurance Tenets of MOA

The NTGCICP provides assurance to conservation agencies, that USFWS Certified "lots" of triploid grass carp to be shipped from cooperating private triploid grass carp producers, do not, within the confidence limits of the USFWS Inspection Program, contain diploids.

The USFWS and cooperating triploid grass carp producers desire high standards to ensure the integrity of the NTGCICP. Six objective tenets of the MOA formalize the agreement between USFWS and TGC-Producers that cooperate within the framework of the NTGCICP. These tenets are as follows:

1. Producers and Inspectors must understand and comply with National Standards established as a framework for quality assurance under the NTGCICP. Failure to comply will lead to penalties, and, if persistent, can potentially lead to termination of the MOA. There are five sets of Standards which were developed though a collaborative process that included inputs from federal, state, and private sectors. These Standards are referenced at the following USFWS website and are appended to this MOA:

   http://www.fws.gov/warmsprings/FishHealth/frgrscrp.html

   Standards for USFWS Inspectors

   Standards for Grass Carp Producers

   Checklist for Inspectors and Triploid Grass Carp Producers

   Standards for Collection of Fees

   Standard Penalties and Fees for Program Non-Conformance

2. The MOA between the USFWS and the Cooperating TGC-Producer will be initiated on a three-year basis. To renew the MOA, the TGC Producer must contact a USFWS inspector and arrange a meeting with the USFWS no less than 90-days prior to termination of the 3-year Agreement. Subsequent to meeting with the producer, the NTGCICP office will review findings and make a recommendation. Based on that recommendation, the originating USFWS Regional Office will determine whether to extend the MOA Inspection and Certification privileges for another three-year period. TGC-Producer could appeal a negative renewal recommendation to the USFWS Regional Office.

3. Participation in the NTGCICP is not automatic, and both USFWS and triploid grass carp (TGC) producers will periodically re-evaluate TGC-Producer cooperation and conformity with regard to the framework Standards of the NTGCICP. In this regard, the USFWS will meet with Cooperating TGC Producers at least every three years, or when incidences of non-conformity occur in the interim. Documentation of producer non-conformance will be considered a serious issue, and the cooperating TGC Producer would be obligated to respond. No subsequent TGC inspections will occur until the inspector is satisfied that issues were adequately resolved. Continued non-conformance would lead to a letter-of-notice by USFWS. Depending on the degree of severity and/or persistence of operational

non-conformance, the USFWS would have the right to terminate Inspection and Certification services (as defined by the MOA) to a TGC Producer not complying with NTGCICP Standards and the MOA. TGC-Producers may appeal the Termination by writing to the USFWS signatory (office) within 30-days from the date of the Notice-of-Termination.

{*Types of non-conformance have been identified by USFWS and are described, along with associated penalties, in* "*Standard Penalties and Fees for Program Non-Conformance.*" By signing the MOA the Producer is agreeing to the terms as delineated in the "Standard Penalties and Fees for Program Non-Conformance."

4. TGC-Producers seeking first-time entry into the NTGCICP should evaluate their facility and operations, and acquire appropriate approvals, prior to any expectation of USFWS consideration as a cooperating TGC Producer in the NTGCICP. Prospective cooperating TGC Producers must document that their business is familiar with the biological safeguards required for an aquaculture facility in their State, that they have a State approval/permit to conduct such a business, and that they have read and understand the standards of the NTGCICP. A written request by the prospective cooperating TGC-Producer, to participate in NTGCICP, should be submitted to their respective USFWS Regional Office (Fisheries Division) for consideration. Following initial approval by the Region, a subsequent Facility and Management Inspection will ensue by a USFWS inspector and a representative from the Warm Springs Regional Fisheries Center, in GA (the National Coordination Office for NTGCICP). Should the producer and facilities "pass" such an inspection, a provisional MOA between USFWS and the TGC-Producer would be initiated under signature of both parties -- -- to be provisional and expire in one year. After the trial/provisional year, the MOA could be extended for three years, via approval and signature of the Regional Office, ARD-Fisheries. However, if non-conformance to NTGCICP standards were observed by Inspectors during the provisional time period, the privilege of NTGCICP continuance under a subsequent three-year MOA would be forfeited.

5. Inspections and Certifications at TGC-Producer site will be immediately terminated in the event a TGC-Producer were convicted of a Lacey Act **Felony** Violation in the course of doing Grass Carp business. Such a violation would constitute an action deemed contrary to the framework of the NTGCICP, and an action that is contrary to expectations for cooperating private TGC producers. Accordingly, the consequences of a Lacey Act Felony Conviction would constitute permanent loss of privileges to USFWS Inspections and Certifications under a MOA. {Due to the complexity of Lacey Act infractions at differing degrees of Misdemeanors, any subsequent MOA penalty imposed for a Lacey Act Misdemeanor violation will require additional review by USFWS Law Enforcement.}

6. The cooperating TGC-Producer understands that the USFWS must ensure scientific integrity of the NTGCICP as its primary role in the Program. The cooperating TGC-Producer also recognizes that while participation in NTGCICP is voluntary, the partnership is a privilege and not a right. In this regard, the loss of NTGCICP privileges for a Cooperating TGC-Producer might result in economic impacts (potential loss of business opportunity). Accordingly, should actions by the TGC-Producer result in cessation of the MOA, the USFWS would be held harmless for any damage or loss, including potential associated revenues (viz., unrealized future triploid grass carp profits).

IV. Costs Associated with MOA

Costs associated with implementing and administrating the NTGCICP will be addressed on a periodic basis (at Business Meetings) and reconciled with TGC Producers, along with the national Standards for TGC-Producers and TGC-Inspectors. Costs and expenditures for NTGCICP will be managed in a way that achieves approximate break-even status. Derived revenue will be placed into a dedicated TGC-Account for administration of the NTGCICP, including costs for quality assurance. {Funds received through non-conformance fees will be used for inter-regional quality assurance, and for adjudication protocols and procedures.}

V. Termination of MOA

The MOA will continue through the duration of its term (up to three years), unless reasonable cause requires earlier termination by USFWS or TGC-Producer. Written notice of at least 30-days will precede any termination action, other than Termination due to Non-compliance.

VI. No Warranty.

USFWS makes no express or implied warranty as to the conditions of inspection, or any data developed under this agreement. The Government shall not be liable for special, consequential, or incidental damages attributed to inspection performed under this Agreement. These provisions shall survive termination of the Agreement.

VII. Hold Harmless

To the extent permitted by law, Cooperating TGC-Producer holds the U.S. Government harmless and indemnifies the Government for all liabilities, demands, damage, expenses, or losses arising out of the use by Cooperating TGC-Producer, or any party acting on its behalf or under its authorization, of USFWS services under this Agreement. Notwithstanding the foregoing, Cooperating TGC-Producer agrees to assume liability only for the consequences of its own negligence.

VIII. Force Majeure.

Neither party shall be liable for any unforeseeable event beyond its reasonable control which is not caused by the fault or negligence of the non-performing party and which causes a party to be unable to perform its obligations under the Agreement. Examples of such force include but are not limited to Acts of God, acts or omissions of any government or agency, domestic or international, compliance with requirements, rules, regulations, or orders of any government authority or any office department, agency or instrumentality thereof; fire, storm, flood, insurrection, accident, sabotage, riot, war, quarantine, terrorist act or institutional failure outside the control of the Parties.

IX. Miscellaneous.

1. Entire Agreement. This Agreement and any attachments constitute the entire agreement between the parties concerning the subject matter hereto and supersede any prior understanding or written or oral agreement relative to this matter between the parties themselves or with anyone performing work as a result of this agreement.

2. Independent Contractors. The relationship of the parties to this Agreement is that of independent contractors and not as agents of each other or as joint ventures or partners. Neither party is authorized or empowered to act on behalf of the other with regard to any contract, warranty, or representation; and neither party will be bound by the acts or conduct of the other. Each party will maintain sole and exclusive control over its own personnel and operations.

3. No Benefits. No member of or delegate to the US Congress, or resident commissioner, shall be entitled to any benefit that may arise from this Agreement.

4. Amendments. If either party desires a modification in this Agreement, the parties shall upon reasonable notification of the proposed modification by the party desiring the change, discuss the request, and in the event that it is agreed to; the amendment must be reduced to writing and signed by the parties.

5. Assignment. Neither this Agreement nor any rights or obligations of any party hereunder shall be assigned or otherwise transferred without the prior written consent of the other party.

6. Use of Name or Endorsements. (a) Cooperating TGC-Producer shall not use the name or proprietary marks of USFWS or the Department of the Interior for purposes not covered under the National Triploid Grass Carp Inspection and Certification Program. (b) By entering this Agreement the Government does not directly or indirectly endorse any specific business enterprise, nor its successors, assignees or licensees.

7. Notices. During the term of this Agreement any notices required by the terms will be sent by first class mail to the signatory identified on page six (6) of this agreement, who in turn, will be responsible for any subsequent response and/or action pertinent to the official notice.

8. Severability. Should any portion of this Agreement subsequently be determined to be invalid, illegal, or unenforceable, the said provision shall at that time be deemed severed from this Agreement, but only as to the specific extent of its invalidity, illegality or unenforceability, and such reformed provision as well as all other provisions of the Agreement shall be unaffected and shall continue in full force and effect.

9. Governing Law. United States Federal law shall govern this Agreement.

X. Signatories to MOA

Triploid Grass Carp Producer

I am _____ , the owner(s) of the TGC-Production facility, by the name of _____ _____, located in _____.

I have read each of the six tenets of the Memorandum of Agreement (MOA) and the aligned five National Standards for the NTGCICP, and I attest to this Agreement by **my signature** :

(Day) (Month) (Year)

_____ _____

_____ _____

US Fish and Wildlife Service

	Yes	No	Initials
State-Authorizations Verified by USFWS Region	☐	☐	_____
Inspections Verified Alignment with NTGCICP (Regional approval)	☐	☐	_____
Inspections Verified Alignment with NTGCICP (WSRFC approval)	☐	☐	_____

USFWS recognizes above named TGC-Producer(s) as Cooperating Partner in the NTGCICP, under a Provisional ☐, or a Standard ☐ MOA that expires on _____ _____ _____

_____ _____

Regional Director, U.S. Fish & wildlife Service **Date**

J.M. Malone & Sons

Spawning/Triploid Induction

1) All activities concerning broodstock and the hatchery facility will be supervised by a manager.
2) Diploid grass carp identified during farm level ploidy testing are stocked into earthen production ponds which are managed to grow aquatic vegetation for the purposes of feeding the grass carp. The standpipe of each pond is screened to prevent the escape of any fish.
3) In the spring of the year, diploid grass carp no less than 3 years of age are gathered from the production ponds and stocked into small 1 or 2 acre holding ponds under the supervision of a farm manager. The standpipe of each pond is screened to prevent the escape of any fish.
4) The holding ponds are fed daily with fresh cut green grass.
5) During the months of May, June and July groups of diploid grass carp are brought to the grass carp hatchery for spawning.
6) Under the supervision of a farm manager, a holding pond is seined with a ½ inch mesh net and the diploid grass carp broodstock are tranquilized with Quinaldine sulfate.
7) The hatchery manager selects four to eight males and females based on secondary sexually characteristics. The selected males and females are placed into separate hauling tanks for transport to the hatchery.
8) Once the diploid grass carp broodstock arrive at the hatchery, they are tranquilized using quinaldine sulfate and hand carried into the hatchery under the supervision of the hatchery manager. Each fish is individually weighed and tagged before placed into the broodstock holding tank. Females and males are held at separate ends of the broodstock holding vat separated by a divide placed in the middle of the broodstock holding tank and held in place with weights.
9) The broodstock holding tank is supplied with airstones for aeration and heated, filtered well water to maintain the water temperature between 76 and 80 degrees Fahrenheit.
10) The covers of the broodstock holding vat containing the diploid grass carp broodstock will be in the lowered position at all times except when the tank is being cleaned daily and when the broodstock are receiving injections or are being spawned. At such times the covers will be raised using the hand crank on the wall.
11) The floor drains in the aisle next to the broodstock holding tank are covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall while being handled. The drain pipe on the downstream end of the broodstock holding tank is screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the broodstock holding vat will remain in place at all times except when the tank is being cleaned daily, the tank is being flushed to remove tranquilizer or the tank is being dewatered for disinfection. Prior to removing the

drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or discarded in the mort bucket. Prior to removing the drainpipe to de water the broodstock holding tank, any fish remaining in the holding vat will be removed and transported to the diploid holding tanks in the testing lab or discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.

12) During the placement of broodstock grass carp in the broodstock holding tank, the diploid grass carp broodstock are given an injection of HCG to begin the process of egg maturation and induced spawning. Approximately 24 hours after the first injection the diploid grass carp broodstock are given a second injection of HCG to continue the process of egg maturation and induced spawning. Approximately 24 to 36 hours after the second injection the diploid grass carp broodstock are given a third injection containing carp pituitary to finish the process of egg maturation and induced spawning.
13) Eight hours following the last injection the diploid grass carp broodstock are tranquilized and the females are individually checked for readiness to spawn. If the females are not ready to spawn the holding tank is flushed with fresh water and left alone for one hour before the fish are tranquilized and checked again for readiness to spawn. Once the females have reached the proper state of readiness, spawning can begin. The spawning and triploid induction process is done on an individual female basis. Only one female is spawned at a time. Eggs from multiple females are not mixed. The spawning and triploid induction process for a given female is completed before another female is spawned.
    a) Once a female is ready to spawn, a cloth bag is placed over the females head and the fish is lifted from the water. The fish is dried with paper towels and the eggs are hand stripped into a large, dry plastic bowl. Following spawning, the female is returned to the broodstock holding tank and the bowl of eggs is covered and placed onto a bench in the hatchery.
    b) A male is selected and a cloth bag is placed over its head and the fish is lifted from the water. The fish is dried with paper towels and the milt is hand stripped into a glass measuring cup. Milt from two males is collected into the same measuring cup. Following stripping the males are returned to the broodstock holding tank and the measuring cup containing the milt is covered and placed on a bench in the hatchery.
    c) The eggs are then measured equally into two to five large, dry plastic bowls and placed on the bench. The milt is measured equally into each of the bowls containing eggs.
    d) Each bowl of eggs is individually fertilized, water hardened and treated to induce triploidy on an individual basis. Only one bowl of eggs is fertilized, water hardened and treated to induce triploidy at a time. The fertilization, water hardening and triploid induction process is completed for a given bowl before another bowl can be fertilized.
    e) The milt is mixed with the eggs in a given bowl and is activated by adding a measured volume of tempered water to the bowl. Two stop watches are started

the instant the water is added to the bowl. Additional measured volumes of tempered water are added to the bowl at preset intervals.

f) At the appropriate time interval post fertilization, the excess water is poured off of the fertilized eggs into an empty bucket and the fertilized eggs are poured into the triploid induction apparatus.
g) The eggs remain in the triploid induction apparatus for a preset time interval and then they are poured into numbered incubation tanks.
h) Each incubation tank holds treated, fertilized eggs from a given bowl. Groups of treated, fertilized eggs are not mixed in incubators. Every bowl of eggs is placed into a separate incubator following fertilization and triploid induction.

Incubation/Fry Ploidy Testing

1) Incubation occurs in 65 gallon fiberglass conical bottom tanks. Filtered, heated well water is supplied to each incubation tank through an overhead de gassing and distribution tank. Water is introduced to the bottom of the incubation tank through a pipe with holes cut around its circumference to allow for equal distribution of flow. The water flows from the bottom of the tank in an upward direction gently rolling the treated, fertilized eggs concentrated in the conical bottom of the tank.
2) Each incubation tank has two drains through the side of the tank near the top. Each drain is screened modular "filters" which are covered in saran cloth having openings of less than 350 microns. Water flowing out of the incubation tanks through the modular filters travels down plastic hoses into a pvc drain pipe which flows into a floor drain. The end of the pvc drain pipe is fitted with a filter bag.
3) Each incubation tank also has a bottom drain which is plugged with a wooden dowel from inside the tank. A hose is attached to the outside of the bottom drain and extends to the top of the incubation tank and is held in place with plastic cable ties to prevent it from falling over.
4) Treated, fertilized eggs are incubated in the upwelling current of the incubation tanks for 24 hours before they begin to hatch. Incubation tanks are treated twice daily with formalin to prevent fungus.
5) Once hatching has begun, an air line is introduced to the bottom of the incubation tank and air is used to circulate the hatching eggs and newly hatched embryos in an upwelling current. Newly hatched grass carp are semi buoyant and would settle to the bottom of the incubation tanks and suffocate if the upwelling current created by the air flow was not present.
6) During the incubation process the modular screens are checked no less than every 2 hours to ensure they are not clogged with eggs shells or fungus which would cause the incubation tanks to overflow. If a modular screen begins to clog it is either turned, scrubbed or replaced with a new, clean modular screen. If the modular screen is replaced it is done in a manner to prevent any escape of eggs are fry.
7) Three days post hatch a sample of fry is taken from each incubation tank and tested in two replicates for each incubation tank using a flow cytometer. Groups of fry from different incubators are not mixed for ploidy testing.
8) The results of the flow cytometry indicate the approximate percentage of triploid fry in each incubation tank. Incubation tanks containing lots of fry comprised of less than 99% triploids are destroyed with bleach under the supervision of a farm manager. Incubation tanks containing lots of fry comprised of greater than 99% triploids are stocked into nursery ponds four days post hatch under the supervision of a farm manager.

Stocking/Nursery

1) Incubation tanks containing groups of high ploidy grass carp fry to be stocked are drained under the supervision of a farm manager to a volume of approximately 10 gallons using a siphon hose drawing water through a saran screen.
2) The wooden dowel plug at the bottom of the incubation tank is removed and the hose attached to the outside of the bottom drain is cut loose from the cable tie which is holding it in place at the top of the incubation tank.
3) As the hose is lowered from its position a farm manager plugs the end of the hose with a finger. The fry and water remaining in the incubation tank is drained through the hose into multiple plastic bags. Once the incubation tank is empty the plastic bags containing the fry are filled with air and sealed with rubber bands.
4) The bags containing the lots of high ploidy grass carp fry are then transported to prepared nursery ponds in the bed of a truck under the supervision of a farm manager. The nursery ponds had been dried several weeks prior and refilled with well water within one week of stocking. The standpipe on the nursery ponds is elevated above the top of the levee and tied in position.
5) The bags containing the lots of high ploidy grass carp fry are then tempered at the water's edge and the fry are released into the nursery pond under the supervision of a farm manager.
6) Each nursery pond will receive fry from an individual female. Fry from multiple females are not mixed in nursery ponds. Fry from multiple incubation tanks from the same female may be mixed in nursery ponds if the ploidy of each incubation tank is similar.
7) The high ploidy grass carp fry remain in the nursery ponds for 1 to 12 months.
8) At two weeks post stocking fingerlings from each nursery ponds are sampled individually using a coulter counter to determine the ploidy of each nursery pond. Nursery ponds containing lots of grass carp fingerlings comprised of less than 98% triploids are destroyed under the supervision of a farm manager.
9) All activities within the nursery ponds and hatchery will be supervised by a manager.

Fingerling Harvest

1) Beginning 1 to 2 months post stocking nursery ponds are harvested using an 1/8 inch mesh seine under the supervision of a farm manager.
2) Untested high ploidy groups of fingerlings are netted from the seine and transported to hauling tanks in five gallon buckets.
3) The transport tanks carry the untested high ploidy fingerlings to the holding facility and where they are piped into a holding tank.
4) The covers of the holding vat containing the untested high ploidy lots of grass carp fingerlings will be in the lowered position at all times except when the tank is being cleaned daily and when the fingerlings are being handled. At such times the covers will be raised using the hand crank on the wall.
5) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tanks will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place at all times except when the tank is being cleaned daily or the tank is being dewatered for disinfection. Prior to removing the drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or discarded in the mort bucket. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
6) All activities within the nursery ponds and holding facility will be supervised by a manager.

Fingerling Stocking

1) After 1 to 2 days of purging the groups of untested high ploidy fingerlings are sampled by blood testing 120 to 300 individual fish by means of a coulter counter. The sampling determines the average ploidy of each group and identifies size gradients within each group which could be graded from the group to improve the ploidy of the group.
2) If the ploidy of a group is less than 99% or cannot be graded up to 99% the group of fingerlings is destroyed under the supervision of a farm manager.
3) If necessary the group is graded to improve the ploidy or to reduce size variation.
4) One day following grading the group of high ploidy untested fingerlings is loaded into hauling tanks and transported to growout ponds under the supervision of a farm manager. Each group is counted and weighed so that the appropriate number of fingerlings is stocked into each pond.
10) The growout ponds have been previously drained, dried, disked and refilled using either well water or filtered pond water from an adjacent growout pond. The standpipe on the growout ponds is elevated above the top of the levee and tied in position.
5) The fingerlings in the hauling tanks are tempered on the levee by exchanging water from the growout pond being stocked with the water in the hauling tanks.
6) Once tempering is complete the fingerlings are piped into the growout ponds under the supervision of a farm manager.

Marketable Fish Harvest

1) Beginning 2 to 3 months post stocking groups of marketable size untested high ploidy grass carp are ready for harvest.
2) Under the supervision of a farm manager, bait is placed in the corner of a growout pond and a ¾ inch seine is used to catch marketable size untested high ploidy grass carp for a specific order.
3) The fish are tranquilized using quinaldine sulfate and transported to hauling tanks in 20 gallon plastic tubs.
4) The fish are placed into the hauling tanks and transported to the holding facility.
5) The transport tanks carry the untested high ploidy grass carp to the holding facility where they are piped into a holding tank.

Holding lots of untested high ploidy marketable grass carp

1) The covers of the holding vat containing the untested high ploidy lots of grass carp will be in the lowered position at all times except when the tank is being cleaned daily and when the fish are being handled. At such times the covers will be raised using the hand crank on the wall.
2) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tanks will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place at all times except when the tank is being cleaned daily or the tank is being dewatered for disinfection. Prior to removing the drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or discarded in the mort bucket. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
3) All effluents from the holding facility will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
4) No untested high ploidy group of grass carp will be held in a holding tank adjacent to any holding tank containing 100% producer tested triploid grass carp or 100% certified triploid grass carp.
5) Any grass carp found on the floor of the holding facility shall be discarded in the mort bucket. No grass carp found on the floor of the holding facility is to be returned to any holding vat.
6) All holding vats containing groups of untested high ploidy grass carp or tested or certified grass carp shall be clearly marked as such.
7) All holding vats containing groups of untested high ploidy grass carp or tested or certified grass carp shall be 100 feet from the nearest pond containing untested grass carp and shall be housed in a manner to prevent the movement o f untested fish by animals.
8) All activities within the holding facility will be supervised by a manager.

