

**The Identification of Marine Aquaculture
Products and Producers**

Final Report Submitted To:
The Florida Department of Environmental Protection
Bureau of Marine Resource Regulation and Development

DEP CONTRACT NO. MR039

Florida Department of Agriculture and Consumer Services
BOB CRAWFORD, Commissioner

Bureau of Seafood and Aquaculture
Charles C. Thomas, Chief
2051 East Dirac Drive
Tallahassee, Florida 32310

December 12, 1994

Acknowledgements

The Department of Agriculture and Consumer Services is grateful for the opportunity to coordinate and facilitate this project which is designed to develop policy recommendations related to marine aquaculture in Florida. We thank the Florida Legislature and the Florida Department of Environmental Protection for providing funds to support the project. We also thank Harbor Branch Oceanographic Institution for conducting a literature search on techniques for marking marine products, for providing personnel to participate in the process, and for providing a facility to hold the Assembly.

The two day Assembly process required a significant commitment of time and effort by participants, group leaders and recorders. We express sincere thanks to agencies and persons involved for making the Assembly a success. Dr. Pat Bidol served as the Assembly facilitator. The department is thankful for her work in developing a fair process for answering the agenda questions and developing a group consensus. We also thank Dr. Bidol for her work in developing this report.

The Department of Agriculture and Consumer Services is hopeful that the results of this project will be used by the Department of Environmental Protection, the Marine Fisheries Commission and the Florida Legislature to make positive changes to the regulation of marine aquaculture in Florida.

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Rationale / Justification

Diminishing natural stocks have resulted in harvest restrictions for many important marine species in Florida. These restrictions have resulted in a great deal of interest in producing marine products through aquaculture. At the present time, commercial marine aquaculture in the state is limited to the production of hard clams, oysters and live rock on state-owned submerged land leases. Research and pilot scale projects are being conducted in Florida to test the production capability and economics of culturing many other marine products including bay scallops, nassau grouper, queen conch, shrimp, spiny lobster, red drum, snook, sea trout, mullet, marine ornamentals, marine bait species, marine algae, etc.

At the present time, there is no specific license that is required for marine aquaculture in Florida. There is also no comprehensive system of product labeling to allow the identification of marine aquaculture products through the chain of custody. This situation has resulted in enforcement problems for the Florida Marine Patrol and difficulties in gaining exemptions to regulations designed to protect wild fish stocks. In the case of hard clams (*Mercenaria mercenaria*), a minimum size limit exemption for cultured hard clams was granted through a Special Activity License (SAL). The Marine Fisheries Commission has indicated that the SAL is not designed to regulate the normal activities of an industry, and this mechanism is not suitable for future exemptions that will be needed by the aquaculture industry.

Under the current regulatory system, marine aquaculture products are subject to the same season, size, and bag limit restrictions as their wild counterparts. Regulatory changes are needed to allow the development of marine aquaculture in Florida and to facilitate enforcement. This project was completed to provide recommendations related to these changes.

Summary and Recommendations

The Department of Agriculture and Consumer Services entered into a contract, included as *Appendix A*, with the Department of Environmental Protection in June of 1994 to facilitate the development of policy recommendations related to the regulation of marine aquaculture. The department chose to develop these recommendations by holding an Assembly with representation of the seafood and aquaculture industries, the state agencies involved in marine aquaculture, the aquaculture research community, and environmental protection specialists. Several individuals with knowledge of marine aquaculture regulations in other states were also invited to participate in the process. Three individual working groups were formed to independently answer the agenda questions. A list of the participants in each group is included as *Appendix B*.

The American Assembly process was used to answer a series of agenda questions which are included in *Appendix C(1)*. This process, which was developed and initially used by the military, is designed to allow a diverse group to interact equally in solving complex problems. Two primary problem solving techniques were selected for use in answering the agenda questions. A description of each technique is included as *Appendix C(2)*.

Each participant was provided with background information to be reviewed prior to the Assembly. This information included a report entitled "Compilation of Methods for Identifying Marine Products" which was produced by Harbor Branch Oceanographic Institution through a subcontract from the Department of Agriculture and Consumer Services. This report is included as *Appendix C(3)*. Assembly participants were also provided with information about marine aquaculture regulations in the states of Maryland and South Carolina. This information is included as *Appendix C(4)* and *Appendix C(5)*.

Group recorders were asked to write down each answer exactly as it was presented by the participant, and every participant was provided with an opportunity to respond. Questions 1-8 were answered by each group and are included as *Appendix D*. A plenary session was held to allow a consensus answer to be developed on questions 1, 5, 6, 7, and 8. The results of the plenary session are included in the report entitled "Report on Marine Aquaculture Assembly".

Based on the results of the Assembly process, we recommend the following actions be taken by the Florida Legislature and those State agencies involved in the regulation of marine aquaculture:

1. Define "Marine Aquaculture Products" and "Marine Aquaculture Producers" in the Laws of Florida and / or the Florida Administrative Codes as:

Marine Aquaculture Products are derived from marine aquatic organisms that are owned and propagated, grown or produced under controlled conditions. Such products do not include organisms harvested from the wild for depuration, wet-storage, or relay for purification.

Marine Aquaculture Producers are those persons authorized to engage in production and sale of marine aquaculture products.

2. Develop a mandatory marine aquaculture license to be administered by the Florida Department of Environmental Protection. This license could be developed as a separate license or could be added as an endorsement to the existing Saltwater Products License.
3. Develop industry Technical Advisory Committees to interpret the definition of marine aquaculture products and marine aquaculture producers on a case by case basis for the purpose of issuing the marine aquaculture license.
4. Develop a system to identify marine aquaculture products using package labeling and chain of custody records. Product marking and tagging should also be required for species which need special protection.