Moving lots of untested high ploidy marketable grass carp to the testing lab

1) The covers of the holding vat containing the untested high ploidy lots of grass carp to be tested will be raised using the hand crank on the wall.
2) The untested grass carp in the holding tank will be tranquilized using quinaldine sulfate
3) The untested grass carp will be seined to the downstream end of their holding tank at a speed sufficient to prevent spooking the fish causing them to jump out of the holding tank.
4) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tank will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place during the movement of the untested fish. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and transported to the testing lab or discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
5) All effluents from the holding facility and blood testing lab will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
6) The untested grass carp will either be dip netted or hand counted into the crane transport container which will contain enough water to prevent stressing the fish during transport.
7) The overhead crane will carry the crane transport container to the testing lab. The fish will be piped from the crane transport container into lab holding vat C. The crane transport tank shall be operated a safe distance from any holding vat containing tested or certified triploid grass carp sufficient to prevent any fish from jumping out of the crane transport tank and into a holding vat containing triploid or certified grass carp. Any fish which jumps out of the crane transport tank or is found on the holding shed floor shall be discarded in the mort bucket.
8) The covers of the lab holding vat C containing the untested high ploidy lots of grass carp to be tested will be in the lowered position at all times except when the tank is being cleaned daily and when the untested fish are being tested. At such times the covers will be raised using the hand crank on the wall.
9) The floor drains in the aisle between holding tanks in the lab will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tanks in the lab will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place at all times except when the tank is being cleaned daily or the tank is being dewatered for disinfection. Prior to removing the drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or

discarded in the mort bucket. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and transported to the diploid holding tanks in the testing lab or discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.

Farm Level Triploid Testing Prior To USFWS Inspection

1) The covers of lab holding vat C containing the untested high ploidy lots of grass carp to be tested will be raised using the hand crank on the wall.
2) Untested high ploidy lots of grass carp being held in lab vat C will be tranquilized using quinaldine sulfate.
3) The untested grass carp will be seined to the downstream end of their lab holding vat C at a speed sufficient to prevent spooking the fish causing them to jump out of the holding tank.
4) The floor drains in the aisle between holding tanks in the lab will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tanks in the lab will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place at all times except when the tank is being cleaned daily or the tank is being dewatered for disinfection. Prior to removing the drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or discarded in the mort bucket. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and transported to the diploid holding tanks in the testing lab or discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
5) All effluents from the blood testing lab will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
6) The tranquilized lot of untested high ploidy grass carp will be sized by hand using measuring boards. The fish shall be classified as 8 inch minimum, 10 inch minimum and 12 inch minimum. Each fish will be measured, classified and segregated into a division of lab holding vat C.
7) When a segregated size class of untested high ploidy grass carp is to be tested the group is tranquilized using quinaldine sulfate and crowded in a seine.
8) The tranquilized untested high ploidy grass carp are then dip netted or hand counted into a holding pan containing water with quinaldine sulfate housed on a cart with wheels. There are a maximum of three carts in operation at any given time.
9) The carts holding the pans of tranquilized untested high ploidy grass carp are placed next to the pokers at blood sampling station.
10) The poker then picks up individual fish and uses a hypodermic needle mounted into the end of a glass test tube to poke the fish in the isthmus until a bead of blood is drawn. Experienced pokers can accomplish this with one poke.
11) Once a bead of blood is drawn the poker extends their arm slightly towards the pipetter.

12) The pipetter uses a pipette to draw approximately 1ul of blood. The blood sample is then expelled into an accuvettes containing 10 ml of isoton solution with zapoglobin.
13) The accuvette containing the blood sample is placed into a color coded, number coded tray.
14) The fish is placed into a corresponding color coded, number coded floating net.
15) Once all of the spaces on the tray and corresponding floating net are full, the tray is handed to the coulter counter operator.
16) Each accuvette containing a blood sample from an individual fish is placed into the coulter counter and is analyzed. The coulter counter measures the diameter of the red blood cells. The operator ensures that the histogram displayed on the coulter counter has cleared between samples. Once the new histogram for the new sample is displayed the coulter counter operator makes the determination as to whether the sample produces a triploid reading, a diploid reading or an undetermined reading.
17) If the sample is determined to produce a triploid reading the accuvette is removed from the coulter counter and discarded.
18) If the sample is determined to produce a diploid reading, an accuvette containing red liquid is placed in the numbered corresponding location on the tray from which the sample came from. The accuvettes containing the sample is then discarded.
19) If the sample is determined to produce an undetermined reading, the coulter counter operator requests a new sample be taken from the corresponding fish. A lab employee retrieves the fish from the corresponding color coded, number coded floating frame and brings it to a poker. The poker pokes the fish in the isthmus and the pipetter draws a blood sample and expels it into an accuvette containing 10 ml of isoton with zapoglobin. The lab employee who retrieved the suspect fish carries both the fish and the accuvettes containing the new sample to the coulter counter operator. The coulter counter operator then analyzes the new sample. If the sample is determined to produce a triploid reading the fish is returned to its floating net. If the sample is determined to produce a diploid or undetermined reading the fish is placed into lab holding vat A or B.
20) Once all samples on a color coded, number coded tray have been analyzed, a lab employee carries the tray to the end of the lab floating tank. All lab employees stop their assigned tasks and watch the lab employee carrying the tray. The lab employee with the tray then verbally calls out the color and number of each red accuvette on the tray. As the lab employee calls out the location of the red accuvettes, the lab employee removes the corresponding fish from the floating net and places it into lab holding vat A or B. Once all fish corresponding to red accuvettes on the tray have been removed from the tray, the fish remaining on the corresponding floating net are placed into the temporary triploid isolation tank. In the event there are no red accuvettes on a tray, the lab employee verbally calls out the color of the tray followed by the phase “is good”. All lab employees then stop their assigned tasks and watch the lab employee carrying the tray as the lab employee places all of the fish on the corresponding floating net into the temporary triploid isolation tank.
21) Once all untested high ploidy fish from a segregated size class have been individually tested and all fish whose blood samples produced a diploid or undetermined result have been removed

from the lot, a sub sample of 120 fish is taken from the temporary triploid isolation tank. Each of the 120 fish is then individually retested using the same protocol. If all samples from each of the 120 fish produce a triploid reading, all fish in the temporary triploid isolation tank may be transported using the crane to a 100% producer tested holding vat. If any of the samples from each of the 120 fish produce a diploid or undetermined reading, all fish in the temporary triploid isolation tank must be placed back into holding vat C and individually retested using the same protocol.

22) Holding vats containing 100% producer tested fish must be 6 feet from any vat containing diploid or untested grass carp and must display a sign which indicates the vat contains 100% producer tested fish.
23) All activities in the blood testing lab and the holding facility will be supervised by a manager and will be recorded on closed circuit television cameras.

Isolation of 100% Producer Tested Grass Carp

1) The covers of the holding vat containing the 100% producer tested lots of grass carp will be in the lowered position at all times except when the tank is being cleaned daily and when the fish are being handled. At such times the covers will be raised using the hand crank on the wall.
2) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled.
3) The drain pipe on the downstream end of the holding tanks will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place at all times except when the tank is being cleaned daily or the tank is being dewatered for disinfection. Prior to removing the drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or discarded in the mort bucket. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
4) All effluents from the holding facility will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
5) No groups of 100% producer tested grass carp will be held in a holding tank adjacent to any holding tank containing untested or diploid groups of grass carp.
6) Any grass carp found on the floor of the holding facility shall be discarded in the mort bucket. No grass carp found on the floor of the holding facility is to be returned to any holding vat.
7) All holding vats containing groups of 100% producer tested grass carp shall be clearly marked as such.
8) All holding vats containing groups of 100% producer tested grass carp shall be 100 feet from the nearest pond containing untested grass carp and shall be housed in a manner to prevent the movement of untested fish by animals.
9) All activities in the holding facility will be supervised by a manager and will be recorded on closed circuit television cameras.

Triploid Inspection and Certification

1) The lab manager maintains contact with the USFWS triploid grass cap inspector. It is understood that the USFWS inspector is available to conduct inspections on Monday, Wednesday and Friday.
2) When an inspection is needed the lab manager arranges a time with the inspector.
3) Prior to the arranged inspection, the lab manager completes the pre inspection portion of the USFWS Checklist for Triploid Grass Carp inspections and ensures all requirements have been met.
4) Upon arrival at the farm the inspector is presented with the checklist which contains the location and quantity of 100% producer tested lots to be inspected.
5) The inspector indicates how many fish are to be randomly collected from each tank and supervises the collection of the random sample by the lab employees.
6) The inspector then supervises the collection and channelization of blood samples from known diploid grass carp and records the results on the checklist. 2.8 um Beads may be substituted.
7) The inspector then supervises the collection and channelization of individual blood samples from the random sample of 100% producer tested grass carp according to the standards of the USFWS Triploid Grass Carp Ploidy Inspection Program.
8) If all of the randomly sampled fish tested under the supervision of the USFWS inspector are shown to be triploid, the inspection is passed and certificates may be issued.
9) If even one diploid is found among the randomly sampled fish tested under the supervision of the USFWS inspector, the inspection is failed and no certificates may be issued. Every fish in the lots being inspected must be individually retested by the producer before another inspection can be scheduled.
10) Once a lot has passed USFWS inspection the USFWS will issue certificates of inspection indicating that the lot met the requirements of the USFWS inspection and certification program.
11) The inspector will complete the certificate with information provided by the producer. The inspector will sign and emboss the original certificate indicating the lot met the requirements. The producer will sign the original certificate authorizing the inspector to release the certificate to the receiving State. Photocopies of the original certificate will be made. The original will accompany the shipment, one copy will be maintained by the producer and one copy will be maintained by the inspector and faxed to the receiving State.
12) A copy of the checklist will be made. The original will be maintained by the producer, one copy will be maintained by the inspector.
13) See USFWS Standards regarding changes to certificates and expiration of certificates.
14) All activities in the holding facility and blood testing lab will be supervised by a manager and will be recorded on closed circuit television cameras.

Isolation of 100% Certified Triploid Grass Carp

1) The covers of the holding vat containing the 100% certified lots of grass carp will be in the lowered position at all times except when the tank is being cleaned daily and when the fish are being handled. At such times the covers will be raised using the hand crank on the wall.
2) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled.
3) The drain pipe on the downstream end of the holding tanks will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place at all times except when the tank is being cleaned daily or the tank is being dewatered for disinfection. Prior to removing the drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or discarded in the mort bucket. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
4) All effluents from the holding facility and blood testing lab will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
5) No groups of 100% certified grass carp will be held in a holding tank adjacent to any holding tank containing untested or diploid groups of grass carp.
6) Any grass carp found on the floor of the holding facility shall be discarded in the mort bucket. No grass carp found on the floor of the holding facility is to be returned to any holding vat.
7) All holding vats containing groups of 100% certified grass carp shall be clearly marked as such.
8) All holding vats containing groups of 100% certified grass carp shall be 100 feet from the nearest pond containing untested grass carp and shall be housed in a manner to prevent the movement of untested fish by animals.
9) All activities in the holding facility will be supervised by a manager and will be recorded on closed circuit television cameras.

100% Certified Triploid Grass Carp Sale

1) The covers of the holding vat containing the certified lots of grass carp to be sold will be raised using the hand crank on the wall.
2) The certified grass carp in the holding tank will be tranquilized using quinaldine sulfate
3) The certified grass carp will be seined to the downstream end of their holding tank at a speed sufficient to prevent spooking the fish causing them to jump out of the holding tank.
4) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tank will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place during the movement of the untested fish. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and transported to the testing lab or discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
5) All effluents from the holding facility and blood testing lab will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
6) The certified grass carp will be dip netted or hand counted into tubs or the crane transport container which will contain enough water to prevent stressing the fish during transport.
7) The overhead crane will carry the crane transport container to the hauling truck. The fish will be piped from the crane transport container into the hauling truck. The crane transport tank shall be operated a safe distance from any holding vat containing tested or certified triploid grass carp sufficient to prevent any fish from jumping out of the crane transport tank and into a holding vat containing triploid or certified grass carp. Any fish which jumps out of the crane transport tank or is found on the holding shed floor shall be discarded in the mort bucket.
8) The tubs will be hand carried to the hauling truck and poured into the hauling truck. The tubs shall be carried a safe distance from any holding vat containing tested or certified triploid grass carp sufficient to prevent any fish from jumping out of the tub and into a holding vat containing triploid or certified grass carp. Any fish which jumps out of the tub or is found on the holding shed floor shall be discarded in the mort bucket.
9) Every customer purchasing 100% certified triploid grass carp which is required by the receiving State to maintain any permit for grass carp must provide a copy of their permit to the sales office prior to purchasing triploid grass carp.
10) Every customer is provided with an invoice which indicates the quantity, size, cost of the triploid grass carp purchased as well as the State for which the triploid grass carp certificate was issued.
11) Every customer is provided with the original embossed triploid grass carp certificate.

12) All activities in the holding facility and sales office will be supervised by a manager and will be recorded on closed circuit television cameras.
13) All records regarding sale of certified triploid grass carp will be kept for a period of 7 years
14) No sale will be finalized if the permit/paperwork/customer is suspect. We reserve to right not to sell fish to anyone.

Diploid (Untested) Grass Carp Sale

1) Holding tanks containing diploid or untested grass carp must be marked as such.
2) Holding tanks containing diploid or untested grass carp must be 6 feet from any tank containing tested or certified triploid grass carp.
3) The covers of the holding vat containing either untested lots of high ploidy grass carp or diploid grass carp to be sold will be raised using the hand crank on the wall. Whenever possible untested lots of high ploidy grass carp will be sold as diploids.
4) The grass carp in the holding tank will be tranquilized using quinaldine sulfate
5) The grass carp will be seined to the downstream end of their holding tank at a speed sufficient to prevent spooking the fish causing them to jump out of the holding tank.
6) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tank will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place during the movement of the untested fish. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and transported to the testing lab or discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
7) All effluents from the holding facility and blood testing lab will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
8) The grass carp will be dip netted or hand counted into tubs or the crane transport container which will contain enough water to prevent stressing the fish during transport.
9) The overhead crane will carry the crane transport container to the hauling truck. The fish will be piped from the crane transport container into the hauling truck. The crane transport tank shall be operated a safe distance from any holding vat containing tested or certified triploid grass carp sufficient to prevent any fish from jumping out of the crane transport tank and into a holding vat containing tested or certified triploid grass carp. Any fish which jumps out of the crane transport tank or is found on the holding shed floor shall be discarded in the mort bucket.
10) The tubs will be hand carried to the hauling truck and poured into the hauling truck. The tubs shall be carried a safe distance from any holding vat containing tested or certified triploid grass carp sufficient to prevent any fish from jumping out of the tub and into a holding vat containing tested or certified triploid grass carp. Any fish which jumps out of the tub or is found on the holding shed floor shall be discarded in the mort bucket.
11) Every customer purchasing diploid grass carp which is required by the receiving State to maintain any permit for grass carp must provide a copy of their permit to the sales office prior to purchasing triploid grass carp.

12) Every customer is provided with an invoice which indicates the quantity, size, cost of the grass carp purchased.
13) All activities in the holding facility and sales office will be supervised by a manager and will be recorded on closed circuit television cameras.
14) All records regarding sale of diploid (untested) grass carp will be kept for a period of 7 years
15) No sale will be finalized if the permit/paperwork/customer is suspect. We reserve to right not to sell fish to anyone.

Arkansas

CIRCULAR 21
ISSUED: March, 2007
REVISED: December, 2010

REGULATIONS ON AQUACULTURE IN ARKANSAS

This circular is issued in March, 2007, by the **Arkansas State Plant Board**. Other regulations issued by the Plant Board are covered in other circulars. Address correspondence to State Plant Board, P.O. Box 1069, Little Rock, AR 72203.

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Approved and Issued by:

ARKANSAS STATE PLANT BOARD

Under Authority of:
Commercial Bait and Ornamental Fish Act (A.C.A. 2-5-201)

SECTION I. Official Standards for the Certification of Commercial Bait and Ornamental Fish in Arkansas

A. Purpose

To provide high quality, farm-raised bait and ornamental fish, free of certain diseases, undesirable plants, undesirable animals, and other contaminates deemed injurious to fish or fisheries.

B. Authority

The Arkansas State Plant Board, a division of the Arkansas Agriculture Department, under act 1449 of 2005, is the official certifying agent.

C. Certified Pathogens and Aquatic Nuisance Species (ANS)

Within the detection limits of the appropriate official testing protocol, commercial bait and ornamental fish meeting these standards are certified free of the pathogens, plants, animals and other contaminates listed here:

a. Spring Viremia of Carp (SVCV)
b. Infectious Pancreatic Necrosis (IPNV)
c. Viral Hemorrhagic Septicemia (VHSV)
d. Infectious Hematopoietec Necrosis (IHNV)
e. Eurasian watermilfoil (*Myriophyllum spicatum*)
f. Giant Salvinia (*Salvinia molesta*)
g. Hydrilla (*Hydrilla verticillata*)
h. Zebra mussel (*Dreissena polymorpha*)
i. New Zealand mud snails (*Potamopyrgus antipodarum*)
j. Red-rimmed melania (*Melanoides tuberculata*)
k. Sticklebacks (Family Gasterosteidae)
l. Rudd (*Scardinius erythrophthalmus*)
m. Orfe (*Leuciscus idus*)
n. Silver carp (*Hypophthalmichthys molitrix)*
o. Bighead carp (*Hypophthalmichthys nobilis)*
p. Snakehead fish *(*Family *channidae)*
q. Quagga Mussel *(Dreissena rostriformis bugensis)*

D. Controlled Species

Commercial bait and ornamental fish meeting program standards are certified to be

produced using Arkansas Plant Board approved best management practices that reduce the likelihood that the following species will be present in any shipment of certified fish.

a. Mosquito fish (*Gambusia spp*.)

E. Definitions

APHIS: Acronym for the U.S. Department of Agriculture, Animal and Plant Health Inspection Service.
Certified Producer: A Fish Farmer approved under these standards to represent their fish as *Arkansas Certified*.
Fishery: A region of water used for commercial and/or sport fishing.
Fish Farm: A location and/or business entity established for the commercial culture of fish, under the continuous management of a fish farmer.
Fish Farmer: For the purpose of these standards, the holder of a valid *Fish Farmer (aquaculturist) Permit* issued by the Arkansas Game and Fish Commission.

F. Eligibility Requirements

To be designated as *Arkansas Certified*, bait and ornamental fish must:

a. have been spawned, hatched, and reared in Arkansas on a fish farm,
b. have been raised in accordance with the practices and procedures defined in these standards,
c. have met all inspection and testing requirements defined in these standards,
d. and, be accompanied by a valid Arkansas Agriculture Department certificate.

G. Fees

i. The annual fee to the Plant Board for Certification shall be one dollar per surface acre of all ponds used to produce certified fish.
ii. The fee to the Plant Board for additional ANS inspections required for farms failing annual inspections shall be one dollar per pond surface acre.

Note: Fees for veterinary supervision of disease sample collection and lab fees for disease testing are not included in the Plant Board fees and must be negotiated between the farm and the service providers.

H. Application for Participation

Farmers wishing to have their fish certified under these guidelines must make application on official Plant Board forms.

I. Cultural Practices and Business Procedures

As part of the application process, farmers (the individual holding the Arkansas Game and Fish Commission *Fish Farmer Permit*) must sign an affidavit agreeing to strictly adhere to the following cultural practices and business procedures:

a. Will culture only those species listed on the Arkansas Game and Fish Commission *Approved Aquaculture Species List* or by Arkansas Game and Fish Commission permit. .
b. Use only water from wells or recycled water from within the farm proper without mixture with outside waters or contact with non-certified fish. Surface waters from any uncertified area of the farm may not be recycled to any certified area of the farm.
c. No fish will be stocked into any pond used for the production of certified fish unless they come from a source certified under these guidelines. In special circumstances, such as the availability of new species or breeds, and under strict control with reliable documentation, fish farmers may request exemption from this subparagraph and the Plant Board will respond to the request within 10 working days.
d. If only a portion of a participating farm is to be certified, it must be separated from the uncertified portion according to a biosecurity plan approved by the Plant Board. The uncertified portion must not be used to produce any fish species also sold by the farm as certified.
e. If the farm produces other fish species as sportfish, foodfish, or for other non-bait and ornamental purposes, those fish must be kept separate according to an approved biosecurity plan (H.d. above). Alternatively documentation of biosecure separation is not required if these other species are raised according to these Official Standards for bait and ornamental fish including ANS inspections and the submission of 150 of these fish twice a year for fish health inspection (for a total of 300 fish twice per year).
f. There will be no production or participation in the commerce of any salmonids species or any of the non-fish aquatic nuisance species listed in paragraph C. *Pathogenic and Aquatic Nuisance Species*.
g. Silver carp and bighead carp may not be stocked into bait or ornamental fish production ponds.
h. Certified fish may only be loaded on trucks into dry or disinfected tanks using water from the certified producer's fish farm. Trucks carrying uncertified fish may enter the loading area of a certified farm, but any tanks containing fish or water from an uncertified source must remain closed while loading or unloading certified fish.
i. If any fish or water from an uncertified source are to be unloaded into the holding facility of a certified farm, the water and fish must be separated from certified fish according to a biosecurity plan approved by the Plant Board.
j. No individuals, trucks, or equipment including boots, nets, and buckets

may enter any area that has contact with or drains into any water used by the farm for certified fish production if those individuals, trucks, or equipment have had contact with fish or water not included in the Arkansas Certification program or from wild fisheries. Such individuals, trucks, or equipment that have been disinfected just prior to entrance may enter these areas.

k. Farms will produce Certified fish according to Arkansas Plant Board approved best management practices for controlled species (Section D).

J. Inspections

The Director of the State Plant Board or his agent may conduct investigations and/or make inspections as necessary to assure conformity with these standards. In particular, at least annually, the Plant Board shall make an on farm inspection of water sources, ponds, fish handling areas, equipment, compliance with best management practices, and records of fish sales and purchases.

As part of this annual inspection, an inspector from the Plant Board will visit the farm once per year during the summer. A visual check of 50% of the total number of ponds on the farm will be made for snail species, zebra mussels and specific aquatic plants. All of the ponds must be inspected at least once every 2 years. One pond edge will be examined for listed plants and snails and a hard surface (e.g., pier, post, drainpipe, aerator float) will be checked for zebra mussels. Any suspect plants or mollusks will be collected and submitted to an expert for confirmation. For fish species, visual inspection of farm holding vats will be conducted to insure that certified fish species being held in vats do not contain the listed ANS. Farm records will be examined for evidence of commerce in listed species.