MARINE AQUACULTURE ASSEMBLY PARTICIPANTS
November 2-3, 1994

* Mr. Tim Adams	Commercial Fishing Industry
Ms. Sheila Barger	Gulfview Marine Wholesaler
Mr. Pat Barker	Select Seafood, Inc.
Dr. Diane Berile	Marine Resources Council
Mr. Mark Berrigan	FDEP-Bureau of Marine Resource Reg. & Dev.
Major Bruce Buckston	Florida Marine Patrol
Mr. Chris Combs	Florida Sea Grant Program
Mr. Leroy Creswell	Harbor Branch-Div. of Aquaculture
Lt. Col. Frank Feliciano	Florida Marine Patrol
Mr. David Heil	FDEP-Bureau of Marine Resource Reg. & Dev.
Ms. Lucy Horsch	Half Shell Farms, Inc.
Mr. John Horsch	Half Shell Farms, inc.
Mr. Alan Huff	FDEP-Marine Research Institute
Mr. Kal Knickerbocker	FDACS-Aquaculture Section
Mr. Ed Mangano	Aquagem Farms. Inc.
Major Alan Marsden	Florida Marine Patrol
Mr. Barry Moore	Half Shell Farms, Inc.
Mr. Rich Murmer	FDEP
Mr. Alan Peirce	FDACS-Seafood and Aquaculture Programs
Mr. Chip Petre	Virginia Shellfish Farmers Association
Mr. Brad Powers	FDACS-Aquaculture and Seafood and Programs
Ms. Wanda Prentis	FDEP
Dr. John Scarpa	Harbor Branch-Div. of Aquaculture
* Mr. Charlie Sembler, Sr.	Sembler & Sembler, Inc.
Mr. Charlie Shelfer	Florida Marine Fisheries Commission
Ms. Darlene Snyder	FDEP
Ms. Leslie Sturmer	Harbor Branch Oceanographic Int.
Mr. William Teehan	Florida Marine Fisheries Commission
Mr. Charles Thomas	FDACS-Bureau of Seafood and Aquaculture
Mr. Jeff Turner	Exotoc Aquaria, Inc.
Dr. David Vaughn	Harbor Branch Oceanographic Institution
Lieut. George Wattendeck	Florida Marine Patrol
Mr. Steve West	Sea and Sky Wholesaler
Ms. Jennifer Wheaton	FDEP-Marine Research Institute
Mr. Jack Whetstone	South Carolina Sea Grant Program
Mr. Keith Zichur	Shellfish Farm Management, Inc.

* Participated only in the first day Group session

REPORT ON MARINE AQUACULTURE ASSEMBLY
November, 1994

Sponsored by

The Florida Department of Agriculture and Consumer Services'
Bureau of Seafood and Aquaculture

Report Prepared by

Patricia Bidol-Padva, Ph.D.

REPORT ON THE MARINE AQUACULTURE ASSEMBLY

INTRODUCTION

The Marine Aquaculture Assembly was held on November 2 and 3, 1994 at the Harbor Branch Oceanographic Institution. It was sponsored by the Florida Department of Agriculture and Consumer Services (FDACS) under a grant provided by the Florida Department of Environmental Protection (FDEP). FDACS sponsored the Assembly to develop recommendations regarding state policy on marine aquaculture and the identification of marine aquaculture products. The assembly recommendations were presented on November 4 at the Florida Aquaculture Association Annual Meeting and Conference. The final assembly report will be submitted to FDEP and the Florida Legislature.

To ensure that the policy recommendations represented the majority opinion of key parties, persons of related disciplines were invited to participate in the assembly. The thirty-six participants represented the perspectives of:

- o Florida's Shellfish and Liverock Aquaculture Industries.
- o Florida's Seafood Producers.
- o Industry Associations.
- o State Regulatory and Support Agencies.
- o Law Enforcement.
- o Marine Aquaculture Research Organizations.

The contract administrator for the Assembly was Alan Peirce of FDACS' Bureau of Seafood and Aquaculture and it was facilitated by Patricia Bidol-Padva, Ph.D. FDACS contracted with Harbor Branch researchers to conduct a literature search on available means of marking and tagging marine products for identification purposes. The literature search, Compilation of Methods for Identifying Marine Products, was developed by John Scarpa, LeRoy Creswell and David Vaughan.

The enclosed Workshop Report reflects the hard work and dedication of the participants. Participants came to the conference well-informed both because of their professional experience and because of the background materials provided to them. The background materials included basic information regarding the identification systems in use in other states with marine aquaculture development and the literature search. In addition to the background materials, the invitation packet included a list of eight questions which the participants addressed at the assembly.

ASSEMBLY GOALS AND OUTCOMES

The Assembly participants engaged in frank and productive discussions regarding the identification of aquaculture products. During the assembly the participants used joint problem-solving approaches which enabled them to achieve the following:

1. A proposed definition of marine aquaculture producers and products.
2. Policy recommendations to facilitate the promulgation of laws and rules pertaining to exemptions from resource regulations based on tagging, labeling, documentation and licensing.

ASSEMBLY PROCESSES

The assembly was opened at a luncheon with welcoming remarks by Mr. Charles Thomas-FDACS' Chief of the Bureau of Seafood and Aquaculture. He cited the contract support provided by Mr. David Heil-Chief of FDEP's Bureau of Marine Resource Regulation and Development.

After the formal welcoming, the participants were briefed regarding the joint problem-solving procedures to be used during the assembly. The participants were asked to answer the eight assembly questions by engaging in joint deliberations in discussion groups and in plenary session.

In order to provide the participants with as much opportunity as possible to exchange ideas and opinions, the initial responses to the eight questions and the development of policy options occurred in three small groups whose members represented industry, agency and research views. Each small group was led by a facilitator and a recorder. The three discussion groups were facilitated by group leaders: David Heil, Kal Knickerbocker and LeRoy Creswell. The responses of individuals was recorded on easel paper by the group recorders: Darlene Snyder, John Scarpa and Rich Murmer.

Each of the three groups answered all of the agenda questions. The responses from each of the work groups were presented to all the participants in plenary sessions. The total group recommendations were crafted after the participants carefully listened to and considered the work of each sub-group. At the end of the first day, the facilitator compiled the results from the first day's break-out sessions. On the second morning the participants were given copies of all the responses generated during the first day.

ASSEMBLY QUESTIONS

In order to fulfil the goals of identifying bonafide marine aquaculture producers and products and developing policies that will facilitate the promulgation of laws and rules pertaining to exemptions from resource regulations based on tagging, labeling, documentation and licensing, the participants answered the following eight questions.

1. What are bonafide aquaculture products and who are bonafide aquaculture producers?
2. What are the benefits of developing a system to identify marine aquaculture products in Florida, and who would benefit from the system?
3. What are the disadvantages of developing a product identification system, and who would oppose the development of such a system?
4. Are any of the product identification systems used in other states applicable in Florida?
5. Determine the advantages and disadvantages of the following alternative techniques for product identification: (Factors such as technical feasibility, economic feasibility and enforceability should be considered).
 - a. Product tagging and marking techniques.
 - b. Package labeling techniques.
 - c. Documentation and chain of custody techniques (i.e. paper trails, notification requirements, etc.).
 - d. Producer identification via licenses or certifications.
6. Can bonafide marine aquaculture products be identified through the alternatives listed in question 5(a-d)?
7. If so, how should this be implemented?
8. Who should pay for the implementation of the system?

PART 1 - RESPONSES BY SUB-GROUP TO ASSEMBLY QUESTIONS

Each of the sub-groups responded to all of the questions. Their responses were shared with each other via a written compilation of the first day's results prepared by the facilitator and by discussions in the closing plenary session. The responses to questions can be used in the promulgation of laws and rules pertaining to the proposed exemptions.

1. What are bonafide aquaculture products and who are bonafide aquaculture producers?

The terms *Marine Aquaculture Products* and *Marine Aquaculture Producers* were independantly defined by each work group. The resulting definitions are included on the first page of Appendix D.

2. What are the benefits of developing a system to identify marine aquaculture products in Florida, and who would benefit from the system?

A. Benefits:

1. Marketing and product promotion.
 2. Facilitates enforcement and eases regulatory concerns.
 3. Quality Control and assurance-consumer right to know regarding product safety and specific product identification.
 4. Enforcement of product segregation.
 5. Protection of natural resource and prevent illegal harvest of wild product and poaching.
 6. Product Pride and Individual recognition of producers.
 7. Genuine Florida grown (product identification).
-
8. Exempt Agricultural product from natural resource regulation.
 9. Ease of enforcement via paper trail and other methods.
 10. Stabilize regulatory system and facilitate regulation.
 11. Comprehensive data base re statistics, research development, management and technology.

B. Who Benefits:

1. Consumers.
2. Growers.
3. Investors.
4. Wholesalers/Retailers.
5. Resource.
6. Submerged Landowners.
7. Regulatory Entities and Support Agencies.
8. Researchers.

3. What are the disadvantages of developing a product identification system, and who would oppose the development of such a system?

Disadvantages:

1. Hassles from increased paperwork and workload.
2. Increased costs to producers and regulators.
3. Reduce potential entry into industry.
4. Technology for marketing (ID).
5. May lead to license.
6. Lead to counterfeits.
7. Increased product liability.
8. Negative impact to industry if bad experience from product.
9. Grouping of individual/producers/tags.

Potential Opponents:

1. Wild Harvesters.
2. Poachers and bootleggers.
3. Relayers.
4. Non-aquaculturalists and commercial fishing industry.
5. Shippers to Florida for import.
6. Wholesalers who obfuscate.
7. Some farmers, producers, retailers and investors.
8. Some consumers.
9. Some regulators.

4. Are any of the product identification systems used in other states applicable in Florida?

1. Genetic markers.
2. Geologic differences (live rock).
3. Proper tagging of containers.
4. Serial number systems.
5. Chain of custody documentation.
6. Forensics.
7. ID tags for individual plants/animals.
8. Covert tags.
9. Biochemical tags.
10. MD-14 digit code required in, or out of state.

5. Determine the advantages and disadvantages of the following alternative techniques for product identification: (Factors such as technical feasibility, economic feasibility and enforceability should be considered).

a. Product tagging and marketing techniques.

Advantages:

1. Ease of enforcement.
2. Ownership Identity.
3. Increased consumer confidence and information.

Disadvantages:

1. Technical feasibility.
2. Prohibitive cost and labor intensive.
3. Product compatibility.
4. Not one tag for all species, not all species can be tagged and certain life stages of species difficult to tag.
5. Defacement of product.
6. Counterfeiting.

b. Package labeling techniques(container tags, serial number tags via bar codes, and customized package/stamps/banding).

Advantages:

1. Less labor intensive.
2. More willing to comply.
3. More compatible with other states.
4. Promotes mass identification.
5. Not harmful to product.
6. More cost effective.
7. Technically feasible and easy for all types.
8. Segregation of aquaculture product from wild.
9. Used for product promotion and marketing.

Disadvantages:

1. Counterfeiting and misrepresentation.
2. Reuse of container.
3. Discriminatory pricing for shipping.
4. Does not end up at consumer.

c. Documentation and chain of custody techniques (i.e. paper trails, notification requirements, etc.).

Advantages:

1. Industry acceptance.
2. Regulatory acceptance.
3. Reduce liability.
4. Increased quality assurance and control.
5. Cost effective and less labor intensive for industry.
6. More accountability and continuity of product ID at any part of chain.
7. Technically simple.
8. Easy for enforcement to check and retain records.
9. Chain of custody should follow thru to retailer.

Disadvantages:

1. Facilitates violation as easy to separate from product or box.
2. Difficulty in notification requirements.
3. More labor intensive for regulatory agency.

d. Producer identification via licenses or certifications.

Advantages:

1. If cost is high keep out fly-by-nighters.
2. Have single license versus multiple licenses.
3. Do away with SAL and SPL.
4. Enforce limited entry.

Disadvantages:

1. If high cost problems for agency.
2. Approaches under 5. A, B and C will not work without license.

6. Can bonafide marine aquaculture products be identified through the alternatives listed in question 5(a-d)?

All marine aquaculture products can be identified using a combination of the alternatives listed in 5 (a-d).

Shellfish and liverock can not be identified using product tagging and marking techniques.

Package labeling techniques and documentation and chain of custody techniques will identify aquaculture products.

Producer identification will identify producer and not product.

7. If so, how should this be implemented?

The groups had a wide range of thoughts regarding the implementation of the product identification approaches.

1. Use most appropriate tag for those species which can be tagged.
2. In addition to package labeling and documentation, some species such as manatee, turtle, alligator, tarpon, snook and sturgeon need tagging.
3. Some think that industry should be self-regulated with oversight.
4. Create a new aquaculture ID system thru lead agency.
5. All species except liverock can be package labeled.
6. The labels should have enforcement data with space left for marketing information.
7. Documentation trip tickets can be modified to include more management data.
8. Regarding the producer licenses or certifications, keep process simple and separate aquaculturists from those with wild products.
9. Consider industry certification with agency oversight.

8. Who should pay for the implementation of the system?

1. Industry particularly if self-regulated with fees based on level of investment and disposition of funds.
2. Government imposed and paid by taxpayers.
3. In reality the consumer pays.
4. Extra dollars should go into research and development, marketing or lobbying.
5. Private and public sector because license protects producers as well as the natural resource.
6. If FDEP implements current system, it would require no additional funds. Full implementation of alternatives would require additional funds.
7. The Marine Aquaculture License should replace SPL and SAL (CAMEL=Certified Aquaculture Mariculture Enforcement License).

PART 2 - RESULTS OF PLENARY SESSION

During the closing plenary session, participants created a consensus definition of the terms "Marine Aquaculture Products" and "Marine Aquaculture Producers". *The creation of the consensus response by participants with diverse viewpoints was a great achievement.* The following definitions can be used as a framework to develop the policies that will facilitate exemptions from resource regulations based on tagging, labeling, documentation and licensing.