In addition to Plant Board inspections, as part of the bi-annual sampling of fish for disease testing, the independent agent sampling fish will make note of the observance of any listed aquatic nuisance species. The Agent will preserve any unidentified fish species taken as a part of normal sampling procedures and submit those specimens along with disease testing samples to an independent APHIS approved laboratory for identification.

Farms that do not pass these ANS inspections may not label or represent their fish as certified until all aquatic nuisance species have been eradicated and confirmed by a successful inspection. In addition, in order to maintain their certified status, these farms will undergo an additional aquatic nuisance species inspection one month after the first successful post eradication inspection. This follow up inspection will not be conducted during a period when the aquatic nuisance species would not be expected to be present, but will occur when conditions for detection are favorable. Farms that do not pass a BMP inspection may not label or represent their fish as certified until the deficiency is corrected and the farm passes a follow-up BMP compliance inspection.

K. Disease Testing

Each year, the certified producer or new applicants, must provide documentation of two consecutive years of freedom from certified pathogens from an independent laboratory approved by APHIS to test for the listed pathogens. Sampling, analysis and reporting is to be conducted as follows:

The sample must be 150 fish and must include moribund (sick) fish observed during the sampling process. It must be collected twice per year. Once during the months of October, November or December and once during the months of March, April or May.

Collection of the sample must be overseen by an APHIS accredited DVM. The collection must be made under the direct observation of the overseer to an extent that the official can attest to the origin of the fish and that the sampling scheme was appropriate to meet the standards detailed below.

The sample should include all of the ponds and grow out tanks and the final species and age composition of the sample should reflect the overall composition of the certified fish on the farm. For example, if the farm has 5 ponds of koi and 10 ponds of goldfish to be certified, the final sample of 150 fish should be from all of the ponds and should be 33 % koi and 67 % goldfish with each pond of fish equally represented. For a 150 fish sample, you would need 50 koi (10 from each of the 5 ponds), and 100 goldfish (about 10 from each of the 10 ponds). For farms with more than 50 ponds, all species and sizes of fish must be included in each sample, but the ponds may be sampled in rotation so that all ponds are sampled at least once every two years.It is not appropriate to sample fish from shipping and sorting facilities where fish are held for brief periods. The origin of these fish cannot be known with certainty and they may represent only a very low percentage of the fish lots present on the farm. Small numbers of some species may be efficiently captured with a dip net along the pond margin; other species may have to be captured with a small seine. In some cases, fish traps are appropriate. They may be placed in the ponds by the farmer but the sampling official must be present to oversee the checking of the traps and the removal of fish from the traps for the sample. Fish collected and removed from the ponds by the farmer without direct supervision by the overseer are not appropriate. Be sure to include any moribund fish that are observed during the sampling.

Farms testing positive for a listed certified pathogen may not label or represent their fish as certified until they have undergone a Plant Board supervised eradication, disinfection, re-establishment with fish from a certified source and have then re-established a 2-year history of disease free inspections according to the rules of this program. All Plant Board fees must be paid during the re-establishment period.

L. Certificates and Labeling

Producers accepted into the certification program will be issued official certificates, which are to be completed at the time the fish are loaded. Certificates are valid until the fish leave the certified producer's control. All certificates will bear the shipment date and shipper invoice number along with description of the shipment. All will expire within 2 weeks of issuance.

a. **Transference of Certification**

A certified producer may purchase fish from another certified producer then deliver those fish under their own certificate given that they receive a valid certificate from the seller and maintain that certificate in their records for inspection by the Plant Board.

ADDENDUM

BEST MANAGEMENT PRACTICES

Baitfish Best Management Practices: Gambusia

Pond Preparation

- Ponds are drained and dried between crops
- Any puddles or sumps that still contain water after the drying process are treated with a suitable pond bottom sterilant or piscicide

Pond Filling

- No surface water is used (an existing requirement of the Arkansas Certification Program)
- Water may be moved between ponds if the donor pond is known to be Gambusia-free or if the water is passed through a filter of sufficiently small porosity to remove Gambusia fry

Fry Production – *Fathead Minnows*

- No uncertified broodstock can be used (an existing requirement of the Certification Program)
- Broodstock must be inspected for Gambusia
- Broodstock cannot be used if Gambusia are present
- Gambusia-free broodstock can be hand selected from mixed fish populations

Fry Production – *Golden Shiners and Goldfish*

- No uncertified broodstock can be used (an existing requirement of the Certification Program)
- Broodstock must be inspected for Gambusia
- Broodstock cannot be used if Gambusia are present
- Gambusia-free broodstock can be hand selected from mixed fish populations

- When fish are hatched in tanks, eggs mats must be thoroughly disinfected by treatments with 50-100 ppm iodine or 500-1000 ppm formalin prior to hatch and fry transfer.

Biosecurity

- If seines, nets, fish haulers and other equipment are to be moved to baitfish production ponds from areas known or suspected to harbor Gambusia, the equipment must first be dried or treated with a suitable piscicide.

100% Certified Triploid Grass Carp Production Protocol and Best Management Practices

Spawning/Triploid Induction

1) All activities concerning broodstock and the hatchery facility will be supervised by a manager.
2) Diploid grass carp identified during farm level ploidy testing are stocked into earthen production ponds which are managed to grow aquatic vegetation for the purposes of feeding the grass carp. The standpipe of each pond is screened to prevent the escape of any fish.
3) In the spring of the year, diploid grass carp no less than 3 years of age are gathered from the production ponds and stocked into small 1 or 2 acre holding ponds under the supervision of a farm manager. The standpipe of each pond is screened to prevent the escape of any fish.
4) The holding ponds are fed daily with fresh cut green grass.
5) During the months of May, June and July groups of diploid grass carp are brought to the grass carp hatchery for spawning.
6) Under the supervision of a farm manager, a holding pond is seined with a ½ inch mesh net and the diploid grass carp broodstock are tranquilized with Quinaldine sulfate.
7) The hatchery manager selects four to eight males and females based on secondary sexually characteristics. The selected males and females are placed into separate hauling tanks for transport to the hatchery.
8) Once the diploid grass carp broodstock arrive at the hatchery, they are tranquilized using quinaldine sulfate and hand carried into the hatchery under the supervision of the hatchery manager. Each fish is individually weighed and tagged before placed into the broodstock holding tank. Females and males are held at separate ends of the broodstock holding vat separated by a divide placed in the middle of the broodstock holding tank and held in place with weights.
9) The broodstock holding tank is supplied with airstones for aeration and heated, filtered well water to maintain the water temperature between 76 and 80 degrees Fahrenheit.
10) The covers of the broodstock holding vat containing the diploid grass carp broodstock will be in the lowered position at all times except when the tank is being cleaned daily and when the broodstock are receiving injections or are being spawned. At such times the covers will be raised using the hand crank on the wall.
11) The floor drains in the aisle next to the broodstock holding tank are covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall while being handled. The drain pipe on the downstream end of the broodstock holding tank is screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the broodstock holding vat will remain in place at all times except when the tank is being cleaned daily, the tank is being flushed to remove tranquilizer or the tank is being dewatered for disinfection. Prior to removing the drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or discarded in the

mort bucket. Prior to removing the drainpipe to de water the broodstock holding tank, any fish remaining in the holding vat will be removed and transported to the diploid holding tanks in the testing lab or discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.

12) During the placement of broodstock grass carp in the broodstock holding tank, the diploid grass carp broodstock are given an injection of HCG to begin the process of egg maturation and induced spawning. Approximately 24 hours after the first injection the diploid grass carp broodstock are given a second injection of HCG to continue the process of egg maturation and induced spawning. Approximately 24 to 36 hours after the second injection the diploid grass carp broodstock are given a third injection containing carp pituitary to finish the process of egg maturation and induced spawning.
13) Eight hours following the last injection the diploid grass carp broodstock are tranquilized and the females are individually checked for readiness to spawn. If the females are not ready to spawn the holding tank is flushed with fresh water and left alone for one hour before the fish are tranquilized and checked again for readiness to spawn. Once the females have reached the proper state of readiness, spawning can begin. The spawning and triploid induction process is done on an individual female basis. Only one female is spawned at a time. Eggs from multiple females are not mixed. The spawning and triploid induction process for a given female is completed before another female is spawned.
    a) Once a female is ready to spawn, a cloth bag is placed over the females head and the fish is lifted from the water. The fish is dried with paper towels and the eggs are hand stripped into a large, dry plastic bowl. Following spawning, the female is returned to the broodstock holding tank and the bowl of eggs is covered and placed onto a bench in the hatchery.
    b) A male is selected and a cloth bag is placed over its head and the fish is lifted from the water. The fish is dried with paper towels and the milt is hand stripped into a glass measuring cup. Milt from two males is collected into the same measuring cup. Following stripping the males are returned to the broodstock holding tank and the measuring cup containing the milt is covered and placed on a bench in the hatchery.
    c) The eggs are then measured equally into two to five large, dry plastic bowls and placed on the bench. The milt is measured equally into each of the bowls containing eggs.
    d) Each bowl of eggs is individually fertilized, water hardened and treated to induce triploidy on an individual basis. Only one bowl of eggs is fertilized, water hardened and treated to induce triploidy at a time. The fertilization, water hardening and triploid induction process is completed for a given bowl before another bowl can be fertilized.
    e) The milt is mixed with the eggs in a given bowl and is activated by adding a measured volume of tempered water to the bowl. Two stop watches are started the instant the water is added to the bowl. Additional measured volumes of tempered water are added to the bowl at preset intervals.

f) At the appropriate time interval post fertilization, the excess water is poured off of the fertilized eggs into an empty bucket and the fertilized eggs are poured into the triploid induction apparatus.

g) The eggs remain in the triploid induction apparatus for a preset time interval and then they are poured into numbered incubation tanks.

h) Each incubation tank holds treated, fertilized eggs from a given bowl. Groups of treated, fertilized eggs are not mixed in incubators. Every bowl of eggs is placed into a separate incubator following fertilization and triploid induction.

Incubation/Fry Ploidy Testing

1) Incubation occurs in 65 gallon fiberglass conical bottom tanks. Filtered, heated well water is supplied to each incubation tank through an overhead de gassing and distribution tank. Water is introduced to the bottom of the incubation tank through a pipe with holes cut around its circumference to allow for equal distribution of flow. The water flows from the bottom of the tank in an upward direction gently rolling the treated, fertilized eggs concentrated in the conical bottom of the tank.
2) Each incubation tank has two drains through the side of the tank near the top. Each drain is screened modular "filters" which are covered in saran cloth having openings of less than 350 microns. Water flowing out of the incubation tanks through the modular filters travels down plastic hoses into a pvc drain pipe which flows into a floor drain. The end of the pvc drain pipe is fitted with a filter bag.
3) Each incubation tank also has a bottom drain which is plugged with a wooden dowel from inside the tank. A hose is attached to the outside of the bottom drain and extends to the top of the incubation tank and is held in place with plastic cable ties to prevent it from falling over.
4) Treated, fertilized eggs are incubated in the upwelling current of the incubation tanks for 24 hours before they begin to hatch. Incubation tanks are treated twice daily with formalin to prevent fungus.
5) Once hatching has begun, an air line is introduced to the bottom of the incubation tank and air is used to circulate the hatching eggs and newly hatched embryos in an upwelling current. Newly hatched grass carp are semi buoyant and would settle to the bottom of the incubation tanks and suffocate if the upwelling current created by the air flow was not present.
6) During the incubation process the modular screens are checked no less than every 2 hours to ensure they are not clogged with eggs shells or fungus which would cause the incubation tanks to overflow. If a modular screen begins to clog it is either turned, scrubbed or replaced with a new, clean modular screen. If the modular screen is replaced it is done in a manner to prevent any escape of eggs are fry.
7) Three days post hatch a sample of fry is taken from each incubation tank and tested in two replicates for each incubation tank using a flow cytometer. Groups of fry from different incubators are not mixed for ploidy testing.
8) The results of the flow cytometry indicate the approximate percentage of triploid fry in each incubation tank. Incubation tanks containing lots of fry comprised of less than 99% triploids are destroyed with bleach under the supervision of a farm manager. Incubation tanks containing lots of fry comprised of greater than 99% triploids are stocked into nursery ponds four days post hatch under the supervision of a farm manager.

Stocking/Nursery

1) Incubation tanks containing groups of high ploidy grass carp fry to be stocked are drained under the supervision of a farm manager to a volume of approximately 10 gallons using a siphon hose drawing water through a saran screen.
2) The wooden dowel plug at the bottom of the incubation tank is removed and the hose attached to the outside of the bottom drain is cut loose from the cable tie which is holding it in place at the top of the incubation tank.
3) As the hose is lowered from its position a farm manager plugs the end of the hose with a finger. The fry and water remaining in the incubation tank is drained through the hose into multiple plastic bags. Once the incubation tank is empty the plastic bags containing the fry are filled with air and sealed with rubber bands.
4) The bags containing the lots of high ploidy grass carp fry are then transported to prepared nursery ponds in the bed of a truck under the supervision of a farm manager. The nursery ponds had been dried several weeks prior and refilled with well water within one week of stocking. The standpipe on the nursery ponds is elevated above the top of the levee and tied in position.
5) The bags containing the lots of high ploidy grass carp fry are then tempered at the water's edge and the fry are released into the nursery pond under the supervision of a farm manager.
6) Each nursery pond will receive fry from an individual female. Fry from multiple females are not mixed in nursery ponds. Fry from multiple incubation tanks from the same female may be mixed in nursery ponds if the ploidy of each incubation tank is similar.
7) The high ploidy grass carp fry remain in the nursery ponds for 1 to 12 months.
8) At two weeks post stocking fingerlings from each nursery ponds are sampled individually using a coulter counter to determine the ploidy of each nursery pond. Nursery ponds containing lots of grass carp fingerlings comprised of less than 98% triploids are destroyed under the supervision of a farm manager.
9) All activities within the nursery ponds and hatchery will be supervised by a manager.

Fingerling Harvest

1) Beginning 1 to 2 months post stocking nursery ponds are harvested using an 1/8 inch mesh seine under the supervision of a farm manager.
2) Untested high ploidy groups of fingerlings are netted from the seine and transported to hauling tanks in five gallon buckets.
3) The transport tanks carry the untested high ploidy fingerlings to the holding facility and where they are piped into a holding tank.
4) The covers of the holding vat containing the untested high ploidy lots of grass carp fingerlings will be in the lowered position at all times except when the tank is being cleaned daily and when the fingerlings are being handled. At such times the covers will be raised using the hand crank on the wall.
5) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tanks will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place at all times except when the tank is being cleaned daily or the tank is being dewatered for disinfection. Prior to removing the drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or discarded in the mort bucket. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
6) All activities within the nursery ponds and holding facility will be supervised by a manager.

Fingerling Stocking

1) After 1 to 2 days of purging the groups of untested high ploidy fingerlings are sampled by blood testing 120 to 300 individual fish by means of a coulter counter. The sampling determines the average ploidy of each group and identifies size gradients within each group which could be graded from the group to improve the ploidy of the group.
2) If the ploidy of a group is less than 99% or cannot be graded up to 99% the group of fingerlings is destroyed under the supervision of a farm manager.
3) If necessary the group is graded to improve the ploidy or to reduce size variation.
4) One day following grading the group of high ploidy untested fingerlings is loaded into hauling tanks and transported to growout ponds under the supervision of a farm manager. Each group is counted and weighed so that the appropriate number of fingerlings is stocked into each pond.
10) The growout ponds have been previously drained, dried, disked and refilled using either well water or filtered pond water from an adjacent growout pond. The standpipe on the growout ponds is elevated above the top of the levee and tied in position.
5) The fingerlings in the hauling tanks are tempered on the levee by exchanging water from the growout pond being stocked with the water in the hauling tanks.
6) Once tempering is complete the fingerlings are piped into the growout ponds under the supervision of a farm manager.

Marketable Fish Harvest

1) Beginning 2 to 3 months post stocking groups of marketable size untested high ploidy grass carp are ready for harvest.
2) Under the supervision of a farm manager, bait is placed in the corner of a growout pond and a ¾ inch seine is used to catch marketable size untested high ploidy grass carp for a specific order.
3) The fish are tranquilized using quinaldine sulfate and transported to hauling tanks in 20 gallon plastic tubs.
4) The fish are placed into the hauling tanks and transported to the holding facility.
5) The transport tanks carry the untested high ploidy grass carp to the holding facility where they are piped into a holding tank.

Holding lots of untested high ploidy marketable grass carp

1) The covers of the holding vat containing the untested high ploidy lots of grass carp will be in the lowered position at all times except when the tank is being cleaned daily and when the fish are being handled. At such times the covers will be raised using the hand crank on the wall.
2) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tanks will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place at all times except when the tank is being cleaned daily or the tank is being dewatered for disinfection. Prior to removing the drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or discarded in the mort bucket. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
3) All effluents from the holding facility will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
4) No untested high ploidy group of grass carp will be held in a holding tank adjacent to any holding tank containing 100% producer tested triploid grass carp or 100% certified triploid grass carp.
5) Any grass carp found on the floor of the holding facility shall be discarded in the mort bucket. No grass carp found on the floor of the holding facility is to be returned to any holding vat.
6) All holding vats containing groups of untested high ploidy grass carp or tested or certified grass carp shall be clearly marked as such.
7) All holding vats containing groups of untested high ploidy grass carp or tested or certified grass carp shall be 100 feet from the nearest pond containing untested grass carp and shall be housed in a manner to prevent the movement o f untested fish by animals.
8) All activities within the holding facility will be supervised by a manager.

Moving lots of untested high ploidy marketable grass carp to the testing lab

1) The covers of the holding vat containing the untested high ploidy lots of grass carp to be tested will be raised using the hand crank on the wall.
2) The untested grass carp in the holding tank will be tranquilized using quinaldine sulfate
3) The untested grass carp will be seined to the downstream end of their holding tank at a speed sufficient to prevent spooking the fish causing them to jump out of the holding tank.
4) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tank will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place during the movement of the untested fish. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and transported to the testing lab or discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
5) All effluents from the holding facility and blood testing lab will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
6) The untested grass carp will either be dip netted or hand counted into the crane transport container which will contain enough water to prevent stressing the fish during transport.
7) The overhead crane will carry the crane transport container to the testing lab. The fish will be piped from the crane transport container into lab holding vat C. The crane transport tank shall be operated a safe distance from any holding vat containing tested or certified triploid grass carp sufficient to prevent any fish from jumping out of the crane transport tank and into a holding vat containing triploid or certified grass carp. Any fish which jumps out of the crane transport tank or is found on the holding shed floor shall be discarded in the mort bucket.
8) The covers of the lab holding vat C containing the untested high ploidy lots of grass carp to be tested will be in the lowered position at all times except when the tank is being cleaned daily and when the untested fish are being tested. At such times the covers will be raised using the hand crank on the wall.
9) The floor drains in the aisle between holding tanks in the lab will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tanks in the lab will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place at all times except when the tank is being cleaned daily or the tank is being dewatered for disinfection. Prior to removing the drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or discarded in the mort bucket. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and transported to the diploid holding tanks in

the testing lab or discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.

Farm Level Triploid Testing Prior To USFWS Inspection

1) The covers of lab holding vat C containing the untested high ploidy lots of grass carp to be tested will be raised using the hand crank on the wall.
2) Untested high ploidy lots of grass carp being held in lab vat C will be tranquilized using quinaldine sulfate.
3) The untested grass carp will be seined to the downstream end of their lab holding vat C at a speed sufficient to prevent spooking the fish causing them to jump out of the holding tank.
4) The floor drains in the aisle between holding tanks in the lab will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tanks in the lab will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place at all times except when the tank is being cleaned daily or the tank is being dewatered for disinfection. Prior to removing the drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or discarded in the mort bucket. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and transported to the diploid holding tanks in the testing lab or discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
5) All effluents from the blood testing lab will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
6) The tranquilized lot of untested high ploidy grass carp will be sized by hand using measuring boards. The fish shall be classified as 8 inch minimum, 10 inch minimum and 12 inch minimum. Each fish will be measured, classified and segregated into a division of lab holding vat C.
7) When a segregated size class of untested high ploidy grass carp is to be tested the group is tranquilized using quinaldine sulfate and crowded in a seine.
8) The tranquilized untested high ploidy grass carp are then dip netted or hand counted into a holding pan containing water with quinaldine sulfate housed on a cart with wheels. There are a maximum of three carts in operation at any given time.
9) The carts holding the pans of tranquilized untested high ploidy grass carp are placed next to the pokers at blood sampling station.
10) The poker then picks up individual fish and uses a hypodermic needle mounted into the end of a glass test tube to poke the fish in the isthmus until a bead of blood is drawn. Experienced pokers can accomplish this with one poke.
11) Once a bead of blood is drawn the poker extends their arm slightly towards the pipetter.
12) The pipetter uses a pipette to draw approximately 1ul of blood. The blood sample is then expelled into an accuvettes containing 10 ml of isoton solution with zapoglobin.
13) The accuvette containing the blood sample is placed into a color coded, number coded tray.
14) The fish is placed into a corresponding color coded, number coded floating net.

15) Once all of the spaces on the tray and corresponding floating net are full, the tray is handed to the coulter counter operator.
16) Each accuvette containing a blood sample from an individual fish is placed into the coulter counter and is analyzed. The coulter counter measures the diameter of the red blood cells. The operator ensures that the histogram displayed on the coulter counter has cleared between samples. Once the new histogram for the new sample is displayed the coulter counter operator makes the determination as to whether the sample produces a triploid reading, a diploid reading or an undetermined reading.
17) If the sample is determined to produce a triploid reading the accuvette is removed from the coulter counter and discarded.
18) If the sample is determined to produce a diploid reading, an accuvette containing red liquid is placed in the numbered corresponding location on the tray from which the sample came from. The accuvettes containing the sample is then discarded.
19) If the sample is determined to produce an undetermined reading, the coulter counter operator requests a new sample be taken from the corresponding fish. A lab employee retrieves the fish from the corresponding color coded, number coded floating frame and brings it to a poker. The poker pokes the fish in the isthmus and the pipetter draws a blood sample and expels it into an accuvette containing 10 ml of isoton with zapoglobin. The lab employee who retrieved the suspect fish carries both the fish and the accuvettes containing the new sample to the coulter counter operator. The coulter counter operator then analyzes the new sample. If the sample is determined to produce a triploid reading the fish is returned to its floating net. If the sample is determined to produce a diploid or undetermined reading the fish is placed into lab holding vat A or B.
20) Once all samples on a color coded, number coded tray have been analyzed, a lab employee carries the tray to the end of the lab floating tank. All lab employees stop their assigned tasks and watch the lab employee carrying the tray. The lab employee with the tray then verbally calls out the color and number of each red accuvette on the tray. As the lab employee calls out the location of the red accuvettes, the lab employee removes the corresponding fish from the floating net and places it into lab holding vat A or B. Once all fish corresponding to red accuvettes on the tray have been removed from the tray, the fish remaining on the corresponding floating net are placed into the temporary triploid isolation tank. In the event there are no red accuvettes on a tray, the lab employee verbally calls out the color of the tray followed by the phase "is good". All lab employees then stop their assigned tasks and watch the lab employee carrying the tray as the lab employee places all of the fish on the corresponding floating net into the temporary triploid isolation tank.
21) Once all untested high ploidy fish from a segregated size class have been individually tested and all fish whose blood samples produced a diploid or undetermined result have been removed from the lot, a sub sample of 120 fish is taken from the temporary triploid isolation tank. Each of the 120 fish is then individually retested using the same protocol. If all samples from each of the 120 fish produce a triploid reading, all fish in the temporary triploid isolation tank may be transported using the crane to a 100% producer tested holding vat. If any of the samples from each of the 120 fish produce a diploid or undetermined reading, all fish in the temporary triploid

isolation tank must be placed back into holding vat C and individually retested using the same protocol.

22) Holding vats containing 100% producer tested fish must be 6 feet from any vat containing diploid or untested grass carp and must display a sign which indicates the vat contains 100% producer tested fish.
23) All activities in the blood testing lab and the holding facility will be supervised by a manager and will be recorded on closed circuit television cameras.

Isolation of 100% Producer Tested Grass Carp

1) The covers of the holding vat containing the 100% producer tested lots of grass carp will be in the lowered position at all times except when the tank is being cleaned daily and when the fish are being handled. At such times the covers will be raised using the hand crank on the wall.
2) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled.
3) The drain pipe on the downstream end of the holding tanks will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place at all times except when the tank is being cleaned daily or the tank is being dewatered for disinfection. Prior to removing the drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or discarded in the mort bucket. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
4) All effluents from the holding facility will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
5) No groups of 100% producer tested grass carp will be held in a holding tank adjacent to any holding tank containing untested or diploid groups of grass carp.
6) Any grass carp found on the floor of the holding facility shall be discarded in the mort bucket. No grass carp found on the floor of the holding facility is to be returned to any holding vat.
7) All holding vats containing groups of 100% producer tested grass carp shall be clearly marked as such.
8) All holding vats containing groups of 100% producer tested grass carp shall be 100 feet from the nearest pond containing untested grass carp and shall be housed in a manner to prevent the movement of untested fish by animals.
9) All activities in the holding facility will be supervised by a manager and will be recorded on closed circuit television cameras.

Triploid Inspection and Certification

1) The lab manager maintains contact with the USFWS triploid grass cap inspector. It is understood that the USFWS inspector is available to conduct inspections on Monday, Wednesday and Friday.
2) When an inspection is needed the lab manager arranges a time with the inspector.
3) Prior to the arranged inspection, the lab manager completes the pre inspection portion of the USFWS Checklist for Triploid Grass Carp inspections and ensures all requirements have been met.
4) Upon arrival at the farm the inspector is presented with the checklist which contains the location and quantity of 100% producer tested lots to be inspected.
5) The inspector indicates how many fish are to be randomly collected from each tank and supervises the collection of the random sample by the lab employees.
6) The inspector then supervises the collection and channelization of blood samples from known diploid grass carp and records the results on the checklist. 2.8 um Beads may be substituted.
7) The inspector then supervises the collection and channelization of individual blood samples from the random sample of 100% producer tested grass carp according to the standards of the USFWS Triploid Grass Carp Ploidy Inspection Program.
8) If all of the randomly sampled fish tested under the supervision of the USFWS inspector are shown to be triploid, the inspection is passed and certificates may be issued.
9) If even one diploid is found among the randomly sampled fish tested under the supervision of the USFWS inspector, the inspection is failed and no certificates may be issued. Every fish in the lots being inspected must be individually retested by the producer before another inspection can be scheduled.
10) Once a lot has passed USFWS inspection the USFWS will issue certificates of inspection indicating that the lot met the requirements of the USFWS inspection and certification program.
11) The inspector will complete the certificate with information provided by the producer. The inspector will sign and emboss the original certificate indicating the lot met the requirements. The producer will sign the original certificate authorizing the inspector to release the certificate to the receiving State. Photocopies of the original certificate will be made. The original will accompany the shipment, one copy will be maintained by the producer and one copy will be maintained by the inspector and faxed to the receiving State.
12) A copy of the checklist will be made. The original will be maintained by the producer, one copy will be maintained by the inspector.
13) See USFWS Standards regarding changes to certificates and expiration of certificates.
14) All activities in the holding facility and blood testing lab will be supervised by a manager and will be recorded on closed circuit television cameras.

Isolation of 100% Certified Triploid Grass Carp

1) The covers of the holding vat containing the 100% certified lots of grass carp will be in the lowered position at all times except when the tank is being cleaned daily and when the fish are being handled. At such times the covers will be raised using the hand crank on the wall.
2) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled.
3) The drain pipe on the downstream end of the holding tanks will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place at all times except when the tank is being cleaned daily or the tank is being dewatered for disinfection. Prior to removing the drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or discarded in the mort bucket. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
4) All effluents from the holding facility and blood testing lab will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
5) No groups of 100% certified grass carp will be held in a holding tank adjacent to any holding tank containing untested or diploid groups of grass carp.
6) Any grass carp found on the floor of the holding facility shall be discarded in the mort bucket. No grass carp found on the floor of the holding facility is to be returned to any holding vat.
7) All holding vats containing groups of 100% certified grass carp shall be clearly marked as such.
8) All holding vats containing groups of 100% certified grass carp shall be 100 feet from the nearest pond containing untested grass carp and shall be housed in a manner to prevent the movement of untested fish by animals.
9) All activities in the holding facility will be supervised by a manager and will be recorded on closed circuit television cameras.

100% Certified Triploid Grass Carp Sale

1) The covers of the holding vat containing the certified lots of grass carp to be sold will be raised using the hand crank on the wall.
2) The certified grass carp in the holding tank will be tranquilized using quinaldine sulfate
3) The certified grass carp will be seined to the downstream end of their holding tank at a speed sufficient to prevent spooking the fish causing them to jump out of the holding tank.
4) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tank will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place during the movement of the untested fish. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and transported to the testing lab or discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
5) All effluents from the holding facility and blood testing lab will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
6) The certified grass carp will be dip netted or hand counted into tubs or the crane transport container which will contain enough water to prevent stressing the fish during transport.
7) The overhead crane will carry the crane transport container to the hauling truck. The fish will be piped from the crane transport container into the hauling truck. The crane transport tank shall be operated a safe distance from any holding vat containing tested or certified triploid grass carp sufficient to prevent any fish from jumping out of the crane transport tank and into a holding vat containing triploid or certified grass carp. Any fish which jumps out of the crane transport tank or is found on the holding shed floor shall be discarded in the mort bucket.
8) The tubs will be hand carried to the hauling truck and poured into the hauling truck. The tubs shall be carried a safe distance from any holding vat containing tested or certified triploid grass carp sufficient to prevent any fish from jumping out of the tub and into a holding vat containing triploid or certified grass carp. Any fish which jumps out of the tub or is found on the holding shed floor shall be discarded in the mort bucket.
9) Every customer purchasing 100% certified triploid grass carp which is required by the receiving State to maintain any permit for grass carp must provide a copy of their permit to the sales office prior to purchasing triploid grass carp.
10) Every customer is provided with an invoice which indicates the quantity, size, cost of the triploid grass carp purchased as well as the State for which the triploid grass carp certificate was issued.
11) Every customer is provided with the original embossed triploid grass carp certificate.
12) All activities in the holding facility and sales office will be supervised by a manager and will be recorded on closed circuit television cameras.
13) All records regarding sale of certified triploid grass carp will be kept for a period of 7 years

14) No sale will be finalized if the permit/paperwork/customer is suspect. We reserve to right not to sell fish to anyone.

Diploid (Untested) Grass Carp Sale

1) Holding tanks containing diploid or untested grass carp must be marked as such.
2) Holding tanks containing diploid or untested grass carp must be 6 feet from any tank containing tested or certified triploid grass carp.
3) The covers of the holding vat containing either untested lots of high ploidy grass carp or diploid grass carp to be sold will be raised using the hand crank on the wall. Whenever possible untested lots of high ploidy grass carp will be sold as diploids.
4) The grass carp in the holding tank will be tranquilized using quinaldine sulfate
5) The grass carp will be seined to the downstream end of their holding tank at a speed sufficient to prevent spooking the fish causing them to jump out of the holding tank.
6) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tank will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place during the movement of the untested fish. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and transported to the testing lab or discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
7) All effluents from the holding facility and blood testing lab will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
8) The grass carp will be dip netted or hand counted into tubs or the crane transport container which will contain enough water to prevent stressing the fish during transport.
9) The overhead crane will carry the crane transport container to the hauling truck. The fish will be piped from the crane transport container into the hauling truck. The crane transport tank shall be operated a safe distance from any holding vat containing tested or certified triploid grass carp sufficient to prevent any fish from jumping out of the crane transport tank and into a holding vat containing tested or certified triploid grass carp. Any fish which jumps out of the crane transport tank or is found on the holding shed floor shall be discarded in the mort bucket.
10) The tubs will be hand carried to the hauling truck and poured into the hauling truck. The tubs shall be carried a safe distance from any holding vat containing tested or certified triploid grass carp sufficient to prevent any fish from jumping out of the tub and into a holding vat containing tested or certified triploid grass carp. Any fish which jumps out of the tub or is found on the holding shed floor shall be discarded in the mort bucket.
11) Every customer purchasing diploid grass carp which is required by the receiving State to maintain any permit for grass carp must provide a copy of their permit to the sales office prior to purchasing triploid grass carp.
12) Every customer is provided with an invoice which indicates the quantity, size, cost of the grass carp purchased.

13) All activities in the holding facility and sales office will be supervised by a manager and will be recorded on closed circuit television cameras.
14) All records regarding sale of diploid (untested) grass carp will be kept for a period of 7 years
15) No sale will be finalized if the permit/paperwork/customer is suspect. We reserve to right not to sell fish to anyone.

F

FEDERAL INSPECTION TEMPLATES

National Analysis
of Grass Carp
(*Ctenopharyngodon idella*)

Verification Checklist for Triploid Grass Carp Inspections

(amended 8-2010)

Date: _____ Time: _____

Inspection Number: _____ Facility: _____

This checklist is used by both producers and inspectors upon arrival and during the inspection as a Quality Assurance/Quality Control document to verify inspection procedures are followed according to the standards. The Producer will present this checklist to the Inspector upon arrival at the farm site. The Producer and or Inspector will initial each check list requirement upon completion as indicated below. Deviations should be recorded below each requirement as needed. Any failures indicated below will terminate the inspection process. Unless circumstances can be resolved immediately on site the inspection will be re-scheduled for another date and time. The Inspector will then depart the farm site. A letter of warning/concern will be issued by the inspector or supervisor via US Postal Service within 3 business days. *Producer Initials= P____, Inspector Initials=I_____ after each check criteria below.*

1. Prior to scheduling an inspection the producer must individually test the group of grass carp for ploidy, remove all non triploid fish and segregate the triploid grass carp within isolated labeled containment units.
   Date(s) of pre-screening of fish_____ P___

2. The Producer should contact the USFWS Inspector to schedule an inspection 48 hours prior to inspection. Inspectors may schedule inspections with less notice at their discretion.
   Time Scheduled: _____ P____ I____

3. Producers should have a minimum of 1500 fish ready to ship to schedule an inspection. An inspection request of smaller groups of fish is permitted at the discretion of the inspector.

   Reported Number of Fish to inspect: _____ Actual Number of Fish to inspect: _____
   P____I____

4. The Producer will provide the Inspector upon arrival the location and number of isolated alleged 100% individually producer tested triploids using the table below. **Max. Lot Size for One Inspection: 6000 Fish**

Tank Number (ID)	Number of screened Triploids	Number of fish selected by Inspector
	Total all tanks:	**Total : 120**

5. Inspector visually checks number of fish in vats/tanks. Water in vats/tanks must be provisioned with water clear enough for the inspector to observe quantity/quality of fish. If water clarity is marginal due to unique event, indicate how fish were observed: _____
   ☐**PASS** ☐**FAIL** **Type Failure:** ☐**C** P____ I____

6. Untested grass carp and diploid grass carp used for controls and/or for sale are isolated in separate, labeled containment units (vat/tank) on the producers site at least six (6) feet away from the alleged 100% individually producer tested triploid grass carp group(s) being isolated for subsequent certification by inspectors.
   ☐**PASS** ☐**FAIL** **Type Failure:** ☐**C** P____ I____

7. Alleged 100% individually producer tested triploids must be isolated 100 feet from production ponds holding grass carp and tanks are labeled.
   ☐**PASS** ☐**FAIL** **Type Failure:** ☐**C** P____ I____

8. Fish for inspection have visible prick mark indicating recent blood testing.
   P___ I___

   ☐**PASS** ☐**FAIL** **Type Failure:** ☐**C**

9. Inspector supervises and directs the selection of the random 120 fish sample used in the inspection process.
   ☐**PASS** ☐**FAIL** **Type Failure:** ☐**D** P___ I___

10. A minimum of two diploid grass carp control fish from the producer's site (and preferably taken from the lot of fish being certified) are collected under the supervision of the inspector to be used to calibrate the producer's particle sizing equipment for each and every inspection. As an option, 2.8 micron polystyrene beads may be used as a standard to calibrate when diploids are unavailable at the time of the inspection.
    P___ I___

11. Inspector supervises analysis of control samples to confirm working status of particle sizer.
    Inspection start time: _____ ☐AM ☐PM P___ I___

First diploid control readings: (1) _____ (2) _____ (3) _____	P____ I____
Second diploid control readings: (1) _____ (2) _____ (3) _____	P____ I____
2.8 μm^3 Polystyrene bead reading (1) _____ (optional)	P____ I____
2.0 μm^3 control bead reading (1) _____ (2) 5.0 μm^3 _____ (optional)	P____ I____
The producer's particle sizer is in good working order for the inspection: ☐**PASS** ☐**FAIL** Type **Failure: B**	
If Fail, Explain: _____	P____ I____

12. Inspector supervises the 120 fish sample testing and channelizes every tenth sample, recording the modal peak reading (μm^3):

    1_____ 2_____ 3_____ 4_____ 5_____ 6_____ 7_____ 8_____ 9_____ 10_____ 11_____ 12_____

    Inspection testing end time: _____ ☐AM ☐PM **Inspection Status:** ☐**PASS** ☐**FAIL**
    If status Fail, Indicate Type Failure: ☐**A** ☐**B** P___ I___
    Modal peak reading for suspect sample_____
    Remarks: _____

Number Certificates Issued under this Inspection: _____

Tank Number	Destination Customer Name State	Number of Fish	Date of Departure	Certificate Number	Date of expiration
	Total Fish Shipped:				

If addition space is needed use continuation sheet attached.

Inspector's Signature_____ Producer's Signature_____
Time of Inspector departure from farm site: _____ ☐AM ☐PM

Inspection Certificates Continued: Inspection Number_____

Tank Number	Destination Customer Name State	Number of Fish	Date of Departure	Certificate Number	Date of expiration

Total Fish Shipped:

Checklist for Scheduling an Inspection

Date of Request: _____

This checklist is used by inspectors to validate a producer's request to schedule an inspection. This is a Quality Assurance/Quality Control document that must be completed by the inspector prior to departure to the farm site to conduct an inspection. All requirements must be validated as indicated below. Deviations should be recorded below each requirement as needed. No scheduling will occur unless all requirements are met.

1. Producers will recognize that each Inspection Office will keep one day "free" for other USFWS activities, and accordingly, the Producers will request Certification Inspections for an alternate weekday. The Producer will give the USFWS Inspector sufficient notice that a ploidy inspection is needed; a minimum of two business days (48hrs.) should given to allow the USFWS Inspector sufficient time to adjust his/her schedule. Inspectors may schedule inspections with less notice at their discretion. **Conveyed:** □**Yes** □**No**

2. Producers should have a minimum of 1500 fish ready to ship in order to schedule an inspection. Inspection requests for groups of fish of less than 1500 will only be performed when agreed upon, in advance, by the USFWS Inspector. The Grass Carp Producer will identify the number of fish expected to be shipped and provide this number to the Inspector.

   Number _____ Conveyed: □**Yes** □**No**

3. A minimum of two diploid grass carp control fish from the Producer's site (and preferably taken from the lot of fish being certified) will be used to calibrate the inspection equipment for each and every inspection. As an option, 2.8 micron polystyrene beads may be used as a standard to calibrate when diploids are unavailable at the time of the inspection. **Conveyed:** □**Yes** □**No**

4. The Producer will individually check the group of grass carp for ploidy, and segregate the triploid grass carp within isolated labeled containment units (vat/ tank) prior to the Inspection visit by the USFWS Inspector. **Conveyed:** □**Yes** □**No**

5. Diploid grass carp used for controls and/or for sale must be isolated in separate labeled containment units (vat/tank) on the producers site at least six (6) feet away from the presumptive triploid grass carp group(s) being contained for subsequent certification by inspectors. **Conveyed:** □**Yes** □**No**

6. The producer's Coulter Counter and Channelizer/Computer equipment will be in acceptable working order prior to on-site arrival of the USFWS Inspector. The Producer will contact the Inspector within 2 hrs. of the scheduled inspection time to report any equipment problems resulting in a cancellation of the Inspection. **Conveyed:** □**Yes** □**No**

Inspection Date_____ Inspection Time_____

Inspector's Signature_____

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Springfield, IL 62703-5143
217.585.8300

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We practice increased use of sustainable materials and reduction of material use.

J.M. Malone and Son, Inc.

"A Leader in Fisheries….Since 1952!"

Internal

National Analysis of Grass Carp

Regulation, Production, Triploid Certification, Shipping and Stocking

By Robert P. Glennon

July 2014

Contents

Appendices

List of Acronyms

BMP	Best Management Practices
MICRA	Mississippi Interstate Cooperative Resource Association
NTGCICP	National Triploid Grass Carp Inspection and Certification Program
SOP	Standard Operating Procedures
USFWS	United States Fish and Wildlife Service

1 Executive Summary

J.M. Malone and Son, Inc. is the World's Largest Producer of USFWS certified triploid grass carp. The company pioneered the commercial production and testing of triploid grass carp, drafted the first set of inspection standards and initiated the USFWS involvement in the inspection and certification process. Following the release of the draft report on the National Analysis of Grass Carp Regulation, Production, Triploid Certification, Shipping and Stocking by HDR, J.M. Malone and Son, Inc. prepared the following internal analysis based on its 42 years of experience in the grass carp industry. Minimal data points and survey results were gleaned from the HDR draft report to meet the requirements of the objectives concerning total numbers of legally stocked diploid fish, inspection and enforcement statistics and rationale for regulations from the States.

The document is organized according to the objectives of the project as written with discussion throughout. A clear, concise and unbiased analysis of National Grass Carp Regulation, Production, Triploid Certification, Shipping and Stocking is summarized in the conclusion.

2 Introduction

2.1 Background

Grass carp were introduced to the U.S. by the USFWS Fish Farm Experiment Station in Stuttgart, Arkansas and Auburn University with the assistance of the U.N. F.A.O. in 1963 for research as biological controls for nuisance aquatic vegetation in public waters and aquaculture (Stevenson 1965). Both facilities successfully spawned grass carp in 1966 (Sills 1970, Bailey and Boyd 1972.) and by 1971 fish from the 1966 year class were captured in the Illinois portion of the Mississippi River (Greenfield 1973). Production and stocking of grass carp by State facilities began in Arkansas in 1970 (Bailey and Boyd 1972) and the first stocking of an open water system occurred in December 1971 (Bailey 1972.). In 1974 grass carp began to appear frequently in the Mississippi Valley and a major influx of grass carp from the 1971 year class appeared in Missouri (Pflieger 1975) presumably from the open water stocking which occurred in Arkansas that year.

Commercial production of grass carp in the United States began in 1974 and early sale and distribution of diploid grass carp was widely un-regulated until 1977. The commercial production of 100% ploidy tested triploid grass carp began in 1983 and USFWS involvement in the ploidy testing and verification of lots of triploid grass carp began in 1985. The ploidy testing and verification process was developed and initiated by a commercial producer at the bequest of receiving States which wanted assurances that the lots of triploid grass carp being shipped into their State did not contain diploid fish. Between 1985 and 1995 the USFWS involvement in the triploid grass carp ploidy verification process was performed as a service to States receiving shipments of triploid grass carp. In 1995 the USFWS involvement in the triploid grass carp ploidy inspection and verification process was formalized with the passage of the Triploid Grass Carp Act which authorized the USFWS to collect a reasonable

per fish fee to cover the cost of the administration of the National Triploid Grass Carp Inspection and Certification Program (Malone 1996).

Despite the development of the Certified Triploid Grass Carp industry and the National Triploid Grass Carp Inspection and Certification Program, feral populations of diploid grass carp have spread and become established throughout the Mississippi River Basin. These feral populations are likely the result of escapement during the 1960's, un-regulated stocking of diploid grass carp by States and commercial producers in the 1970's and legal production, distribution and stocking of diploid grass carp which have been and are currently allowed by some States within the Mississippi River Basin.

Concerns over the distribution of feral Asian carp populations in the Mississippi River Basin prompted multiple state and federal agencies, private aquaculture companies, consultants and nongovernmental organizations participated in the development of the Management and Control plan for Bighead, Black, Grass and Silver Carps in the United States. The Mississippi Interstate Cooperative Resource Association (MICRA) and the Mississippi River Basin Panel have identified several recommendations from the Control Plan as high priority and are working to implement these recommendations. One of these recommendations was to evaluate the effectiveness of the National Triploid Grass Carp Inspection and Certification Program (NTGCICP) and to recommend reasonable actions that would improve the integrity, efficiency and effectiveness of the program.