Consensus Definitions

Marine Aquaculture Products are derived from marine aquatic organisms that are owned and propagated, grown or produced under controlled conditions. Such products do not include organisms harvested from the wild for depuration, wet-storage or relay for purification.

Marine Aquaculture Producers are those persons authorized to engage in the production and sale of marine aquaculture products.

The following consensus votes were also passed related to questions 6 and 7:

1. A separate marine aquaculture license should be developed in lieu of the SPL and the SAL with acknowledgement that a SAL may be needed under some conditions.
2. The Department of Environmental Regulation should administer the marine aquaculture license.
3. The marine aquaculture license should be mandatory.
4. The license conditions should be developed with the advice of an industry Technical Advisory Committee.

APPENDIX A

DEP CONTRACT # MR039AGREEMENT

THIS AGREEMENT is entered into this 27th day of June, 1994, between the FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (hereinafter referred to as the "Department") and FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES, whose address is 2051 East Dirac Drive, Tallahassee, Florida 32310 (hereinafter referred to as the "Contractor"), to provide "Shellfish Marking and Licensing" services.

In consideration of the mutual benefits to be derived herefrom, the Department and Contractor do hereby agree as follows:

1. The Department does hereby retain the Contractor to perform the "Shellfish Marking and Licensing" services as defined herein, and the Contractor does hereby agree to perform such services upon the terms and conditions set forth in this Agreement and all exhibits and attachments named herein which are attached hereto and incorporated herein by reference.

2. The Contractor shall perform the services in a proper and satisfactory manner as determined by the Department. Any and all such equipment, products or materials necessary to perform these services, or requirements as further stated herein, shall be supplied by the Contractor.

3. The Contractor shall perform as an independent contractor and not as an agent, representative, or employee of the Department.

4. As consideration for the services rendered by the Contractor under the terms of this Agreement, the Department shall pay the Contractor as specified in Exhibit A. All bills for amounts due under this Agreement shall be submitted in sufficient detail for a proper pre-audit and post-audit thereof. All travel and incidental expenses are included in the fixed price amount of this contract.

5. This Agreement shall begin upon execution by both parties and end December 18, 1994, inclusive. This Agreement may be renewed on a yearly basis for a maximum of two (2) years after the initial Agreement period, or for a period no longer than the term of the original Agreement period, whichever period is longer. Renewal of this Agreement shall be in writing and subject to the same terms and conditions of this Agreement. All renewals are contingent upon satisfactory performance by the Contractor and the availability of funds.

6. The State of Florida's performance and obligation to pay under this Agreement is contingent upon an annual appropriation by the Legislature.

7. Pursuant to Section 215.422, F.S., the Department's contract manager shall have 5 days, unless otherwise specified herein, to inspect and approve the services for payment; the Department must submit a request for payment to the Florida Department of Banking and Finance within 20 days; and the Department of Banking and Finance is given 15 days to issue a warrant. Days are calculated from the latter date the invoice is received or services received, inspected, and approved. Invoice payment requirements do not start until a proper and correct invoice has been received. Invoices which have to be returned to a Contractor for correction(s) will result in a delay in the payment. A Vendor Ombudsman has been established within the Department of Banking and Finance who may be contacted if a Contractor is experiencing problems in obtaining payment(s) from a State of Florida agency. The Vendor Ombudsman may be contacted at 904/488-2924 or 1-800-848-3792.

8. In accordance with Section 215.422, Florida Statutes, the Department shall pay the Contractor, interest at a rate of one (1) percent per month, calculated on a daily basis on the unpaid balance, if a warrant in payment of an invoice is not issued within 40 days after receipt of a correct invoice and receipt, inspection, and approval of the goods or services. Interest payments of less than \$1 will not be enforced unless a Contractor requests payment.

9. Each party hereto agrees that it shall be solely responsible for the wrongful acts of its employees, contractors, and agents. However, nothing contained herein shall constitute a waiver by either party of its sovereign immunity and the limitations set forth in Section 768.28, Florida Statutes.

10. This Agreement may be canceled by either party, with or without cause, by giving 90 days written notice to the other party. Said notice shall be sufficient if delivered personally or by certified mail to the address contained herein. In case of cancellation, only amounts accrued to the date of cancellation shall be due and payable.

11. Any and all notices shall be delivered to the parties at the following addresses:

<u>Contractor</u>	<u>Department</u>
<u>Department of Agriculture and</u> <u>Consumer Services</u> <u>2051 East Dirac Drive</u> <u>Tallahassee, Florida 32310</u>	<u>Department Of Environmental</u> <u>Protection, Mail Station 205</u> <u>3900 Commonwealth Boulevard</u> <u>Tallahassee, Florida 32399</u>

12. Pursuant to Section 216.2815, Florida Statutes, all records in conjunction with this Agreement shall be public record and shall be treated in the same manner as other public records are under general law. This Agreement may be unilaterally canceled by the Department for refusal by the Contractor to allow public access to all documents, papers, letters, or other material subject to the provisions of Chapter 119, Florida Statutes, and made or received by the Contractor in conjunction with this Agreement.

13. This Agreement may be terminated by the Department at any time for failure of the Contractor to perform in accordance with the terms and conditions contained herein.

14. David Heil, Bureau Chief or successor is hereby designated the Department's Project Manager for the purpose of this Agreement and shall be responsible for enforcing performance of the Agreement terms and conditions and shall serve as liaison with the Contractor and approve all invoices prior to payment. The Department's Project Manager can be reached at (904) 488-5471.

15. Charles Thomas, Bureau Chief, or successor is hereby designated the Contractor's Project Manager for the purpose of this Agreement and shall serve as liaison with the Department on all technical and financial matters. The Contractor's Project Manager can be reached at (904) 488-0163.

16. It is expressly understood and agreed that any articles which are the subject of, or required to carry out, this Agreement shall be purchased from the corporation identified under Chapter 946, F.S., in the same manner and under the same procedures set forth in Section 946.515(2), (4), F.S.; and for purposes of this Agreement the person, firm or other business entity carrying out the provisions of this Agreement shall be deemed to be substituted for this agency insofar as dealings with such corporation are concerned.

The "Corporation identified" is PRISON REHABILITATIVE INDUSTRIES & DIVERSIFIED ENTERPRISES, INC. (P.R.I.D.E.) which may be contacted at:

P.R.I.D.E.
5540 Rio Vista Drive
Clearwater, Florida 34620-3107
Telephone No.: 813/535-4900

17. The Contractor warrants that he has not employed or retained any company or person, other than a bona fide employee working solely for the Contractor to solicit or secure this Agreement and that he has not paid or agreed to pay any person, company, corporation, individual, or firm, other than a bona fide employee working solely for the Contractor any fee, commission, percentage, gift or other consideration contingent upon or resulting from the award or making of this Agreement.