The sole purpose of the NTGCICP is to provide third party assurances within the confidence level of the program to receiving States that lots of certified grass carp do not contain diploid fish and to issue ploidy certificates required by States to lots of grass carp which have met the standards of the program from participating commercial triploid grass carp producers. Most states which permit the import/possession/sale/distribution/stocking of triploid grass carp require shipments of triploid grass carp coming into their state to be "Certified by USFWS or another competent authority identified by the state" as an assurance that the shipment does not contain diploid fish. Participation in the NTGCICP is voluntary.

Before a producer may participate in the NTGCICP the producer must first pass a site inspection and sign an MOA with the USFWS. As a participant in the program the producer must follow the program standards. These standards govern the manner in which grass carp are housed in a producer's facility and require a producer to individually blood test each fish in a lot to identify and remove diploid fish from the lot prior to a program inspection of the 100% farm level tested lot of grass carp. In order to receive a ploidy certificate required by a State each 100% farm level tested lot of grass carp must pass a random inspection supervised by a program inspector. All of the grass carp in a random sample from the 100% farm level tested lot being inspected must be determined to be triploid and the inspector must verify that all of the standards for producers have been met. Once a certificate is issued the certified lot must be shipped within 6 days or the certificate expires and the lot must be re inspected and another certificate issued.

The authority of the NTGCICP ends with the issuance of a ploidy certificate to the participating commercial triploid grass carp producer. The NTGCICP does not regulate the shipment or sale of certified triploid grass carp and does not regulate the wholesale or retail consumer of the lot of certified triploid grass carp for which a certificate has been issued. The ploidy certificate must accompany the shipment of certified fish and each shipment is subject to inspection by State law enforcement. The NTGCICP charges participating producers a fee per fish certified and also administers a fine structure for non compliance should a participating producer fail to meet the standards of the program. A producer's participation in the NTGCICP may also be terminated for a history of non compliance or for severe infractions regarding the shipment of grass carp in violation of State or Federal law.

2.2 Project Overview

The evaluation of the NTGCICP recommended by the Management and Control plan for Bighead, Black, Grass and Silver Carps in the United States became a national review of Grass Carp regulation, production, triploid certification, shipping and stocking. The national review had eight primary objectives which are listed below concerning the regulation, production, triploid certification, shipping and stocking of grass carp in the United States.

Objective 1: **Gather, analyze and summarize** regulations, SOPs and BMPs employed at commercial triploid grass carp production facilities to contain grass carp and prevent diploid contamination of certified lots of triploid grass carp.

Objective 2: **Analyze** the effectiveness of the National Triploid Grass Carp Inspection and Certification Program at preventing the shipment of diploid grass carp.

Objective 3: **Collect and analyze** SOPs and BMPs employed by commercial fish haulers to prevent the contamination of diploid grass carp in triploid shipments and to prevent the introduction of diploid or triploid grass carp in water bodies where either fish is prohibited.

Objective 4: **Analyze** inspection programs, regulations, and enforcement employed by states receiving certified shipments of triploid grass carp to ensure that grass carp are stocked in accordance with state regulations.

Objective 5: **Compile** state rationale, regulations and regulatory implementation regarding triploid or diploid grass carp importation, possession, transportation, culture, sale and stocking.

Objective 6: **Identify and analyze** sources and pathways in the production, triploid certification, shipping and stocking of grass carp not covered in the previous objectives whereby diploid grass carp may enter the triploid supply chain.

Objective 7: **Recommend** reasonable actions (SOPs or BMPs) and/or regulations, where necessary, for producers, inspection programs, shippers and states to reduce the risk of unintended introductions of diploid grass carp.

Objective 8: **Gather, analyze, and summarize** regulations, procedures, total numbers, and disposition of legal diploid grass carp produced, shipped and stocked by commercial and state facilities.

3 Objective 1-Commercial Triploid Grass Carp Production Facilities: Containment and Contamination

3.1 Summary of regulations required of triploid grass carp producers

3.1.1 State Regulations concerning NTGCICP participating producers

There are 9 commercial producers of triploid grass carp which participate in the NTGCICP and they are located in five States. The State regulations which govern the activities at these commercial triploid grass carp production facilities to contain grass carp and prevent diploid contamination of certified lots of triploid grass carp are summarized as follows:

3.1.1.1 Arkansas

There are four commercial triploid production facilities in the State of Arkansas which participate in the NTGCICP. These four facilities account for over 98% of the certified triploid grass carp produced in the United States. The State of Arkansas permits the production and stocking of diploid grass carp and does not have a permit process to regulate possession of grass carp by the end user. Commercial fish farms are required to obtain a fish farmer permit in order to propagate and sell fish.

The State of Arkansas prohibits the release of native or non-native species into public waters of the State of Arkansas, or for any state, country or province without the written permission of the Chief of Fisheries. State regulations also prohibit the use of grass carp as bait and prohibit the stocking of grass carp into any body of water where ingress into public waters of said fish is not entirely blocked.

3.1.1.2. Illinois

There are two commercial triploid production facilities in the State of Illinois which participate in the NTGCICP. The State of Illinois prohibits the stocking of diploid grass carp and the transportation and stocking of certified triploid grass carp is regulated. A Restricted Species Transportation/Stocking Permit is required for each shipment of certified triploid grass carp and shipments of triploid grass carp must be checked for triploidy by USFWS or by a private lab or company. End users are not required to obtain an additional permit.

Commercial facilities are required to obtain an Aquaculture Facility Permit and can be authorized to possess high ploidy groups of grass carp fingerlings and diploid grass carp broodstock for the purposes of producing certified triploid populations of grass carp for sale. Grass carp producers are required to destroy any diploid grass carp identified during farm level ploidy testing. The State of

Illinois prohibits the release of triploid grass carp into any natural body of water, including glacial lakes, slough potholes, bottom land or backwater lakes, streams, river; water areas know to harbor rare, threatened or endangered animals or plants on the official National or Illinois State list; any State Inventory Natural Area; any State Preserve; or wetland.

3.1.1.3 Alabama

There is one commercial triploid production facility in the State of Alabama which participates in the NTGCICP. The State of Alabama permits the production and stocking of diploid grass carp, does not regulate grass carp transportation of stocking and does not have a permit process to regulate possession of grass carp by the end user. Commercial fish farms are required to obtain a Sale of Pond Raised Gamefish Permit in order to propagate and sell fish. The State of Alabama prohibits the stocking of public waters without written permission from the State.

3.1.1.4 Georgia

There is one commercial triploid production facility in the State of Georgia which participates in the NTGCICP. The State of Georgia prohibits the production and stocking of diploid grass carp, requires certification of triploid grass carp shipments and the transportation and stocking of certified triploid grass carp is regulated. End users are not required to obtain a permit.

Commercial fish farms are required to obtain an Aquaculture Registration and a wild animal license for dealing/breeding regulated fish in order to propagate and sell grass carp. Licensed grass carp producers are permitted to possess diploid broodfish over 5 pounds in accordance with an approved SOP to prevent escape of diploid fish from the facility. Any diploid grass carp between 8 inches and 5 pounds identified during farm level ploidy testing are to be destroyed. The conditions of the permit require the holder to allow Department of Natural Resources agents access to the subject facilities at reasonable times to take blood samples of any grass carp in his/her possession for the purposes of determining if the fish are triploid and otherwise check for compliance with applicable laws, regulations and provisions of the license. A signed bill of sale must be given to each buyer at the time of sale, which has the date, number of grass carp purchased and a certification that each grass carp is triploid. Records required by the Game and Fish Code and the license must provide a clear audit trail which accounts for each fish from the time it comes into the possession of the licensee through its legal disposition or death. The licensee must notify the Special Permit Unit at least 1 day in advance of selling grass carp and must

maintain copies of bills of sale, certificates of triploidy and other records required for a period of 12 months.

3.1.1.5 South Carolina

There is one commercial triploid production facility in the State of South Carolina which participates in the NTGCICP. The State of South Carolina prohibits the stocking of diploid grass carp and the transportation and stocking of triploid grass carp is regulated. A Possession of Non Indigenous Species Permit and a Transportation Authorization is required to transport producer tested triploid grass carp and shipments of triploid grass carp must be checked for triploidy by the State of South Carolina prior to stocking. The State of South Carolina charges a ploidy inspection fee of $1.00 per fish shipped to inspect producer certified triploid grass carp shipments.

Commercial producers are also required to obtain a commercial aquaculture permit and a site specific permit, operate under SOP's from the State regarding containment of diploid fish, and must pass site visits by the State. Permitted producers may possess mixed ploidy populations of grass carp fingerlings and diploid broodfish for the production of triploid populations. Intrastate shipments of triploid grass carp may be certified by the producer and are then inspected by the State prior to sale. Producers are required to issue stocking permits to end users and must submit monthly and quarterly reports of triploid grass carp stockings. The State of South Carolina prohibits the stocking of non-indigenous fish into public waters without permission from the State.

3.1.2 State Regulations concerning non-NTGCICP participating producers

There are 3 commercial producers of triploid grass carp which do not participate in the NTGCICP and they are located in two States. These three producers do not sell USFWS certified lots of triploid grass carp and therefore the regulations imposed on them by their States only contribute to the objective regarding the containment of diploid grass carp and do not contribute to the objective regarding preventing diploid contamination of certified lots of triploid grass carp. The State regulations which govern the activities at these 3 commercial triploid grass carp production facilities to contain grass carp and prevent diploid contamination of certified lots of triploid grass carp are summarized as follows:

3.1.2.1. Florida

There are two commercial triploid production facilities in the State of Florida which do not participate in the NTGCICP. The State of Florida prohibits the stocking of diploid grass carp and the transportation and stocking of certified

triploid grass carp is regulated. Commercial producers are required to obtain a hatchery permit, a holding and possession permit, operate under SOP's from the State regarding containment of diploid fish, and must pass site visits by the State. Permitted producers may possess mixed ploidy populations of grass carp fingerlings and diploid broodfish for the production of triploid populations and intrastate shipments of triploid grass carp may be certified by the producer. End users are required to obtain a stocking permit and producers must submit monthly reports of triploid grass carp stockings.

3.1.2.2 Missouri

There is one commercial triploid production facility in the State of Missouri which does not participate in the NTGCICP. This facility produces diploid grass carp and high ploidy groups of triploid fry and fingerlings for sale to other producers. The State of Missouri permits the production and stocking of diploid grass carp and does not have a permit process to regulate possession of grass carp by the end user. Commercial fish farms are not required to obtain a fish farmer permit in order to propagate and sell fish.

3.1.3 Federal Regulations

The Lacey Act is the only Federal Law which governs the activities of commercial triploid grass carp facilities in the United States. In general terms, the Lacey Act provides that it is a violation of Federal law to transport or possess wildlife (i.e. grass carp) in violation of a State law. A felony Lacey Act violation is punishable by up to 5 years in federal prison and up to a $20,000 fine for each violation.

The Lacey Act also allows the Federal government to list a species as injurious. Injurious species may not be imported into the country or transported between States. Injurious listing does not prohibit the production, sale or stocking of a species within a State's borders if the State allows the species to be produced, sold or stocked.

3.2 Summary of SOPs and BMPs employed by NTGCICP participating commercial triploid grass carp producers

3.2.1 USFWS NTGCICP Standards

The USFWS NTGCICP requires that participating producers meet the following standards with regard to the testing, holding and inspecting lots of triploid grass carp for certification:

-The USFWS only provides the Inspection and Certification service to producers that want to cooperate and sign an MOA.

-The Grass Carp Producer, prior to the inspection date, will examine the checklist of requirements for Triploid Grass Carp Producers, and ensure that the conditions of the protocol will be met and checked off on the Inspection Documentation Form (i.e., available diploid controls, a working Coulter Counter, etc.).

-All grass carp, in an identified lot, offered for sale, will have been individually tested by particle sizer technique and all non triploid fish identified during screening will have been removed before a USFWS Triploid Grass Carp Inspection will be performed. The USFWS Inspection consists of a retesting by the Producer, in the presence of the Inspector, of 120 individuals randomly selected by the Inspector from the identified lot of alleged 100 percent triploid grass carp.

-Producers must have a fully operational particle sizer (such as the Coulter Counter) with channelizer, and trained personnel available to process fish for the Inspection**.** A fully operational particle sizer shall be defined as one where the modal peak for triploid screened fish is at least one channel to the right of a 2.8 micron bead modal peak. The diploid control modal peak will be two standard deviations to the left of a 2.8 micron bead modal peak.

-The Grass Carp Producer will provide the diploid grass carp control fish. The fish will be the same relative age/size as the group of fish that are to be certified for triploidy. As an option, 2.8 micron polystyrene beads may be used as a standard to calibrate when diploids are unavailable at the time of the inspection.

-The Grass Carp Producer will maintain the isolated Lot(s) of allegedly 100 percent triploid grass carp in containment units at least 100-ft. away from production ponds and at least 6 ft away from tanks holding untested/Diploid Grass Carp to reduce the chance of inadvertent mixing of triploids and diploids.

-All tanks in the containment facility will be clearly labeled as either untested, diploid, producer tested triploid or USFWS certified Triploids.

-Containment units must be provisioned with water that is clear enough to allow the isolated fish population to be viewed by the USFWS Inspector for the purposes of visually estimating fish numbers and confirming the absence of other species whose presence would indicate potential adulteration of screened fish. In the event the water in the holding tanks is not clear enough due to a unique weather event or temporary equipment malfunction the inspector will offer to work with the producer to find an acceptable alternative method of determining the disposition of fish in the containment unit.

-Upon the arrival of the inspector the producer will provide the inspector with the Inspection Documentation Form with the table of tank locations and number of alleged 100 percent triploid fish completed and pre-inspection

checklist completed. The producer will randomly select 120 fish under the supervision of the inspector. The producer may not pre select 120 fish prior to the arrival of the inspector.

-The grass carp producer will analyze diploid controls or beads on their particle sizer under the supervision of the inspector to ensure that their particle sizer is fully functional prior to conducting an inspection.

-The grass carp producer will then individually retest all 120 randomly selected fish from the alleged 100% triploid lot under the supervision of the inspector. Each sample will be channelized under the direction of the inspector. The channelizer reading from at least every 10^{th} sample will be manually recorded by the inspector on the Inspection Documentation Form. Each individual fish will be secured in an identifiable location for possible retesting if suspected of being diploid. The fish can be released to the general triploid population after the inspector confirms the ploidy status of all 120 fish.

-If a blood sample results in a questionable reading when it is channelized the producer will follow the facility protocol for screening a suspect sample under the direction of the inspector. At the very least the protocol will contain the following elements:

> -Pour original sample into new, clean cuvette and retested up to two times. If Ok continue with inspection.
>
> -When suspect sample is present producer stops operation without communicating location of fish to bleeding crew.
>
> -Inspector notes location of suspect fish and retrieves all suspect fish in a containment unit (i.e. Two fish in a net) and returns to the sample stand.
>
> -Collect new blood sample in a new, clean, acuvettes from all fish in group up to two times
>
> -Run samples and make determination of ploidy of new blood samples.

-The inspection will be failed if the inspector observes any non-triploid fish. In the event of a type A failure (a diploid is found in the course of testing the 120 fish sample) the lot fails inspection and cannot be certified. All fish in that lot of fish must be individually retested, by the Producer, before another inspection can be rescheduled.

-In the event of a type B, C or D failure, the standard for which the producer was out of compliance must be corrected prior to scheduling another inspection.

The inspector must indicate in writing using the standardized letter the reason for the failure so that the producer can correct the problem.

-A lot is defined as the number of fish recently individually screened by the producer to remove non triploid fish and held in isolation which may potentially be shipped within 6 calendar days. The inspector will calculate the number of fish permitted to be certified and sold from this lot as the number of fish identified in certificate requests by the producer at the time of inspection plus 30% to be potentially shipped in the next six days. The inspector records the number on the Inspection Documentation Form. An arbitrary maximum number of 6,000 fish per lot is being assigned until empirical data on actual diploid incidence rates in failed lots can be reviewed and a more accurate statistical model applied to the historical data to establish higher or lower lot sizes based on the 120 fish sampling protocol. Multiple inspections can be performed in a day to accommodate larger orders.

-The lot of alleged 100% triploid fish is inspected by the USFWS Inspector. If they pass inspection, the inspected lot of fish is held in isolation. Certificates may be issued by the inspector for up to 6 calendar days on fish sold from the inspected lot. If fish are added to the inspected lot the certifications on remaining fish from the inspected lot are null and void. Fish must pass re-inspection before they can be certified and sold.

-Any fish from the inspected population of fish not sold within six calendar days of inspection must be re-inspected and pass inspection before new certificates can be issued for shipment/sale. Unsold fish from the previous lot may be pooled with producer tested 100 % triploid fish to form a new lot for USFWS inspection. Fish from the old lot are not to be mixed with the newly checked fish until USFWS inspection is passed.

-The producer is responsible for organizing delivery of certificates written after the inspector leaves the producer's site on the day of the inspection. This can be accomplished in several different ways depending on the urgency of the request (1) mailed by regular mail, (2) sent via courier service using the producer's charge code, (3) picked up by the producer at a location convenient for the inspector.

-If visual examination by the Inspector identifies some phenotypic anomaly, further scrutiny and investigation would not be the responsibility of the Inspector under the Grass Carp Program. If such work is desired by the Grass Carp Producer, it should be directed to a fish veterinarian, a certified fish health specialist, or a fish pathologist.

-Grass Carp Producers will retain records of their Certification transactions for 7 Years and provide original, embossed, Certificates to truck drivers, and others, delivering the fish to the place of destination.

-The USFWS provides triploidy certification; it is the obligation of the producer to comply with laws, regulations, and guidelines of the States.

-Fees for service will be handled by check, issued to the Inspector at the time of the Inspection or by other agreed terms with the USFWS, and made payable to the U.S. Fish and Wildlife Service for the number of fish Certified to be shipped.

-The Grass Carp Producer will not directly participate in the selling of grass carp as USFWS certified triploid grass carp in intrastate and interstate shipments without valid USFWS certificates.

-The Grass Carp Producer must not be convicted of a felony lacey act violation related to the triploid grass carp business.

-The Grass Carp Producer will not falsify any certificates or documents. Number of fish on certificate must match number of fish on invoice/bill of lading**.**

3.2.2 Producer initiated SOPs and BMPs

In addition to the standards for producers of the NTGCICP, one producer has written SOPs or BMPs employed at their facilities to contain grass carp and prevent diploid contamination of **certified** lots of triploid grass carp. The other participating producers employ verbal SOPs or BMPs for this purpose. These additional SOPs and BMPs cover a wide range of topics from screening facility outflows in accordance with State regulations, broodstock management hatchery procedures to prevent the escape of eggs or fry, farm level ploidy testing, oversight for loading fish onto delivery trucks, removing untested grass carp from other species of fish, checking permits prior to stocking and general administrative actions to meet the record keeping requirements of the States. The written SOP/BMP collected can be found in appendix A.

3.3 Discussion

Commercial triploid grass carp producers are regulated by diverse State regulations regarding the containment of grass carp and the prevention of diploid contamination of certified lots of triploid grass carp. The Federal Government has very little regulatory authority over commercial triploid grass carp producers and this authority is restricted by States rights. NTGCICP participating producers are required to follow strict written standards in order to obtain certificates of ploidy for their triploid grass carp shipments and most employ verbal SOPs or BMPs regarding the operation of their facilities.

4 Objective 2-NTGCICP: Preventing the shipment of diploid grass carp

4.1 The NTGCICP's authority is to 1) provide third party inspection and certification services to participating producers to assure participating States that shipments of certified triploid grass carp do not contain diploids within the confidence level of the program and 2) to collect fees for that service. The inspection and certification process is governed by standards which participating producers must follow in order for shipments to qualify for certification. These standards are amended periodically with input from the participating producers and recently standards for non-compliance fees were developed to provide incentive for greater quality control within the program.

The effectiveness of the NTGCICP in preventing the shipment of diploid grass carp is difficult to report statistically as there are several interpretations of the data depending on an individual's understanding of the program. First, we must recognize that the purpose of the NTGCICP is not to prevent shipments of diploids but rather to prevent the shipment of diploids in lots of certified triploid grass carp which originate from participating producers and terminate in participating States which require certification. This is accomplished by inspections and random sampling to ensure lots of triploid grass carp meet the standards of the program prior to shipment. The NTGCICP was not intended to and does not prevent the shipment of diploid grass carp within States that do not require certification or States that do not prohibit the production, transport, sale and stocking of diploid grass carp.

Second, the best measure of the effectiveness of the NTGCICP at preventing the shipment of diploid grass carp in lots of certified triploid grass carp may be the results of random sampling by receiving States from shipments of certified triploid grass carp. There are however three significant problems with this measure of effectiveness:

1) The NTGCICP does not have authority over shippers/distributors and once a lot of certified triploid grass carp leaves the control of the participating producer the authority of the NTGCICP ends. Receiving States which authorize the shipper/distributor bear the burden of preventing shipper/distributors from potentially adulterating certified lots of triploid grass carp and may regulate them as such through the revocation of required permits/licenses if a shipper/distributor is found to be in violation of State regulations.

2) States which conduct random sampling of certified triploid grass carp shipments often do not share the results of the sampling with the NTGCICP.

3) There is no standard protocol being used for testing the ploidy of grass carp randomly sampled from shipments of certified grass carp by receiving States. Furthermore, very few State agencies or university labs have the equipment or

knowledge to analyze grass carp for ploidy. The following examples demonstrate recent instances of questionable ploidy analysis at the State level:

a) A State submitted grass carp samples to a university lab which used chicken blood as a diploid control.

b) A State submitted randomly collected grass carp from a certified shipment to a university lab which recently lost one of its live grass carp controls and did not know whether they had lost the diploid control or the triploid control. The lab concluded that all of the grass carp submitted by the State were diploid. The State contacted the participating producer from which the shipment originated and threatened to revoke their permit for shipping diploids. The producer convinced the State to send the live grass carp which had been collected to the USFWS inspector which had issued the ploidy certificate. The inspector received the live grass carp and analyzed them on coulter counters at two other commercial grass carp producers. All of the samples indicated the fish were triploid. The inspector then analyzed the grass carp using the coulter counter of the producer from which the shipment originated. All of the samples indicated the fish were triploid. The State did not revoke the producers permit.

c) A State submitted grass carp samples to a university lab which grouped the samples and analyzed them using a flow cytometer which gave them a percentage of triploid cells rather than a percentage of triploid fish in the sample.

d) A State stopped a shipper/distributor which was legally carrying both diploid and certified triploid grass carp in separate tanks destined for different States. The State agent sampled both tanks and concluded that the shipment of certified fish was only 80% triploid.

e) A State violated procedure and sampled a lake after it was stocked with certified triploid grass carp rather than sampling the shipment prior to release. Using a university lab the State determined that the shipment of grass carp was only 50% triploid. The State collected another sample from the lake and using the same university lab determined that the shipment was now 80% triploid.

f) A State randomly sampled a shipment of certified triploid grass carp and attempted to analyze the grass carp using an antiquated, surplus particle sizer which had been discontinued by the manufacturer decades ago and could no longer be properly serviced.