18. This Agreement has been delivered in the State of Florida and shall be construed in accordance with the laws of Florida. Wherever possible, each provision of this Agreement shall be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Agreement shall be prohibited or invalid under applicable law, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provision or the remaining provisions of this Agreement. Any action hereon or in connection herewith shall be brought in Leon County, Florida.

19. No delay or omission to exercise any right, power or remedy accruing to either party upon breach or default by either party under this Agreement, shall impair any such right, power or remedy of either party; nor shall such delay or omission be construed as a waiver of any such breach or default, or any similar breach or default thereafter.

20. The Contractor recognizes that the State of Florida, by virtue of its sovereignty, is not required to pay any taxes on the services or goods purchased under the terms of this Agreement.

21. This Agreement is neither intended, nor shall be construed, to grant any rights, privileges, or interest in any third party without the mutual written agreement of the parties hereto.

22. The Contractor shall be responsible for all work performed under the terms of this Agreement. The Contractor may subcontract as necessary to perform the services provided that the subcontract has been approved in writing by the Department prior to its execution. It is understood by the Contractor that the Department shall not be liable to the subcontractor for any expenses or liabilities incurred under the subcontract and that the Contractor shall be solely liable to the subcontractor for all expenses and liabilities incurred under the subcontract.

23. No person, on the grounds of race, creed, color, national origin, age, sex, or disability, shall be excluded from participation in; be denied the proceeds or benefits of; or be otherwise subjected to discrimination in performance of this Agreement.

24. In connection with any litigation arising out of this Agreement, the prevailing party shall be entitled to the recovery of its costs and a reasonable attorney's fee.

25. This Agreement is an exclusive contract for services and may not be assigned in whole or in part without the written approval of the Department.

26. This Agreement represents the entire agreement of the parties. Any alterations, variations, changes, modifications or waivers of provisions of this Agreement shall only be valid when they have been reduced to writing, duly signed by each of the parties hereto, and attached to the original of this Agreement.

IN WITNESS WHEREOF, the parties have caused this Agreement to be duly executed, the day and year first above written.

By: Mike Gresham
(Contractor's Signature)

Mike Gresham
(Contractor's Name-Print)

Director of Administration
(Title)

Department of Agriculture and Consumer Services
(Company Name)

2051 East Dirac Drive
(Address)

Tallahassee, Florida 32310
(City, State and Zip Code)

Remittance Address:

Same
(Address)

Same
(City, State, and Zip Code)

By: [Signature]
Secretary's Signature or designee

for Florida Department of Environmental Protection
3900 Commonwealth Boulevard
Tallahassee, Florida 32399

Approved as to form and legality:

[Signature]
Assistant General Counsel, DEP

[Signature]
Contract Administrator, DEP

DEP 14-061 - Revised 7/91

EXHIBIT A

A. Definition, Scope and Quality of Services

1. The Contractor shall be responsible for providing shellfish marking and licensing services to receive compensation for work performed according to criteria listed below:

a) Provide and facilitate a workshop with representatives of all interests of marine shellfish aquaculture marking and licensing. Specific interests must include: marine enforcement, marine regulation, wild marine shellfish industry, aquaculture marine shellfish industry, representation from the Aquaculture Review Council and Aquaculture Interagency Coordinating Council, legislative interests, legal interests in marine policy and rule making, marine shellfish biologists/researchers, and persons familiar with trade marking/brand identification.

b) State-of-the-art marking methods will be researched, presented and considered.

c) Licensing structure of marine aquaculture must be researched, presented and considered.

d) Design the workshop to develop a consensus concerning marine shellfish aquaculture marking and marine shellfish aquaculture licensing.

e) Provide the consensus developed at the workshop concerning marine shellfish aquaculture marking and marine shellfish aquaculture licensing to the Department in the form of recommendations. Recommendations are to consider changes in rules and laws.

f) Develop and distribute proceedings, which include recommendations, of the workshop to the Department and to all workshop participants.

2. Shellfish marking and licensing services accepted for delivery by the Department shall include the following:

a) The Contractor shall submit for Department consideration of approval, a billing statement in sufficient detail for a pre-audit and a post-audit review. Such invoices shall be accompanied by a detailed report specifically documenting and determining shellfish marking and licensing as specified in Exhibit A, 1. a), b), c), d), e) and f).

b) The Contractor and the Contractor Project Manager shall be responsible for performing the "shellfish marking and licensing" services in a timely, safe, and judicious manner. In instances when the performance of "shellfish marking and licensing" services are jeopardized by failure or willful disregard to comply with terms of this Agreement, the Department shall not be liable to pay for such services as provided in this Agreement.

3. The Contractor shall, in consultation with the Department, settle any and all labor disputes.

B. Compensation.

The Department, upon approval of the billing statement and services provided by the Contractor, shall pay the Contractor the amount of \$40,000 provided results are delivered to and accepted by the Department. The Department will request approval from the Comptroller for advance payment, provided that the Contractor provides an invoice and justification for advance payment. Following the Department request, the decision for advance payment will be the Comptroller's.

Without waiving its rights to terminate this Agreement, the Department may delay, withhold or adjust payments under this Agreement in an attempt to fulfill its obligations or correct any violation of the Agreement.

C. Responsibilities of the Department.

1. The Department shall provide payment at the rate established herein to the Contractor upon submission and approval of a billing statement in sufficient detail for a pre-audit and a post-audit review.

2. The Department's Contract Manager or his successor shall be responsible for enforcing performance of the Agreement terms and conditions and he shall serve as liaison with the Contractor and shall approve all invoices prior to payment.

3. The Contractor's Project Manager is Charles Thomas, 2051 East Dirac Drive, Tallahassee, Florida 32310, Phone: 904/488-0163. The Department's Contract Manager is David Heil, Florida Department of Environmental Protection, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399, Phone: 904/488-5471. All matters shall be coordinated with or directed to the Contractor's and Department's Managers for proper disposition.