Third, we must recognize that the only data available regarding diploid grass carp within the NTGCICP is that concerning the number or percentage of 100%

farm level tested lots from which a diploid fish was identified during the random sampling of the inspection process. This data can be misleading as the identification of a diploid fish during an inspection is a success for the NTGCICP in that it prevented a shipment of grass carp which did not meet the standards of the program from being shipped. A 100% farm level tested lot of grass carp from which a diploid has been identified during inspection does not receive certification and cannot be shipped as a certified shipment. The lot must therefore be 100% individually retested and pass a subsequent inspection in order to receive certification required for shipment. Critics of the NTGCICP often misinterpret the inspection failure rate as being the percentage of certified lots which contain diploids or the percentage of fish in a certified lot that are diploid. Neither interpretation is correct given that no lot found to contain a diploid can receive certification.

Over the last ten years, the NTGCICP inspection and certification process conducted 2,812 inspections and prevented 33 lots of grass carp which did not meet the standards of the program from entering the certified triploid supply chain. During that time, the NTGCICP issued ploidy certificates for 13,727 shipments totaling 4,960,413 certified triploid grass carp shipped. Beginning August 1, 2010, new standards were adopted by the NTGCICP to improve quality control during 100% farm level testing by participating producers. Following the adoption of the new standards the NTGCICP inspection and certification process conducted 931 inspections and prevented 6 lots of grass carp which did not meet the standards of the program from entering the triploid supply chain. During that time, the NTGCICP issued ploidy certificates for 4,808 shipments totaling 1,625,100 certified triploid grass carp shipped.

Following the changes to the NTGCICP in 2010, participating producers improved their triploid induction procedures to minimize the number of diploid fish which enter their ploidy testing labs. This was done in an effort to further reduce the risk of human error, failed inspections and subsequent non compliance fees. Participating producers report populations of grass carp on their farms prior to 100% farm level testing currently contain less than 1% diploids (99% triploid prior to 100% farm level testing). Statistical analysis of the 120 fish random sample size used by the NTGCICP indicated that if a participating producer did not individually test 100% their fish prior to NTGCICP inspection and their untested populations of grass carp contained only 99.6 to 99.9% triploids, the producer would fail 27% of their inspections. Furthermore, untested populations containing only 99% triploids would fail 60% of inspections if they were not 100% farm level tested prior to inspection (Glennon and Kelly 2012). Since August 1, 2010, only 0.64% of all 100% farm level tested lots of grass carp inspected have failed NTGCICP inspections indicating that participating producers are meeting the standards of the NTGCICP with regard to 100% farm level testing and that incidental failure of inspections is likely the result of simple human error. Thereby inspection failure rates

have no bearing whatsoever on the incidence rate of diploid fish in certified lots of triploid grass carp.

There is a great deal of misunderstanding concerning the NTGCICP, its purpose, its authority, the confidence level of the random sampling used and interpretation of the certificate and certification process. States which participate in the NTGCICP believe that the program is very effective at preventing the shipment of diploid grass carp in lots of USFWS certified triploid grass carp shipments.

5 Objective 3-Commerical Fish Haulers: Prevent contamination and prohibited introductions

5.1 SOPs and BMPs to prevent contamination of diploid fish in triploid shipments

Almost no commercial fish hauler has a written SOP or BMP to prevent contamination of diploid fish in triploid shipments unless it is part of a written permit provided by the State. Commercial fish haulers operate their facilities and trucks with verbal SOPs or BMPs which are taught to employees during training. In general:

5.1.1 Trucks hauling both triploid and diploid fish isolate each into separate tanks on different sides or ends of the truck. Shipments containing both diploid and triploid fish are rare. Loading diagrams for each shipment will indicate which tanks contains which fish and copy is maintained by the driver. Commercial haulers operating multiple trucks in multiple States usually only haul one type of grass carp.

5.1.2 Most shipments involve unloading all of the fish in the shipment prior to returning home. In the event the truck returns home with grass carp, the fish are unloaded into a holding facility or returned to the producer for credit before loading another shipment of fish.

5.1.3 In the event a grass carp is detected unknowingly mixed with another species of fish which is loaded onto a truck containing a separate tank of certified triploid grass carp, the grass carp which was found to be mixed are picked out and destroyed.

5.2 SOPs and BMPs to prevent introduction of diploid or triploid grass carp in water bodies where they are prohibited.

Almost no commercial fish hauler has a written SOP or BMP to prevent introduction of diploid or triploid grass carp in water bodies where they are prohibited unless it is part of a written permit provided by the State. Commercial fish haulers operate their facilities and trucks with verbal SOPs or BMPs which are taught to employees during training. In general:

5.2.1 Commercial haulers which are contracted by a participating producer are given instructions and contact information for the individual the producer has arranged for them to meet at the stocking location. All necessary permit requirements or stocking arrangements are coordinated by the producer prior to shipment. The contact individual for the stocking (Agency or Private) is responsible for showing the commercial hauler where to stock the fish.

5.2.2 Commercial haulers which are not contracted by a participating producer are responsible for making sure the grass carp they are stocking are not being

introduced into a water body where they are prohibited. The method for doing so will vary with the receiving State and the condition of their permit/license from the State. For example: The State of Indiana requires that the seller/shipper physically stocks the grass carp into the pond of a customer purchasing the fish and therefore can check and record the address of the pond. The State of Illinois does not require the seller/shipper to physically stock the grass carp into the pond of the customer purchasing the fish and most seller/shippers package the fish into plastic bags for the customer to take home from an advertised store or Conservation District office. Therefore in Illinois the commercial hauler has to trust the information provided by the customer regarding the location of their pond.

5.3 Discussion

The activities of commercial fish haulers are regulated by the receiving State and any SOP or BMP related to preventing the contamination of diploid fish in triploid shipments and preventing the introduction of diploid or triploid fish in water bodies where they are prohibited would depend on the regulations of the receiving State.

6 Objective 4- State inspection, regulation and enforcement of certified triploid shipments

6.1 Inspection (Some data from HDR draft)

Only 13 of the 27 States which require certification of triploid grass carp shipments report that they inspect shipments. Most inspections consist of checking permits and proof of certification. Very few States randomly sample fish in a shipment for ploidy.

6.1.1. Scheduled Inspections

The States of Florida and Illinois conduct scheduled inspections of certified triploid grass carp shipments whereby the Producer/Shipper/Distributor is notified prior to shipping that their shipment will be inspected at a pre determined time and place.

The regulations of the State of Illinois specify tolerances for diploids in a shipment- "All shipments of triploid grass carp are subject to further ploidy testing on a random basis by the State of Illinois determined at the time of permit issuance. If no more than one diploid is found in a shipment, the diploid will be destroyed and another sample will be taken. If no more diploids are found the shipment is allowed to continue. If more than one diploid is found in a shipment, the Conservation officer may confiscate the vehicle transporting the fish destroy the fish, seek revocation of the fish dealer's license and the violator will be subject to the Lacey Act".

6.1.2. Random Inspections

The States of Florida, Georgia, Indiana, Kentucky, Louisiana, New Mexico, New York, Ohio, Oklahoma, Texas, Virginia and Wyoming conduct random inspections of certified triploid grass carp shipments whereby the Producer/Shipper/Distributor is not notified that their shipment will be inspected.

6.1.3. No inspections

The States of Arizona, California, Connecticut, Delaware, Idaho, Nevada, New Jersey, North Carolina, Oregon, Pennsylvania, South Dakota, Washington and West Virginia do not conduct any type of inspection of certified triploid grass carp shipments.

6.2 Regulation (Some data from HDR draft)

State regulation of certified triploid grass carp shipments is varied and be characterized as follows:

6.2.1. End user/Stocking/Possession permit

The States of Arizona, California, Connecticut, Delaware, Florida, Idaho, Louisiana, Nevada, New Jersey, New Mexico, Oregon, Pennsylvania, South Dakota, Texas, Virginia, Washington and Wyoming require the end user to obtain a permit to stock or possess certified triploid grass carp.

Some States inspect the stocking site prior to issuing a stocking permit. Some States require screening prior to issuing a stocking permit.

6.2.2. Importation Permit/Notification Prior to Importation

The States of Connecticut, Georgia, Idaho, Illinois, Nevada, New Mexico, South Dakota, Texas and Virginia require an importation permit or notification prior to shipment of certified triploid grass carp.

6.2.3. Producer/Shipper/Distributor/Sales permit

The States of Arizona, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Kentucky, Louisiana, North Carolina, Ohio, Oklahoma, Pennsylvania, South Dakota, Texas and West Virginia require producers, shippers or distributors to obtain a sales, transport or possession permit for certified triploid grass carp.

6.2.4. No permit

Of the States which require certified triploid grass carp, none do not require a permit of some kind in order to transport, stock, sell or possess certified triploid grass carp.

6.2.5. Record Keeping-Retain records

The States of Florida, Georgia, Illinois, Indiana, Kentucky, Louisiana, Ohio, Pennsylvania and Texas require producers/shippers/distributors to retain records of certified triploid grass carp shipments.

6.2.6. Record Keeping-Submit reports

The States of Florida, Illinois, Indiana, Kentucky, Louisiana and Ohio require producers/shippers/distributors to report certified triploid grass carp shipments.

6.2.7. SOP/BMP's required

The States of Florida, Illinois, North Carolina, Oklahoma, Oregon and Texas require producers/shippers/distributors to operate under written SOPs or BMPs regarding certified triploid grass carp shipments.

6.2.8. Accept USFWS Certification Only

The States of, Connecticut, Florida, Georgia, Idaho, Indiana, Kentucky, New Jersey, New York, Oklahoma, Oregon, Pennsylvania, Texas, Virginia, Washington, West Virginia and Wyoming require producers/shippers/distributors to have certification from USFWS NTGCICP for certified triploid grass carp shipments.

6.2.9. Accept USFWS Certification and other certifications

The States of Arizona, California, Connecticut, Delaware, Illinois, Louisiana, Nevada, New Mexico, North Carolina, Ohio, and South Dakota require producers/shippers/distributors to have certification from either the USFWS NTGCICP or from a public or private lab for certified triploid grass carp shipments. The States of Florida and Georgia will accept certification from producers for intrastate shipments of triploid grass carp. The State of Louisiana must approve any lab other than the USFWS NTGCICP which is to certify triploid grass carp before a certification can occur.

6.3 Enforcement (Some data from HDR draft)

Only 9 of the 27 States which require certification of triploid grass carp shipments report enforcement of certified triploid grass carp shipment regulations.

California, Florida, Georgia, Illinois, Indiana, Kentucky, Louisiana, New Mexico and New York report enforcement activities regarding certified triploid grass carp shipments.

7 Objective 5- State Rationale, regulations and regulatory implementation

7.1 Rationale (Data from HDR draft)

7.1.1. States which prohibit all grass carp

The HDR draft reports that States which prohibit all grass carp had the following rationale for their regulations:

-Grass carp were determined to be more detrimental that beneficial

-Grass carp did not prefer the vegetation which needed to be controlled

-Climate was not conducive for beneficial weed control

-Inter-specific competition for food with invertebrates and other fishes

-Desire to minimize changes to the composition of native and healthy macrophyte, phytoplankton and invertebrate communities

-Grass carp waste was thought to cause spikes in algae or non-preferred plankton

-There are plenty of approved chemicals for aquatic macrophyte control

-Desire not to use non-native species to control native plants

-Regulations were formed before the triploid production process was perfected

-Grass carp were considered detrimental to restoration efforts of native grasses

-Desire to prevent impacts to native recreational and commercial fish species

-Existing waters are relatively disease free with few invasive species

-Concerns over escape into, stocking of or transfer to public waters

-First hand accounts of issues encountered with grass carp

-Grass carp thought to interfere with reproduction of other fishes

- Grass carp thought to decrease refugia and habitat for other fishes

-Grass carp may carry parasites and disease potentially transmissible to native fishes

-Consider paperwork to track ploidy and efforts to control grass carp too problematic when triploids were allowed

7.1.2. States which allow triploid grass carp

The HDR draft reports that States which allow only triploid grass carp had the following rationale for their regulations:

-Recognize the need for vegetation control

-Only allow grass carp for vegetation control in closed systems

-Triploids are considered less expensive than chemicals for vegetation control and there is little risk of reproduction

-Triploids are sterile and will not cost money to control

-Allowing triploids will prevent damage to habitat from reproducing grass carp

-Triploids are an inexpensive form of weed control

-Requiring triploids protects native species

-Prohibiting all grass carp would encourage diploid grass carp to be brought in illegally.

-USFWS requires that no diploids are stocked to preserve the native species and threatened and endangered species in a particular area

7.1.3. States which allow diploid grass carp

The HDR draft reports that States which allow diploid grass carp had the following rationale for their regulations:

-Diploids have been present for a long time without posing problems in State

-Usefulness for nuisance vegetation control far outweighs detriments

-Feral grass carp populations provide revenue for commercial fisherman

-Provide source of food

-Diploid grass carp are cheaper than triploids

-Costs to change the regulation to triploids would be high

-State tried to prohibit diploids but private industry objected

-Habitat not conducive to natural reproduction

-Reduces herbicide use and are more effective than herbicides

-Grass carp increase access for use of shoreline by reducing vegetation

-Stocking occurs in impoundments which do not allow grass carp to reproduce

-Requiring triploids would impact the availability of obtaining fry rather than fingerlings

-State could not convince surrounding States to change to triploids as could not justify changing if surrounding States did not

-The State used triploids for years and didn't feel there was less impact on the environment

-The majority of feral populations of Asian carp are other species

-State biologists do not have issue with diploids

7.2 Regulations (Some data from HDR draft)

7.2.1. Prohibit all Grass Carp

Alaska, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, New Hampshire, North Dakota, Rhode Island, Vermont and Wisconsin prohibit the production, possession, sale or stocking of all grass carp.

7.2.2. Require certified Triploid Grass Carp

Arizona, California, Connecticut, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Kentucky, Louisiana, Nevada, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, South Dakota, Utah, Virginia, Washington, West Virginia and Wyoming allow only triploid grass carp and require certification for all triploid grass carp shipments. Colorado allows triploid grass carp on the western half of the State and requires certification for all triploid grass carp shipments.

7.2.3. Require triploid grass carp but do not require certification

Kansas, Tennessee and South Carolina allow only triploid grass carp but do not require certification. South Carolina requires all shipments to be tested by the State upon entry for a $1.00 per fish fee.

7.2.4. Allow diploids

Alabama, Arkansas, Hawaii, Iowa, Mississippi, Missouri and Nebraska allow diploid grass carp. Colorado allows diploid grass cap on the eastern half of the State.

7.3 Implementation

Implementation of State regulations regarding grass carp production, shipping and sale is varied. Many States lack the budgets and personnel to inspect shipments, issue permits or conduct site visits. Most triploid regulations are implemented with permitting for producers or sellers; some of which require producers and sellers to issue stocking permits, maintain records of grass carp stockings or notify the State of shipments prior to importation.

8 Objective 6- Sources and Pathways by which diploid grass carp may enter triploid supply chain

8.1 Production Sources and Pathways

Diploid grass carp would likely only enter the triploid supply chain through production activities by commercial grass carp producers who do not participate in the USFWS NTGCICP as the last step in the production process for USFWS certified triploid grass carp is testing, inspection and certification which will be discussed in the next section. Therefore, production activities which would cause diploid grass carp to enter the triploid supply chain would only occur on non participating farms which sell triploid grass carp to States which do not require USFWS certification. Kansas, Tennessee, and South Carolina do not require USFWS certification. Florida does not require USFWS certification for intrastate shipments and Georgia does not require USFWS certification for shipments from Florida or Alabama. Without the requirement for USFWS certification, triploid grass carp shipments are not subject to the standards of the USFWS NTGCICP which govern the manner in which grass carp populations are housed and tested at a producer's facility. This lack of standards would allow diploid grass carp to enter the triploid supply chain through any of the following production activities, most of which are related to housing of grass carp prior to sale:

8.1.1 -housing diploid or untested grass carp in close proximity to triploid grass carp

8.1.2.-housing diploid or untested grass carp without adequate measures to prevent fish from being moved around the facility by predators and or by employees/customers who might pick up a diploid or untested grass carp off of the floor after it jumped out of a tank and unknowingly toss it into a tank of triploids

8.1.3-selling diploid or untested grass carp without testing them for ploidy

8.1.4-failing to remove diploid or untested grass carp from another species of fish prior to sale such as catfish, gamefish or baitfish

8.1.5-housing diploids or untested grass carp without adequate labeling/signage to notify employees which tanks contain diploid or untested fish and which tanks contain triploid fish

8.1.6-failing to have or enforce SOPs and BMPS or failing to educate employees as to SOPs and BMPs meant to prevent the contamination of triploid populations with diploids

8.2 Triploid Certification Sources and Pathways

Due to the standards of the USFWS NTGCICP which participating producers are required to comply with and the stringent quality controls employed by producers, it is highly unlikely that a diploid would enter the triploid supply chain by any means other than human error, incompetence or sabotage. The following triploid certification activities (including holding after inspection) could be subject to either:

8.2.1-the particle analyzer experienced technical difficulties during farm level testing and USFWS inspection and both the USFWS inspector and the facility employee failed to detect the faulty reading

8.2.2-an employee failed to remove an identified diploid from the population during farm level testing prior to inspection, the facilities quality control measures (video cameras, multiple witness SOPs and random sampling of lots prior to inspection) failed to detect the error and the random sample size used during the USFWS inspection was insufficient to catch the lone diploid in the large lot

8.2.3-a disgruntled employee or competitor puts diploids into a tank of certified triploids after the lot has been inspected and the facilities' quality control measures (video cameras, security measures) fail to detect or prevent the addition

8.2.4-an employee fails to follow facility SOPs or BMPs and loads untested fish onto a truck rather than certified fish due to improper signage or incompetence and the facilities' quality control measures (video cameras and oversight) fail to detect the error

8.2.5-an employee fails to follow facility SOPs or BMPs and does not remove untested fish from other species prior to loading the other species of fish onto a truck which also contains certified triploids and the facilities' quality control measures (oversight) fail to detect the error

8.2.6-an employee fails to follow facility SOPs or BMPs and houses diploid fish or untested fish in close proximity to certified triploids after the fish have been inspected and a diploid or untested fish jumps out of its tanks and is picked up off the floor by an incompetent employee or unwitting customer and is tossed into the tank of certified triploids and the facilities' quality control measures (video cameras and oversight) fail to detect the addition

8.3 Shipping Sources and Pathways

Diploid grass carp could enter the triploid supply chain through shipping activities primarily if the shipper/distributor purchases multiple fish species from multiple commercial producers or a shipper/distributor hauls both diploid and certified triploid fish on the same truck at the same time.

8.3.1-a shipper/distributor purchases certified triploid grass carp from a NTGCICP producer and then purchases catfish which contain a few diploid grass carp from a non NTGCICP producer. When the shipper/distributor finds the grass carp in the catfish they pick them out and add them to their tank of certified triploid grass carp

8.3.2-a shipper/distributor purchases certified triploid grass carp from a NTGCICP producer and then legally purchases diploid grass carp from another producer. The shipper/distributor adds the diploids to their tank of certified triploid grass carp and sells them all as certified triploids.

8.3.3-a shipper/distributor intends to sell fish at feed stores in eastern Missouri on Tuesday and western Illinois on Wednesday. The shipper/distributor legally purchases diploids and Illinois certified triploids from a NTGCICP producer on Monday and puts them into separate tanks on their truck. While on the road selling fish in Missouri on Tuesday the shipper/distributor accidently mixes the tanks of grass carp and continues to sell the mixed fish as certified triploids in Illinois on Wednesday.

8.3.4-a shipper/distributor operates two trucks. One truck sells diploids in Alabama and the other truck sells certified triploids in Kentucky. After being on the road all week both trucks return home to Mississippi and unload the unsold fish into their holding facility. Over the weekend a fish jumps out of the diploid tank and is picked up by an employee and is unknowingly tossed into the tank of certified triploids which returned from Kentucky and whose certificate has expired. Several days later the shipper/distributor loads the tank of triploids onto his truck and travels to Tennessee to sell the triploids which are no longer certified (and do not need to be because the State of Tennessee does not require USFWS certification).

8.3.5-a shipper/distributor with an expired triploid certificate from a previous triploid shipment to Oklahoma legally purchases diploid grass carp from a producer and transports them to Oklahoma to sell them. If the shipper/distributor is not stopped and inspected by the State of Oklahoma the shipper/distributor is able to sell the diploids as triploids. If the shipper/distributor is stopped by the State of Oklahoma there is a 50/50 chance

that the State agent will realize that the certificate is expired and turn the shipment around. Conversely there is a 50/50 chance that the agent will not realize that the certificate is expired and allow the shipment to continue.

8.4 Stocking Sources and Pathways

It is highly unlikely that stocking activities would result in diploid grass carp entering the triploid supply chain because stocking is the end of the triploid supply chain. The following examples would be the only imaginable ways the stocking of a diploid could result in a diploid entering the triploid supply chain:

8.4.1-The State of Missouri legally stocks diploid grass carp within its waters and one diploid fish or its offspring swims into Illinois and is picked up by birds and dropped into a tank containing certified triploids at a commercial facility after it has been inspected by NTGCICP.

8.4.2-The State of Arkansas legally stocks diploid grass carp into its waters and a distributor with an expired triploid certificate seines the diploid fish or their offspring out of the wild and transports the fish into Louisiana, Texas or Oklahoma and sells them as triploids and is not stopped and checked by State enforcement agents in the receiving State.

8.4.3-A diploid grass carp legally stocked in Lake Erie in the 1970's spawned during a 500 year July high water event and one of its offspring was picked up by a bird and dropped into a tank containing certified triploids at a distributor's facility in Pennsylvania or Ohio.

8.5 Discussion

The greatest likelihood that a diploid would end up in the triploid supply chain would occur through the shipping activities of a rouge shipper/distributor or through the production activities of a non NTGCICP participating commercial producer operating in a State that does not require USFWS certification and does not require or provide oversight or SOPs/BMPs regarding farm level testing. The greatest threat to the triploid supply chain is rouge shippers/distributors that willfully violate State law with regard to the possession and sale of triploid grass carp. The next greatest threat to the triploid supply chain would be distributors which possess both triploid and diploid fish on the same truck or shared facility without appropriate safeguards to prevent contamination.

Increased State oversight and enforcement activities would be the most effective means by which to prevent diploids from entering the triploid supply chain. Furthermore, the risk posed to the triploid supply chain by States which currently allow the stocking of

non certified triploid grass carp could be eliminated if those States changed their regulations and required NTGCICP certification of fish in their triploid supply chain.

9 Objective 8-Regulations, procedures, total numbers and disposition of legal diploid grass carp produced, shipped and stocked by commercial and state facilities

9.1 Summary of Regulations (Some data from HDR draft)

The States of Alabama, Mississippi, Arkansas, Missouri, Iowa, and Nebraska allow the legal production of diploid grass carp by commercial producers and State facilities. State regulations prohibit the release of any fish into public waters without the written permission of the State. It is legal to transport, sell and stock diploid grass carp in Alabama, Mississippi, Arkansas, Missouri, Iowa, Nebraska, Hawaii, and the eastern half of Colorado. Special permits, in addition to an aquaculture or dealer permit, for production, importation, possession, transportation, sale or stocking of diploid grass carp are not required by the States of Alabama, Mississippi, Arkansas, Missouri, Iowa, and Nebraska. Colorado requires an importation permit for all fish imported into the State.

9.2 Summary of Procedures (Some data from HDR draft)

With the exception of the States of Colorado there are no special procedures concerning legal diploid grass carp production, shipping and stocking by commercial and state facilities. Colorado requires diploids be housed separately from triploids destined for the western half of the state.

9.3 Summary of Total numbers (Some data from HDR draft)

Very little data is available concerning the number of legally stocked diploid grass carp. Most States which allow for the stocking of diploid grass carp have no reporting requirements and most commercial producers and shippers/distributors were unable to share sales records. Arkansas, Iowa and Missouri stock an average of 36,000, 33,000 and 23,000 diploid grass carp per year respectively from State facilities. Mississippi stocks an average of 16,000 grass carp from untested mixed ploidy populations annually. There are commercial diploid grass carp production facilities in Arkansas, Alabama, Missouri, Nebraska and Iowa.

9.4 Summary of Disposition (Some data from HDR draft)

Legally stocked diploid grass carp from commercial and State facilities are predominantly stocked into ponds and lakes for vegetation control. Research and foodfish production account for a very small percentage of legally stocked diploid grass carp.

9.5 Discussion

States which allow the legal production, shipping and stocking of diploid grass carp require minimal regulation and oversight of these activities. Very little data is available concerning the number and disposition of legally stocked diploid grass carp.

10 Objective 7- Recommendations to reduce risk of unintended introductions of **diploid grass carp**

10.1 Producers

10.1.1 Producers should be required by their States to obtain a permit or license for commercial fish production or sale activities from their state.

10.1.2 A generic example SOP/BMP should be drafted and producers should be required by their States to implement a SOP/BMP for the production, holding and sale of grass carp as a condition of their state permitting or licensing. Producers should be subject to annual site visits by state regulatory personnel to ensure compliance. At a minimum the SOP/BMP should outline procedures for screening outflows, labeling tanks, preventing the mixing of diploid and triploid fish and knowing State regulations as they pertain to grass carp stocking.

10.1.3 A generic example record keeping form should be drafted and producers should be required to maintain stocking and sales records as a condition of their state permitting or licensing. Producers should be subject to annual site visits by state regulatory personnel to ensure compliance. At a minimum the form should indicate the number, ploidy, name and address of customer and name of receiving state.

10.2 Inspection programs USFWS

10.2.1 The USFWS NTGCICP should draft, implement and fund a formal quality control process by which States receiving shipments of certified triploid grass carp may send them grass carp removed from randomly inspected shipments of certified grass carp for quality control testing. Grass carp removed from a shipment during a random inspection should be sent to the inspector who signed the ploidy certificate and the grass carp tested for ploidy using the equipment of the participating producer from which the shipment originated. This process should not be an extension of law enforcement activities of the State, rather a quality control check on the triploid grass carp supply chain as the participating producer has no control over the certified triploid grass carp once they leave their facility. In the event diploid fish are discovered in a shipment of certified triploid grass carp, every effort shall be made using a formal process to identify the manner (i.e. human error vs adulteration) in which the diploid fish entered the triploid supply chain so that appropriate corrective or preventative actions may be taken. Participating producers should be directly involved in the development of this process. Non-compliance fees collected by the NTGCICP may be an appropriate source of funds to implement such a process.

10.2.2 The USFWS NTGCICP should implement a sliding scale sample size to be used in the event a participating producer fails a ploidy inspection or a diploid fish is identified and documented in the triploid supply chain originating from their facility by an NTGCICP inspector through random sampling by a State if the shipment never left the control of the producer. After such an event a participating producer should be required to use an elevated sample size during a predetermined number of successful subsequent inspections to demonstrate adequate quality control. After successfully passing those subsequent inspections using the elevated sample size the producer may return to the lower, normal sample size for NTGCICP inspections.

10.2.3 The USFWS NTGCICP should require as a condition of their MOA that participating producers 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 as to the extent of State laws regulating their activities require.

10.2.4 The USFWS NTGCICP should consider revising the Ploidy Release Authorization (Triploid Certificate) to more accurately reflect the intent of the program which is often misconstrued by States and Federal regulators. See appendix B.

10.3 Inspection programs States

10.3.1 States receiving shipments of triploid grass carp certified by USFWS should be encouraged to conduct random inspections of certified grass carp shipments and submit the grass carp collected to the inspector who issued the certificate for the shipment. Analysis of the randomly collected grass carp should be conducted at the facility of the participating producer from which the shipment originated under the supervision of the inspector who issued the certificate. This process should not be an extension of law enforcement activities of the State, rather a quality control check on the triploid grass carp supply chain as the participating producer has no control over the certified triploid grass carp once they leave their facility. In the event diploid fish are discovered in a shipment of certified triploid grass carp, every effort shall be made using a formal process to identify the manner in which the diploid fish entered the triploid supply chain so that appropriate corrective or preventative actions may be taken.

10.3.2 States receiving shipments of triploid grass carp certified by USFWS should be encouraged to report the findings of random inspections of certified triploid grass carp shipments to the USFWS NTGCICP. Reported findings should include the number of the certificate which accompanied the shipment, the name of the

shipper/distributor whose shipment was inspected, the date and the number of fish determined to be in the shipment. If a State conducts ploidy analysis of fish removed from a randomly inspected shipment of certified triploid grass carp the occurrence of diploid fish identified should be reported and samples from any diploid grass carp identified submitted to the inspector who issued the certificate for the shipment.

10.4 Shippers/Distributors

10.4.1. Shippers/distributors should be required by receiving States to obtain a permit or license for shipping or sale activities.

10.4.1 A generic example SOP/BMP for the possession and sale of both diploid and triploid grass carp should be drafted and shippers/distributors should be required by States to implement a SOP/BMP as a condition of their state permitting or licensing. Shippers/distributors States should also be subject to annual inspections by state regulatory personnel to ensure compliance. At a minimum the SOP/BMP should outline procedures for screening outflows, labeling tanks, preventing the mixing of diploid and triploid fish, the transport of both diploids and triploids on the same truck and knowing State regulations as they pertain to grass carp stocking.

10.4.2 A generic example record keeping form should be drafted and shippers/distributors should be required by States to maintain stocking and sales records as a condition of their state permitting or licensing. Shippers/distributors should also be subject to annual inspections by state regulatory personnel to ensure compliance. At a minimum the form should indicate the number, ploidy, name and address of customer and name of receiving state.

10.5 States

10.5.1 States should be encouraged to cease the stocking of 100% diploid grass carp in State waters and the production of 100% diploid grass carp at State facilities, with the exception of diploid broodfish used to make triploid grass carp.

10.5.2 All States which currently allow the production, sale and distribution of diploid grass carp should be encouraged to limit the possession of live non certified grass carp to properly permitted or licensed commercial aquaculture facilities and prohibit the sale of live non certified grass carp to individuals or companies which are not properly permitted or licensed commercial aquaculture facilities.

10.5.3 All States which currently allow the production and sale of grass carp should be encouraged to require commercial fish producers and distributors to obtain a permit or license from the State to conduct commercial fish production or sale activities. States should be encouraged to require grass carp producers and distributors to implement a generic SOP/BMP for the production, holding and sale of grass carp as a condition of their state permitting or licensing. States should be encouraged to require grass carp producers and distributors to maintain stocking and sales records using a generic record keeping form as a condition of their state aquaculture permitting or licensing. States should be encouraged to conduct annual site visits by State regulatory personnel to ensure compliance.

10.5.4 All States which allow the possession and sale of triploid grass carp should be encouraged to amend the language of their regulations to read: "No person shall import, transport and/or purchase grass carp to be stocked unless such fish are from a lot of 100% individually tested grass carp which has been inspected and certified by the USFWS NTGCICP or another competent authority approved by the State and are accompanied by a certificate as such." This language more accurately reflects the nature of ploidy inspection and certification, allows States to authorize others to perform the inspection and certification in the event USFWS is no longer able or willing to provide the service and ensures that if another authority is used all lots have been 100% individually tested prior to inspection and certification.

11 Conclusion

The Nationwide Regulation, Production, Triploid Certification, Shipping and Stocking of Grass Carp is governed by diverse State regulations with very little inter-jurisdictional coordination. Within the Mississippi River Basin it is legal to produce, transport sell and stock diploid grass carp, non certified triploid grass carp and certified triploid grass carp. Several States currently stock diploid grass carp into State waters while surrounding States permit only the possession and sale of USFWS certified triploid grass carp and require a grass carp permit to be purchased by the end user prior to stocking.

Several States within the Mississippi River Basin are concerned with the spread of feral populations of grass carp. Many regulators wish to see efforts made to prevent diploid grass carp from entering the triploid supply chain or to restrict the distribution of diploid fish. If such a coordinated effort is to be made, the States of Arkansas, Missouri, Iowa, Colorado, Nebraska, Mississippi and Alabama should be encouraged to change their regulations concerning the production, possession and sale of diploid grass carp. This effort must be made at the State level as listing the diploid grass carp as injurious at the Federal level will not prevent commercial grass carp producers or State facilities within those States from continuing to produce, sell and stock diploid grass carp within their State's borders. Injurious listing of grass carp would serve only to further criminalize an activity which most States fail to adequately regulate through enforcement.

In addition to States which permit the possession and sale of diploid grass carp, the greatest potential for the spread of diploid grass carp and threat to the triploid supply chain is through non regulation of shippers/distributors at the State level. Lack of oversight and failure to enforce existing State regulations through random inspections creates an environment for potential abuse.

The NTGCICP is an independent third party providing quality control to participating States and producers using standardized protocols. The NTGCICP is an effective tool for preventing diploid fish from entering the triploid supply chain within those States which require USFWS certification of triploid shipments. The authority of the NTGCICP is limited to 1) offering inspection and certification services to participating producers who require them to in order to comply with regulations of participating receiving States and 2) collecting reasonable fees for those services. Attempts to broaden the scope of the NTGCICP beyond its current authority would do little to improve its effectiveness at preventing diploid fish from entering the triploid supply chain considering the limitations of State regulations and their enforcement. The ability of the NTGCICP to prevent the shipment of diploid fish does not benefit States which do not participate in the program and the potential of the NTGCICP to help reduce the spread of diploid fish is undermined in the Mississippi River basin by States which allow the distribution and sale of diploid grass carp.

The majority of recommendations contained within this report concern changes to current State regulation, inspection and enforcement of the grass carp supply chain. Short of requiring these changes by the States as a condition of Federal Sportfish Restoration Act Funding, the Federal Government's authority to effectively regulate the grass carp supply chain on a national level is limited by State's rights. At best the USFWS can encourage States to make the recommended changes and provide them with the suggested regulatory language, written examples of effective SOPs and BMPs and record keeping forms. The recommendations made concerning changes to the NTGCICP should be relatively easy to implement, serve to provide further third party quality control of triploid grass carp shipments and greater assurance to the receiving States that the shipments of certified fish do not contain diploids.

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Appendix A.

Recommended changes to the USFWS NTGCICP certificate

Seal Agency Seal

Triploid Grass Carp Certificate

Certificate Number: 2009TRIPLOID**00002**

Statement of Ploidy Inspection

On the day of _____(1)____, _____(2)____fish were randomly selected from a lot of ____(3)_____ 100% individually ploidy tested fish identified as inspection# _____(4)___and were inspected for ploidy on a farm site particle sizer. Diploid controls/uniform polystyrene beads and channelizer readout were used to ensure proper readings from the equipment prior to inspection of the lot. Observations from the inspection showed all standards for producers were met and the results on the random sampling found no diploids. According to the National Standards established for the Triploid Grass Carp Certification Program, all certificates issued on this lot of triploid grass carp expire six calendar days following the date of this inspection. Therefore this and all certificates issued from this inspection expire at midnight on ____(5)___.

Inspector Name_____(6)_____ Inspector Phone Number_____(7)_____

Inspector Signature_____(8)_____ Inspector Address_____(9)_____
(name and signature of Inspector must be embossed in order for certificate to be valid)

Statement of Sale/Shipment

_____(10)_____ USFWS Certified triploid grass carp from this inspection are hereby sold to:
(name)_____(11)_____
(address)_____(12)_____
on the date of _____(13)__ _____to be:
(14) Shipped to purchasers location for distribution or further sales in the State of_____(15)__
(16) Sold from a truck at various locations within the State of _____(17)_____
(18) Stocked for pond, lake, waterway management within the State of_____(19)_____

Statement of Ploidy Release Authorization

I hereby authorize the USFWS grass carp ploidy inspector to release the results of the ploidy inspection to the State of _____(20)_____.

Producer Name_____(21)___ Producer Phone Number_____(22)_____

Producer Signature_____(23)___ Producer Address_____(24)_____
(name and signature of Producer must be embossed in order for certificate to be valid

Approval to Decrease Number of Fish Shipped

Number of fish shipped_____(25)_____ Producer Signature_____(26)_____

Approval to decrease number of fish shipped requires embossing with producer seal and changed certificate must be faxed to state representative and grass carp inspector prior to departure.

Instructions for Triploid Grass Carp Certificate

1. Inspector enters the date the inspection took place.
2. Inspector enters total number of 100% individually producer tested grass carp collected in the random sample.
3. Inspector enters total number of 100% individually producer tested grass carp held in isolation from which the random sample was taken from. This is the lot size.
4. Inspector assigns and enters a sequential inspection number for this lot of fish.
5. Inspector enters the expiration date of the certificate. This is six calendar days from the date of inspection.
6. Inspector prints inspector's name.
7. Inspector enters inspector's phone number by which a receiving state can contact the inspector to confirm validity of certificate if questioned.
8. Inspector signs certificate (Inspectors printed name and signature must be embossed by inspector).
9. Inspector enters inspector's address should a State agent desire to ship sample to them from an inspection of a shipment which entered their State.
10. Producer enters number of certified fish in shipment
11. Producer enters name of distributor/customer purchasing the fish.
12. Producer enters the complete address of the distributor/customer.
13. Producer enters the date the shipment leaves the participating producers facility.
14. Producer checks here if the fish are being shipped to the purchaser's location for further sales.
15. Producer enters the State in which the fish are to be distributed if number 14 is checked.
16. Producer checks here if the fish are being sold at various locations.
17. Producer enters the State in which the fish are to be distributed if number 16 is checked.
18. Producer checks here if the fish are being stocked directly for pond/lake/waterway management
19. Producer enters the State in which the fish are to be stocked if number 18 is checked.
20. Producer enters the State to which the producer is authorizing the inspector to release the results of the inspection.
21. Producer enters the name of the participating producer who owns the facility at which the inspection is taking place.
22. Producer enters the participating producer's phone number by which a receiving state can contact the producer to confirm validity of certificate if questioned.
23. Producer signs certificate (Producers name and signature must be embossed by producer).
24. Producer enters address of producer.
25. Producer enters the number of fish sold in this shipment if the number of fish shipped is decreased from the number indicated on line 10.
26. Producer signs the certificate if they have decreased the number of fish shipped. The signature must be embossed.
27. All certificates must be faxed by the Inspector to the receiving State prior to the shipment leaving the producer's facility. In the event the number of fish shipped is decreased, the producer must fax the changed certificate to both the inspector and the receiving State representative prior to the shipment leaving the producer's facility.

Appendix B.

SOP/BMP Provided by J.M. Malone and Son, Inc.

Spawning/Triploid Induction

1) All activities concerning broodstock and the hatchery facility will be supervised by a manager.
2) Diploid grass carp identified during farm level ploidy testing are stocked into earthen production ponds which are managed to grow aquatic vegetation for the purposes of feeding the grass carp. The standpipe of each pond is screened to prevent the escape of any fish.
3) In the spring of the year, diploid grass carp no less than 3 years of age are gathered from the production ponds and stocked into small 1 or 2 acre holding ponds under the supervision of a farm manager. The standpipe of each pond is screened to prevent the escape of any fish.
4) The holding ponds are fed daily with fresh cut green grass.
5) During the months of May, June and July groups of diploid grass carp are brought to the grass carp hatchery for spawning.
6) Under the supervision of a farm manager, a holding pond is seined with a ½ inch mesh net and the diploid grass carp broodstock are tranquilized with Quinaldine sulfate.
7) The hatchery manager selects four to eight males and females based on secondary sexually characteristics. The selected males and females are placed into separate hauling tanks for transport to the hatchery.
8) Once the diploid grass carp broodstock arrive at the hatchery, they are tranquilized using quinaldine sulfate and hand carried into the hatchery under the supervision of the hatchery manager. Each fish is individually weighed and tagged before placed into the broodstock holding tank. Females and males are held at separate ends of the broodstock holding vat separated by a divide placed in the middle of the broodstock holding tank and held in place with weights.
9) The broodstock holding tank is supplied with airstones for aeration and heated, filtered well water to maintain the water temperature between 76 and 80 degrees Fahrenheit.
10) The covers of the broodstock holding vat containing the diploid grass carp broodstock will be in the lowered position at all times except when the tank is being cleaned daily and when the broodstock are receiving injections or are being spawned. At such times the covers will be raised using the hand crank on the wall.
11) The floor drains in the aisle next to the broodstock holding tank are covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall while being handled. The drain pipe on the downstream end of the broodstock holding tank is screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the broodstock holding vat will remain in place at all times except when the tank is being cleaned daily, the tank is being flushed to remove tranquilizer or the tank is being dewatered for disinfection. Prior to removing the

drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or discarded in the mort bucket. Prior to removing the drainpipe to de water the broodstock holding tank, any fish remaining in the holding vat will be removed and transported to the diploid holding tanks in the testing lab or discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.

12) During the placement of broodstock grass carp in the broodstock holding tank, the diploid grass carp broodstock are given an injection of HCG to begin the process of egg maturation and induced spawning. Approximately 24 hours after the first injection the diploid grass carp broodstock are given a second injection of HCG to continue the process of egg maturation and induced spawning. Approximately 24 to 36 hours after the second injection the diploid grass carp broodstock are given a third injection containing carp pituitary to finish the process of egg maturation and induced spawning.
13) Eight hours following the last injection the diploid grass carp broodstock are tranquilized and the females are individually checked for readiness to spawn. If the females are not ready to spawn the holding tank is flushed with fresh water and left alone for one hour before the fish are tranquilized and checked again for readiness to spawn. Once the females have reached the proper state of readiness, spawning can begin. The spawning and triploid induction process is done on an individual female basis. Only one female is spawned at a time. Eggs from multiple females are not mixed. The spawning and triploid induction process for a given female is completed before another female is spawned.
    a) Once a female is ready to spawn, a cloth bag is placed over the females head and the fish is lifted from the water. The fish is dried with paper towels and the eggs are hand stripped into a large, dry plastic bowl. Following spawning, the female is returned to the broodstock holding tank and the bowl of eggs is covered and placed onto a bench in the hatchery.
    b) A male is selected and a cloth bag is placed over its head and the fish is lifted from the water. The fish is dried with paper towels and the milt is hand stripped into a glass measuring cup. Milt from two males is collected into the same measuring cup. Following stripping the males are returned to the broodstock holding tank and the measuring cup containing the milt is covered and placed on a bench in the hatchery.
    c) The eggs are then measured equally into two to five large, dry plastic bowls and placed on the bench. The milt is measured equally into each of the bowls containing eggs.
    d) Each bowl of eggs is individually fertilized, water hardened and treated to induce triploidy on an individual basis. Only one bowl of eggs is fertilized, water hardened and treated to induce triploidy at a time. The fertilization, water hardening and triploid induction process is completed for a given bowl before another bowl can be fertilized.
    e) The milt is mixed with the eggs in a given bowl and is activated by adding a measured volume of tempered water to the bowl. Two stop watches are started

the instant the water is added to the bowl. Additional measured volumes of tempered water are added to the bowl at preset intervals.

f) At the appropriate time interval post fertilization, the excess water is poured off of the fertilized eggs into an empty bucket and the fertilized eggs are poured into the triploid induction apparatus.
g) The eggs remain in the triploid induction apparatus for a preset time interval and then they are poured into numbered incubation tanks.
h) Each incubation tank holds treated, fertilized eggs from a given bowl. Groups of treated, fertilized eggs are not mixed in incubators. Every bowl of eggs is placed into a separate incubator following fertilization and triploid induction.

Incubation/Fry Ploidy Testing

1) Incubation occurs in 65 gallon fiberglass conical bottom tanks. Filtered, heated well water is supplied to each incubation tank through an overhead de gassing and distribution tank. Water is introduced to the bottom of the incubation tank through a pipe with holes cut around its circumference to allow for equal distribution of flow. The water flows from the bottom of the tank in an upward direction gently rolling the treated, fertilized eggs concentrated in the conical bottom of the tank.
2) Each incubation tank has two drains through the side of the tank near the top. Each drain is screened modular "filters" which are covered in saran cloth having openings of less than 350 microns. Water flowing out of the incubation tanks through the modular filters travels down plastic hoses into a pvc drain pipe which flows into a floor drain. The end of the pvc drain pipe is fitted with a filter bag.
3) Each incubation tank also has a bottom drain which is plugged with a wooden dowel from inside the tank. A hose is attached to the outside of the bottom drain and extends to the top of the incubation tank and is held in place with plastic cable ties to prevent it from falling over.
4) Treated, fertilized eggs are incubated in the upwelling current of the incubation tanks for 24 hours before they begin to hatch. Incubation tanks are treated twice daily with formalin to prevent fungus.
5) Once hatching has begun, an air line is introduced to the bottom of the incubation tank and air is used to circulate the hatching eggs and newly hatched embryos in an upwelling current. Newly hatched grass carp are semi buoyant and would settle to the bottom of the incubation tanks and suffocate if the upwelling current created by the air flow was not present.
6) During the incubation process the modular screens are checked no less than every 2 hours to ensure they are not clogged with eggs shells or fungus which would cause the incubation tanks to overflow. If a modular screen begins to clog it is either turned, scrubbed or replaced with a new, clean modular screen. If the modular screen is replaced it is done in a manner to prevent any escape of eggs are fry.
7) Three days post hatch a sample of fry is taken from each incubation tank and tested in two replicates for each incubation tank using a flow cytometer. Groups of fry from different incubators are not mixed for ploidy testing.
8) The results of the flow cytometry indicate the approximate percentage of triploid fry in each incubation tank. Incubation tanks containing lots of fry comprised of less than 99% triploids are destroyed with bleach under the supervision of a farm manager. Incubation tanks containing lots of fry comprised of greater than 99% triploids are stocked into nursery ponds four days post hatch under the supervision of a farm manager.