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APPENDIX B

AMERICAN ASSEMBLY PARTICIPANTS

* * * * *

<i>Group Leaders</i>	<u><i>Group 1</i></u> <i>Kal Knickerbocker</i>	<u><i>Group 2</i></u> <i>David Heil</i>	<u><i>Group 3</i></u> <i>LeRoy Creswell</i>
	<i>Barry Moore Ed Mangano Steve West Frank Feliciano Major Buckson Leslie Sturmer Wanda Prentis Chip Petre</i>	<i>Lucy Horsch Jeff Turner Jenny Wheaton Major J. Marsden Bill Teehan Alan Peirce Alan Huff Diane Berile Brad Powers David Vaughan *Charles Sembler</i>	<i>John Horsch Keith Zickuhr Shella Barger Lt. Wallendeck Charles Shelfer Charles Thomas Mark Berrigan Chris Combs Jack Whetstone Pat Barker *Tim Adams</i>
<i>Recorders</i>	<i>Darlene Snyder</i>	<i>John Scarpa</i>	<i>Rich Murmer</i>

** Participated only in group sessions on first day.*

APPENDIX C (1)

THE IDENTIFICATION OF AQUACULTURE PRODUCTS IN FLORIDA

Assembly Charges:

The goals of the Assembly are to: A) Identify bonafide marine aquaculture producers and products, and B) Recommend policies that will facilitate the promulgation of laws and rules pertaining to exemptions from resource regulations based on tagging, labeling, documentation and licensing.

AGENDA QUESTIONS

1. What are bonafide aquaculture products and who are bonafide aquaculture producers?
2. What are the benefits of developing a system to identify marine aquaculture products in Florida, and who would benefit from the system?
3. What are the disadvantages of developing a product identification system, and who would oppose the development of such a system?
4. Are any of the product identification systems used in other states applicable in Florida?
5. Determine the advantages and disadvantages of the following alternative techniques for product identification: (Factors such as technical feasibility, economic feasibility, and enforceability should be considered).
 - A. Product tagging and marking techniques.
 - B. Package labeling techniques.
 - C. Documentation and chain of custody techniques (i.e. paper trails, notification requirements, etc.)
 - D. Producer identification via licenses or certifications.

6. Can bonafide marine aquaculture products be identified through the alternatives listed in question 5) A-D?
7. If so, how should this be implemented?
8. Who should pay for the implementation of the system?

APPENDIX C (2)

The Identification of Aquaculture Products in Florida Problem-Solving Techniques

I. Nominal:

- * Silently Generate Options (such as for products and producers for ?1).
- * Going around the circle individually State One Option or pass. Do not comment on options until all are posted on the easelpaper. Number the options as they are generated.
- * Go around the circle as many times as needed to list all options.
- * Edit Options by combining or modifying-an option may only be modified if OK with the person who generated the original wording. If needed, renumber options.
- * Briefly Clarify meanings.
- * Individually Vote for as many items as you want (such as key phrases for the products and producers in ?1). Each individual may vote only once for a given item. * Review first round of voting and re-edit and vote again, if needed.
Engage in zesty conversations as you dig into your wise selves to Create Your Group Answer!
- * Finalize your wordings and/or lists. Label your easelpaper with a title and group name.

II. Brainstorming:

- * Individually generate options without any discussions or non-verbal comments. You may have two or three cycles of "Creation of Ideas".
- * Briefly discuss and vote for desired options with one vote per item per person.
- * Vote for desired options and discuss, revote if needed.

APPENDIX C (3)

COMPILATION OF METHODS FOR IDENTIFYING MARINE PRODUCTS

Developed by

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of

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American Assembly on Marine Aquaculture
Harbor Branch Oceanographic Institute
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Sponsored by

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Tallahassee, FL 32399

INTRODUCTION

The identification of cultured and wild-caught aquatic organisms has been historically accomplished by the use of receipts or written labels on containers, usually referred to as a paper trail. As with any identification system there is the possibility for abuse, such as the labelling of bivalves harvested in restricted waters as coming from approved waters. The need for discrimination between cultured and wild-caught aquatic organisms and the resultant products has recently become an issue at the regulatory level. Additionally, the identification of cultured aquatic organisms during marketing could improve their status and preference among consumers.

The following information is a compilation of identification methods and their advantages and disadvantages that have been used on aquatic organisms. These methods have been primarily developed for fish, but have been used on crustaceans, bivalves and gastropods, for studying stock enhancement and natural life-histories. This information is followed by a short discussion of the identification methods for discriminating between each species group of cultured and wild-caught aquatic organisms.

STYLES OF MARKING (Advantages and Disadvantages) from Nielsen (1992)

The first step in using an identification system is to understand the purpose and expected results for using a tag. This is because no tag is perfect for all needs. That is, no single marking system available meets all the characteristics of a perfect mark.

Characteristics of a Perfect Mark

- 1) remains unaltered during the organism's lifetime
- 2) no effect on behavior or vulnerability to predators
- 3) does not tangle with weeds or nets
- 4) inexpensive and easily obtained
- 5) fits any size organism with little alteration
- 6) easy to apply without anesthetic and with little or no stress to organism
- 7) identifies organism at least to group
- 8) creates no health hazard
- 9) does not harm food or aesthetic value of organism
- 10) easy to detect in the field by untrained individuals
- 11) causes no confusion in reporting
- 12) remains unaffected by preservation

Marking systems may be classified into seven categories: external tags, external marks, internal tags, natural marks, biotelemetric tags, chemical markers, and genetic markers. The advantages and disadvantages of each system for identification of primarily fish follows.

External Tags: Physical devices attached to organisms so that the devices are visible outside the organism's body. Tags usually pass into and sometimes through the body. External tagging is the most diverse marking style. However, because of the presence of the physical tag the technique has more disadvantages than other techniques. In bivalves and gastropods, tags may be glued in place.

Transbody Tags - protrude through both sides of the animal's body

- | | |
|-----------------------|--|
| Advantages: | High retention rate |
| | Long retention time |
| | Successful on narrow-bodied fish |
| | Successful on shrimp and crabs |
| | Suitable for all size organisms |
| | Easily detected |
| | Large surface for printing information |
| | Remote reading of tag codes |
| | Individual identification possible |
| | Little drag on swimming animals |
| Disadvantages: | Difficult and extensive tagging procedures |
| | May inhibit growth |
| | May become entangled |
| | May accumulate algae |

External Tags (cont.)