Stocking/Nursery

1) Incubation tanks containing groups of high ploidy grass carp fry to be stocked are drained under the supervision of a farm manager to a volume of approximately 10 gallons using a siphon hose drawing water through a saran screen.
2) The wooden dowel plug at the bottom of the incubation tank is removed and the hose attached to the outside of the bottom drain is cut loose from the cable tie which is holding it in place at the top of the incubation tank.
3) As the hose is lowered from its position a farm manager plugs the end of the hose with a finger. The fry and water remaining in the incubation tank is drained through the hose into multiple plastic bags. Once the incubation tank is empty the plastic bags containing the fry are filled with air and sealed with rubber bands.
4) The bags containing the lots of high ploidy grass carp fry are then transported to prepared nursery ponds in the bed of a truck under the supervision of a farm manager. The nursery ponds had been dried several weeks prior and refilled with well water within one week of stocking. The standpipe on the nursery ponds is elevated above the top of the levee and tied in position.
5) The bags containing the lots of high ploidy grass carp fry are then tempered at the water's edge and the fry are released into the nursery pond under the supervision of a farm manager.
6) Each nursery pond will receive fry from an individual female. Fry from multiple females are not mixed in nursery ponds. Fry from multiple incubation tanks from the same female may be mixed in nursery ponds if the ploidy of each incubation tank is similar.
7) The high ploidy grass carp fry remain in the nursery ponds for 1 to 12 months.
8) At two weeks post stocking fingerlings from each nursery ponds are sampled individually using a coulter counter to determine the ploidy of each nursery pond. Nursery ponds containing lots of grass carp fingerlings comprised of less than 98% triploids are destroyed under the supervision of a farm manager.
9) All activities within the nursery ponds and hatchery will be supervised by a manager.

Fingerling Harvest

1) Beginning 1 to 2 months post stocking nursery ponds are harvested using an 1/8 inch mesh seine under the supervision of a farm manager.
2) Untested high ploidy groups of fingerlings are netted from the seine and transported to hauling tanks in five gallon buckets.
3) The transport tanks carry the untested high ploidy fingerlings to the holding facility and where they are piped into a holding tank.
4) The covers of the holding vat containing the untested high ploidy lots of grass carp fingerlings will be in the lowered position at all times except when the tank is being cleaned daily and when the fingerlings are being handled. At such times the covers will be raised using the hand crank on the wall.
5) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tanks will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place at all times except when the tank is being cleaned daily or the tank is being dewatered for disinfection. Prior to removing the drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or discarded in the mort bucket. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
6) All activities within the nursery ponds and holding facility will be supervised by a manager.

Fingerling Stocking

1) After 1 to 2 days of purging the groups of untested high ploidy fingerlings are sampled by blood testing 120 to 300 individual fish by means of a coulter counter. The sampling determines the average ploidy of each group and identifies size gradients within each group which could be graded from the group to improve the ploidy of the group.
2) If the ploidy of a group is less than 99% or cannot be graded up to 99% the group of fingerlings is destroyed under the supervision of a farm manager.
3) If necessary the group is graded to improve the ploidy or to reduce size variation.
4) One day following grading the group of high ploidy untested fingerlings is loaded into hauling tanks and transported to growout ponds under the supervision of a farm manager. Each group is counted and weighed so that the appropriate number of fingerlings is stocked into each pond.
10) The growout ponds have been previously drained, dried, disked and refilled using either well water or filtered pond water from an adjacent growout pond. The standpipe on the growout ponds is elevated above the top of the levee and tied in position.
5) The fingerlings in the hauling tanks are tempered on the levee by exchanging water from the growout pond being stocked with the water in the hauling tanks.
6) Once tempering is complete the fingerlings are piped into the growout ponds under the supervision of a farm manager.

Marketable Fish Harvest

1) Beginning 2 to 3 months post stocking groups of marketable size untested high ploidy grass carp are ready for harvest.
2) Under the supervision of a farm manager, bait is placed in the corner of a growout pond and a ¾ inch seine is used to catch marketable size untested high ploidy grass carp for a specific order.
3) The fish are tranquilized using quinaldine sulfate and transported to hauling tanks in 20 gallon plastic tubs.
4) The fish are placed into the hauling tanks and transported to the holding facility.
5) The transport tanks carry the untested high ploidy grass carp to the holding facility where they are piped into a holding tank.

Holding lots of untested high ploidy marketable grass carp

1) The covers of the holding vat containing the untested high ploidy lots of grass carp will be in the lowered position at all times except when the tank is being cleaned daily and when the fish are being handled. At such times the covers will be raised using the hand crank on the wall.
2) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tanks will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place at all times except when the tank is being cleaned daily or the tank is being dewatered for disinfection. Prior to removing the drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or discarded in the mort bucket. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
3) All effluents from the holding facility will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
4) No untested high ploidy group of grass carp will be held in a holding tank adjacent to any holding tank containing 100% producer tested triploid grass carp or 100% certified triploid grass carp.
5) Any grass carp found on the floor of the holding facility shall be discarded in the mort bucket. No grass carp found on the floor of the holding facility is to be returned to any holding vat.
6) All holding vats containing groups of untested high ploidy grass carp or tested or certified grass carp shall be clearly marked as such.
7) All holding vats containing groups of untested high ploidy grass carp or tested or certified grass carp shall be 100 feet from the nearest pond containing untested grass carp and shall be housed in a manner to prevent the movement o f untested fish by animals.
8) All activities within the holding facility will be supervised by a manager.

Moving lots of untested high ploidy marketable grass carp to the testing lab

1) The covers of the holding vat containing the untested high ploidy lots of grass carp to be tested will be raised using the hand crank on the wall.
2) The untested grass carp in the holding tank will be tranquilized using quinaldine sulfate
3) The untested grass carp will be seined to the downstream end of their holding tank at a speed sufficient to prevent spooking the fish causing them to jump out of the holding tank.
4) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tank will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place during the movement of the untested fish. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and transported to the testing lab or discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
5) All effluents from the holding facility and blood testing lab will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
6) The untested grass carp will either be dip netted or hand counted into the crane transport container which will contain enough water to prevent stressing the fish during transport.
7) The overhead crane will carry the crane transport container to the testing lab. The fish will be piped from the crane transport container into lab holding vat C. The crane transport tank shall be operated a safe distance from any holding vat containing tested or certified triploid grass carp sufficient to prevent any fish from jumping out of the crane transport tank and into a holding vat containing triploid or certified grass carp. Any fish which jumps out of the crane transport tank or is found on the holding shed floor shall be discarded in the mort bucket.
8) The covers of the lab holding vat C containing the untested high ploidy lots of grass carp to be tested will be in the lowered position at all times except when the tank is being cleaned daily and when the untested fish are being tested. At such times the covers will be raised using the hand crank on the wall.
9) The floor drains in the aisle between holding tanks in the lab will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tanks in the lab will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place at all times except when the tank is being cleaned daily or the tank is being dewatered for disinfection. Prior to removing the drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or

discarded in the mort bucket. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and transported to the diploid holding tanks in the testing lab or discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.

Farm Level Triploid Testing Prior To USFWS Inspection

1) The covers of lab holding vat C containing the untested high ploidy lots of grass carp to be tested will be raised using the hand crank on the wall.
2) Untested high ploidy lots of grass carp being held in lab vat C will be tranquilized using quinaldine sulfate.
3) The untested grass carp will be seined to the downstream end of their lab holding vat C at a speed sufficient to prevent spooking the fish causing them to jump out of the holding tank.
4) The floor drains in the aisle between holding tanks in the lab will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tanks in the lab will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place at all times except when the tank is being cleaned daily or the tank is being dewatered for disinfection. Prior to removing the drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or discarded in the mort bucket. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and transported to the diploid holding tanks in the testing lab or discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
5) All effluents from the blood testing lab will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
6) The tranquilized lot of untested high ploidy grass carp will be sized by hand using measuring boards. The fish shall be classified as 8 inch minimum, 10 inch minimum and 12 inch minimum. Each fish will be measured, classified and segregated into a division of lab holding vat C.
7) When a segregated size class of untested high ploidy grass carp is to be tested the group is tranquilized using quinaldine sulfate and crowded in a seine.
8) The tranquilized untested high ploidy grass carp are then dip netted or hand counted into a holding pan containing water with quinaldine sulfate housed on a cart with wheels. There are a maximum of three carts in operation at any given time.
9) The carts holding the pans of tranquilized untested high ploidy grass carp are placed next to the pokers at blood sampling station.
10) The poker then picks up individual fish and uses a hypodermic needle mounted into the end of a glass test tube to poke the fish in the isthmus until a bead of blood is drawn. Experienced pokers can accomplish this with one poke.
11) Once a bead of blood is drawn the poker extends their arm slightly towards the pipetter.

12) The pipetter uses a pipette to draw approximately 1ul of blood. The blood sample is then expelled into an accuvettes containing 10 ml of isoton solution with zapoglobin.
13) The accuvette containing the blood sample is placed into a color coded, number coded tray.
14) The fish is placed into a corresponding color coded, number coded floating net.
15) Once all of the spaces on the tray and corresponding floating net are full, the tray is handed to the coulter counter operator.
16) Each accuvette containing a blood sample from an individual fish is placed into the coulter counter and is analyzed. The coulter counter measures the diameter of the red blood cells. The operator ensures that the histogram displayed on the coulter counter has cleared between samples. Once the new histogram for the new sample is displayed the coulter counter operator makes the determination as to whether the sample produces a triploid reading, a diploid reading or an undetermined reading.
17) If the sample is determined to produce a triploid reading the accuvette is removed from the coulter counter and discarded.
18) If the sample is determined to produce a diploid reading, an accuvette containing red liquid is placed in the numbered corresponding location on the tray from which the sample came from. The accuvettes containing the sample is then discarded.
19) If the sample is determined to produce an undetermined reading, the coulter counter operator requests a new sample be taken from the corresponding fish. A lab employee retrieves the fish from the corresponding color coded, number coded floating frame and brings it to a poker. The poker pokes the fish in the isthmus and the pipetter draws a blood sample and expels it into an accuvette containing 10 ml of isoton with zapoglobin. The lab employee who retrieved the suspect fish carries both the fish and the accuvettes containing the new sample to the coulter counter operator. The coulter counter operator then analyzes the new sample. If the sample is determined to produce a triploid reading the fish is returned to its floating net. If the sample is determined to produce a diploid or undetermined reading the fish is placed into lab holding vat A or B.
20) Once all samples on a color coded, number coded tray have been analyzed, a lab employee carries the tray to the end of the lab floating tank. All lab employees stop their assigned tasks and watch the lab employee carrying the tray. The lab employee with the tray then verbally calls out the color and number of each red accuvette on the tray. As the lab employee calls out the location of the red accuvettes, the lab employee removes the corresponding fish from the floating net and places it into lab holding vat A or B. Once all fish corresponding to red accuvettes on the tray have been removed from the tray, the fish remaining on the corresponding floating net are placed into the temporary triploid isolation tank. In the event there are no red accuvettes on a tray, the lab employee verbally calls out the color of the tray followed by the phase “is good”. All lab employees then stop their assigned tasks and watch the lab employee carrying the tray as the lab employee places all of the fish on the corresponding floating net into the temporary triploid isolation tank.
21) Once all untested high ploidy fish from a segregated size class have been individually tested and all fish whose blood samples produced a diploid or undetermined result have been removed

from the lot, a sub sample of 120 fish is taken from the temporary triploid isolation tank. Each of the 120 fish is then individually retested using the same protocol. If all samples from each of the 120 fish produce a triploid reading, all fish in the temporary triploid isolation tank may be transported using the crane to a 100% producer tested holding vat. If any of the samples from each of the 120 fish produce a diploid or undetermined reading, all fish in the temporary triploid isolation tank must be placed back into holding vat C and individually retested using the same protocol.

22) Holding vats containing 100% producer tested fish must be 6 feet from any vat containing diploid or untested grass carp and must display a sign which indicates the vat contains 100% producer tested fish.
23) All activities in the blood testing lab and the holding facility will be supervised by a manager and will be recorded on closed circuit television cameras.

Isolation of 100% Producer Tested Grass Carp

1) The covers of the holding vat containing the 100% producer tested lots of grass carp will be in the lowered position at all times except when the tank is being cleaned daily and when the fish are being handled. At such times the covers will be raised using the hand crank on the wall.
2) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled.
3) The drain pipe on the downstream end of the holding tanks will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place at all times except when the tank is being cleaned daily or the tank is being dewatered for disinfection. Prior to removing the drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or discarded in the mort bucket. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
4) All effluents from the holding facility will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
5) No groups of 100% producer tested grass carp will be held in a holding tank adjacent to any holding tank containing untested or diploid groups of grass carp.
6) Any grass carp found on the floor of the holding facility shall be discarded in the mort bucket. No grass carp found on the floor of the holding facility is to be returned to any holding vat.
7) All holding vats containing groups of 100% producer tested grass carp shall be clearly marked as such.
8) All holding vats containing groups of 100% producer tested grass carp shall be 100 feet from the nearest pond containing untested grass carp and shall be housed in a manner to prevent the movement of untested fish by animals.
9) All activities in the holding facility will be supervised by a manager and will be recorded on closed circuit television cameras.

Triploid Inspection and Certification

1) The lab manager maintains contact with the USFWS triploid grass cap inspector. It is understood that the USFWS inspector is available to conduct inspections on Monday, Wednesday and Friday.
2) When an inspection is needed the lab manager arranges a time with the inspector.
3) Prior to the arranged inspection, the lab manager completes the pre inspection portion of the USFWS Checklist for Triploid Grass Carp inspections and ensures all requirements have been met.
4) Upon arrival at the farm the inspector is presented with the checklist which contains the location and quantity of 100% producer tested lots to be inspected.
5) The inspector indicates how many fish are to be randomly collected from each tank and supervises the collection of the random sample by the lab employees.
6) The inspector then supervises the collection and channelization of blood samples from known diploid grass carp and records the results on the checklist. 2.8 um Beads may be substituted.
7) The inspector then supervises the collection and channelization of individual blood samples from the random sample of 100% producer tested grass carp according to the standards of the USFWS Triploid Grass Carp Ploidy Inspection Program.
8) If all of the randomly sampled fish tested under the supervision of the USFWS inspector are shown to be triploid, the inspection is passed and certificates may be issued.
9) If even one diploid is found among the randomly sampled fish tested under the supervision of the USFWS inspector, the inspection is failed and no certificates may be issued. Every fish in the lots being inspected must be individually retested by the producer before another inspection can be scheduled.
10) Once a lot has passed USFWS inspection the USFWS will issue certificates of inspection indicating that the lot met the requirements of the USFWS inspection and certification program.
11) The inspector will complete the certificate with information provided by the producer. The inspector will sign and emboss the original certificate indicating the lot met the requirements. The producer will sign the original certificate authorizing the inspector to release the certificate to the receiving State. Photocopies of the original certificate will be made. The original will accompany the shipment, one copy will be maintained by the producer and one copy will be maintained by the inspector and faxed to the receiving State.
12) A copy of the checklist will be made. The original will be maintained by the producer, one copy will be maintained by the inspector.
13) See USFWS Standards regarding changes to certificates and expiration of certificates.
14) All activities in the holding facility and blood testing lab will be supervised by a manager and will be recorded on closed circuit television cameras.

Isolation of 100% Certified Triploid Grass Carp

1) The covers of the holding vat containing the 100% certified lots of grass carp will be in the lowered position at all times except when the tank is being cleaned daily and when the fish are being handled. At such times the covers will be raised using the hand crank on the wall.
2) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled.
3) The drain pipe on the downstream end of the holding tanks will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place at all times except when the tank is being cleaned daily or the tank is being dewatered for disinfection. Prior to removing the drainpipe to clean the vat any fish which may be on the downstream side of the drainpipe screen will be removed and placed on the upstream side of the screen or discarded in the mort bucket. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
4) All effluents from the holding facility and blood testing lab will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
5) No groups of 100% certified grass carp will be held in a holding tank adjacent to any holding tank containing untested or diploid groups of grass carp.
6) Any grass carp found on the floor of the holding facility shall be discarded in the mort bucket. No grass carp found on the floor of the holding facility is to be returned to any holding vat.
7) All holding vats containing groups of 100% certified grass carp shall be clearly marked as such.
8) All holding vats containing groups of 100% certified grass carp shall be 100 feet from the nearest pond containing untested grass carp and shall be housed in a manner to prevent the movement of untested fish by animals.
9) All activities in the holding facility will be supervised by a manager and will be recorded on closed circuit television cameras.

100% Certified Triploid Grass Carp Sale

1) The covers of the holding vat containing the certified lots of grass carp to be sold will be raised using the hand crank on the wall.
2) The certified grass carp in the holding tank will be tranquilized using quinaldine sulfate
3) The certified grass carp will be seined to the downstream end of their holding tank at a speed sufficient to prevent spooking the fish causing them to jump out of the holding tank.
4) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tank will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place during the movement of the untested fish. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and transported to the testing lab or discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
5) All effluents from the holding facility and blood testing lab will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
6) The certified grass carp will be dip netted or hand counted into tubs or the crane transport container which will contain enough water to prevent stressing the fish during transport.
7) The overhead crane will carry the crane transport container to the hauling truck. The fish will be piped from the crane transport container into the hauling truck. The crane transport tank shall be operated a safe distance from any holding vat containing tested or certified triploid grass carp sufficient to prevent any fish from jumping out of the crane transport tank and into a holding vat containing triploid or certified grass carp. Any fish which jumps out of the crane transport tank or is found on the holding shed floor shall be discarded in the mort bucket.
8) The tubs will be hand carried to the hauling truck and poured into the hauling truck. The tubs shall be carried a safe distance from any holding vat containing tested or certified triploid grass carp sufficient to prevent any fish from jumping out of the tub and into a holding vat containing triploid or certified grass carp. Any fish which jumps out of the tub or is found on the holding shed floor shall be discarded in the mort bucket.
9) Every customer purchasing 100% certified triploid grass carp which is required by the receiving State to maintain any permit for grass carp must provide a copy of their permit to the sales office prior to purchasing triploid grass carp.
10) Every customer is provided with an invoice which indicates the quantity, size, cost of the triploid grass carp purchased as well as the State for which the triploid grass carp certificate was issued.
11) Every customer is provided with the original embossed triploid grass carp certificate.

12) All activities in the holding facility and sales office will be supervised by a manager and will be recorded on closed circuit television cameras.
13) All records regarding sale of certified triploid grass carp will be kept for a period of 7 years
14) No sale will be finalized if the permit/paperwork/customer is suspect. We reserve to right not to sell fish to anyone.

Diploid (Untested) Grass Carp Sale

1) Holding tanks containing diploid or untested grass carp must be marked as such.
2) Holding tanks containing diploid or untested grass carp must be 6 feet from any tank containing tested or certified triploid grass carp.
3) The covers of the holding vat containing either untested lots of high ploidy grass carp or diploid grass carp to be sold will be raised using the hand crank on the wall. Whenever possible untested lots of high ploidy grass carp will be sold as diploids.
4) The grass carp in the holding tank will be tranquilized using quinaldine sulfate
5) The grass carp will be seined to the downstream end of their holding tank at a speed sufficient to prevent spooking the fish causing them to jump out of the holding tank.
6) The floor drains in the aisle between holding tanks will be covered with grating of an appropriate size to prevent the escape of any grass carp which may jump out of the vat or fall from a net while being handled. The drain pipe on the downstream end of the holding tank will be screened with grating of an appropriate size to prevent the escape of any grass carp. The drainpipe at the downstream end of the holding vat will remain in place during the movement of the untested fish. Prior to removing the drainpipe to de water the holding tank, any fish remaining in the holding vat will be removed and transported to the testing lab or discarded in the mort bucket. No fish shall be permitted to leave the holding vat via the drainpipe.
7) All effluents from the holding facility and blood testing lab will be screened in a manner to prevent any market size grass carp from entering the surrounding waterways. All screens will be monitored by a manager and cleaned/replaced as needed in a manner to prevent any market size grass carp from entering the surrounding watershed.
8) The grass carp will be dip netted or hand counted into tubs or the crane transport container which will contain enough water to prevent stressing the fish during transport.
9) The overhead crane will carry the crane transport container to the hauling truck. The fish will be piped from the crane transport container into the hauling truck. The crane transport tank shall be operated a safe distance from any holding vat containing tested or certified triploid grass carp sufficient to prevent any fish from jumping out of the crane transport tank and into a holding vat containing tested or certified triploid grass carp. Any fish which jumps out of the crane transport tank or is found on the holding shed floor shall be discarded in the mort bucket.
10) The tubs will be hand carried to the hauling truck and poured into the hauling truck. The tubs shall be carried a safe distance from any holding vat containing tested or certified triploid grass carp sufficient to prevent any fish from jumping out of the tub and into a holding vat containing tested or certified triploid grass carp. Any fish which jumps out of the tub or is found on the holding shed floor shall be discarded in the mort bucket.
11) Every customer purchasing diploid grass carp which is required by the receiving State to maintain any permit for grass carp must provide a copy of their permit to the sales office prior to purchasing triploid grass carp.

12) Every customer is provided with an invoice which indicates the quantity, size, cost of the grass carp purchased.
13) All activities in the holding facility and sales office will be supervised by a manager and will be recorded on closed circuit television cameras.
14) All records regarding sale of diploid (untested) grass carp will be kept for a period of 7 years
15) No sale will be finalized if the permit/paperwork/customer is suspect. We reserve to right not to sell fish to anyone.