Dart-Style Tags - protrudes through only one surface of the animal and is anchored with a barbed end

Advantages:

- High retention rate
- Little effect on tagged animals
- Successful on lobsters
- Successful on wide-bodied fish
- Suitable for very large animals
- Easy and rapid application techniques
- Can be performed by volunteers
- Individual identification possible
- Large surface for printing information
- Easily detected

Disadvantages:

- Not useful on smaller animals
- Quality of attachment is difficult to control
- Loss of tagging information from abrasion or separation of legend from shaft
- May produce abrasion or enlarged tagging wound
- May become entangled

Internal-Anchor Tags - similar to dart style except anchor is usually a flat disc; requires an incision

Advantages:

- High retention rate
- Long retention time
- Little effect on tagged animals
- Successful on wide-bodied fish
- Suitable for large specimens
- Individual identification possible
- Large surface for printing information

Disadvantages:

- Difficult and extensive procedures
- Not useful on narrow-bodied fish
- Not useful on small specimens
- Danger to internal organs
- Loss of tagging information from abrasion or separation of legend from shaft
- Less easily detected
- May become entangled

External Marks: Alterations to the organism's appearance that enable the organism to be identified externally. Partial amputations (e.g., fin clips), brands, tattoos, pigments, and dyes are common methods. External marks are the easiest to apply and probably the most widely used for short-term and geographically restricted projects. In organisms with a shell, shell notches and engraving may also be used.

Fin Clipping

Advantages: Easy and rapid process
No effect on growth
Suitable for all fish
Suitable for all sizes and life-stages
Adaptable for short- and long-term studies

Disadvantages: Individual marks not available
Limited number of group marks available
Mortality depends on fish size, fin clip and handling
High error rate for recognizing and interpreting clips
Negative public opinion

Cold Branding - creation of a recognizable scar on animal by touching a chilled metallic symbol to body

Advantages: Easy and rapid process
Probably no effects on growth, survival or behavior
Suitable for all sizes of animals
Suitable for remote locations

Disadvantages: Suitable primarily for scaleless or fine-scaled fish
Individual marks not available
Limited number of group marks available
Limited to short-term studies
Difficult to see and interpret
Cold temperatures can burn workers

Pigment Marks

Advantages: Easy and simple procedure
Negligible effects on marked animals
Suitable for many fish, crustaceans and bivalves
Highly visible marks
Probably suited for long-term studies
Tattoos allow individual identification

Disadvantages: Individual marks not generally available
Detection may require special equipment and facilities
Suitable for special conditions only
Detection difficulty increases with time
Less suitable for small animals
Marks on head lost if specimens are decapitated

Internal Tags: Physical devices implanted entirely within the organism's body. A variety of tags have been tried, but today the most common is probably the coded wire tag; a nearly microscopic bit of wire (0.5-1.0 by 0.2 mm) notched with a binary code. Recovering internal tags usually requires sacrificing the animals, but new styles of tags and implantation techniques are being developed that allow the tags to be read externally or excised without harm to the organism. Jefferts et al. (1963) introduced the coded wire tag. Passive integrated transponder tags are larger (12 by 2 mm) than CWTs but allow for individual identification and do not require sacrificing the organism. PIT tags are miniature signal-relay stations that contain a preprogrammed signal (i.e., an alphanumeric code). Prentice (1990, and Prentice et al., 1990) introduced the PIT tag for aquatic animal use.

Coded Wire Tags

Advantages:

- Little effect on growth, behavior or mortality
- Absence of protruding tag
- Suitable for long-term studies
- Suitable for all sizes and life stages
- Suitable for most fish, crustaceans and bivalves
- High retention rate
- Designed for large-scale marking
- Strong commercial service and technical advice

Disadvantages:

- Variable immediate tagging mortality
- Variable effect on crustacean molting and appendage deformation
- Tagging location must be determined for each taxon
- Customized tagging equipment and routine needed for each taxon
- Detailed training and supervision of taggers needed
- Extensive tag detection process
- Animals usually must be sacrificed
- Individual marks not generally available
- Capital and labor intensive

Passive Integrated Transponder (PIT) Tags

Advantages:

- Probably little effect on growth, behavior or mortality
- Suitable for many species
- Suitable on all sizes
- High retention rates
- Individual identification available
- Suitable for long-term studies
- No handling needed to identify animal
- Strong commercial interest

Disadvantages:

- Limited documented experience available
- Short signal detection range
- Expert personnel needed
- Tags expensive

Natural Marks: External or internal patterns or markings, e.g., scale or otolith patterns, shell patterns, morphological dimensions, and parasite loads. Natural marks may have the least effect on the organism but can only be used with organisms that have distinctive natural patterns or marks.

Scale and Otolith Marks

- Advantages:**
- No marking process required
 - No effect on growth, behavior or mortality
 - Small recapture sample required
 - Field procedures routine
- Disadvantages:**
- Individual marks not available
 - Otolith marks require sacrificing the fish
 - Extensive sample preparation
 - Mark feature may change as fish grow or age
 - Only statistical data are provided
 - Validation required for each study

Induced Otolith Marks induction is by growth checks usually involving temperature shocks

- Advantages:**
- No effect on growth, behavior or mortality
 - Suitable for larval fish
 - Suitable for mass marking
 - Permanent marks for long-term studies
 - Small recapture sample required
- Disadvantages:**
- Individual marks not available
 - Fish must be sacrificed to obtain otolith
 - Primarily useful for hatchery-raised fish
 - Requires precisely controlled environment
 - Plumbing renovations may be required
 - Extensive sample preparation
 - Technique still experimental
 - Pilot projects needed to establish necessary procedures to induce desired mark

Other Natural Marks

Disadvantages:

Morphometry: body shape and color variable, discriminating ability low

Meristic Counts: useful only in clupeid fish, used usually for taxonomic purposes

Parasites: underlying assumptions restrictive, limited utility

Biotelemetric Tags: Devices that transmit signals detected by a receiver at a remote station. These tags are categorized by their style of data recovery instead of method of attachment (external or internal tagging). The organisms themselves do not need to be recaptured or handled because the tags send information continuously to a remote observer or computer-linked sensor. Acoustic tags for lobsters have been recommended only for large animals (> 44mm carapace length) because of the effect they have upon swimming performance (Newland and Chapman, 1993).

Ultrasonic Biotelemetry

- Advantages:**
- Remote sensing of tagged animals
 - Suitable for all species
 - Continuous monitoring possible
 - Allows individual identification
 - Long detection range in water
 - Useful in fresh and salt water
 - Highly directional signals
 - Allows precise location of animals
- Disadvantages:**
- Expensive and complicated system
 - Few animals can be monitored at same time
 - Effects on growth, behavior and mortality depend on specific conditions
 - Not suitable for very small animals
 - Not suitable for long-term studies
 - Physical obstacles interfere with signals
 - Signals must be received underwater
 - Signal frequency can drift substantially

Radio Biotelemetry

- Advantages:**
- Remote sensing of tagged animals
 - Suitable for all species
 - Continuous monitoring possible
 - Allows individual identification
 - Highly developed for wildlife uses
 - Signals detected in air
 - Not affected by physical obstacles
 - Highly directional signals
 - Long detection range in air
 - Low drift among frequencies
- Disadvantages:**
- Expensive and complicated system
 - Effects on growth, behavior and mortality depend on specific conditions
 - Signals lose energy rapidly in water
 - Not suitable in saline water
 - Tags usually carry protruding antennas
 - Not suitable for very small animals
 - Not suitable for long-term studies

Chemical Marking: Involves the detection of virtually harmless chemicals that have been introduced into the organism (e.g., rare earth elements, tetracycline, calcein) or accumulated naturally. Even though chemical marking has been the subject of much experimentation it has not been used widely in routine marking operations.

Chemical Marks

- Advantages:**
- Chemicals used are natural, nontoxic to animals and humans
 - Applicable to all sizes and life stages, including eggs
 - Many animals marked simultaneously
 - Useful on many taxa (presumably)
 - Long-lasting marks
 - Nonstressful, noninvasive marking process
- Disadvantages:**
- Often requires sacrificing animal
 - Detection becomes harder as animal grows
 - Individual marks not available
 - Elemental marks require analytic chemistry
 - Environment and genetics can affect concentration of chemicals
 - Interpretation is statistical rather than absolute
 - Detailed pretesting needed for each taxon

Genetic Markers: Unique protein forms or DNA fragments. Although genetic markers may be considered natural marks, the genetic basis for the analyses and statistical nature of the data make genetic markers distinctly different. Future developments in the introduction of known DNA markers into an organism may enhance the sophistication of this technique even more. Genetic marking initially took advantage of protein coding genes which have proven useful, but only represents about 1% of the total DNA of an organism (Utter and Seeb, 1990). Increasingly, the use of mitochondrial DNA (Ferris and Berg, 1987; Baker and Palumbi, 1994) and DNA fingerprinting (Castelli et al., 1990) is being explored and applied.

Genetic Identification

- Advantages:**
- Natural method, requiring no artificial marks
 - All individuals carry information
 - All life stages carry information
 - Information lasts throughout life span of individual
 - Information passes between generations
 - Sufficient polymorphism available in most species
 - Experience available from medical and biological fields
 - Inexpensive per sample
- Disadvantages:**
- Often requires sacrificing animals
 - Technically complex
 - Interpretation of results may be difficult
 - Information usually about groups, not individuals
 - Experts needed for successful use

Table 1. Comparison of marking techniques to characteristics of the perfect mark (from Nielsen, 1992).
Relative to the ideal characteristic, H=High, M=Median, and L=Low conformity.

Characteristic of ideal mark	External Tags	External Marks	Internal Tags	Natural Marks	Biotelemetry	Genetic Identifiers	Chemical Marks
Remains useful during entire life span	M	L	H	M	L	H	L
No effect on behavior, predation	L	M	H	H	L	M	H
Does not tangle in nets, weeds	L	H	H	H	L	H	H
Inexpensive	H	H	M	M	L	M	L
Independent of animal size	L	H	H	M	L	H	M
Easy to perform without stress or anesthetic	L	M	M	H	L	L	H
Able to identify groups	H	H	H	H	H	H	H
Able to identify individuals	H	L	M	L	H	L	L
Creates no health hazard	H	H	H	H	H	H	L
Does not harm food or aesthetic value of animal	L	L	M	H	L	H	L
Easy to perform by untrained persons	H	M	L	L	L	L	L
Causes no confusion in detection or analysis	H	L	H	L	H	M	M
Unaffected by storage	H	L	H	M	H	H	L

Table 2. General applicability of various marking systems to important selection criteria (from Nielsen, 1992).

Criterion	External Tags	External Marks	Internal Tags	Natural Marks	Biotelemetry	Genetic Identifiers	Chemical Marks
Identification can be Groups Individuals	X X	X	X X	X	X	X	X
Recapture can be Once Repeated Dead Alive	X X X X	X X X X	X X X*	X X	X X	X X	X X
Animal can be Fish Invertebrate Large Small	X X X	X X X X	X X X X	X X X	X X X	X X X	X X
Study can be Short Long	X X	X	X X	X X	X	X	X
Identification can be Professional Volunteer	X X	X X	X X	X	X	X	X

*Some newly developed techniques, such as use of visible implant tags and of new injection sites for coded wire tags, allow internal tags to be read or extracted without death of the animal. Most internal tagging, however, involves ultimate loss of the animal.

TAG LOSS

The loss of tags or marks must be taken into consideration for any program. External marks or tags may be lost, for example, from abrasion, attachment or adhesive failure, or embedded within an organisms as it grows. Even internal tags are sometimes lost due to improper implantation or the organism's body rejecting and shedding the tag. Tag loss may be estimated first by double-tagging (Wetherall, 1982) under experimental conditions.

AQUATIC ORGANISMS AND TAGGING POSSIBILITIES

The choice of a tagging system depends on the purpose of the study and the intended results. The following section is for discussing tags that can be used to discriminate between cultured and wild-caught organisms. This requires a mark that may be inconspicuous for law enforcement purposes and a mark that is very noticeable for marketing and consumer purposes. Obviously, inconspicuous marks and conspicuous marks can be used for the opposite purposes, that is, of not affecting product marketability and as a deterrent, respectively. For certain purposes, marks may not have to be applied to every individual but only to a portion so that if marked individuals are found within a group the necessary information could still be derived.

The most important criteria in choosing a marking technique is knowing if the animals being marked have to be identified individually or as a group. Generally, tagging animals for group analysis uses marks that are less stressful to the animal.

Fish

Reports and articles on the use of tags for fish identification abound. The preceding section on advantages and disadvantages of tag types pertains primarily to fish (Nielsen, 1992). Therefore, this section will be limited to what is considered the best tag type for discriminating cultured versus wild-caught organisms.

As has been mentioned, the purpose and expected results must be delineated prior to any marking scheme. If the objective is to discriminate at the market level, the use of an external clip tag on the gill is appropriate. Such a system is used in Nova Scotia to identify cultured salmon (Cyr Couturier, pers. comm.). The tags are applied after harvest at the farm gate by the producer or processor before they go to market. Tag information includes farm location.

If the objective is to have an animal marked throughout most of its life, the use of a different system is needed. Fluorescent pigment granules (30-350 μm) or grit has been used to mark trout that were stocked into a natural lake over a twelve year period (Nielsen, 1990). This type of mark was applied externally by pressure sprayer to batches of fish and lasted for the extent of the experiment, although the mark did reduce in size. The color of the granules was only visible under ultra-violet light. One drawback to the use of pigment granules is that small fish (25 mm) have a small surface area and do not retain as many particles compared to larger fish (125 mm).

Presently, the most widely used tag for life histories and stock identification is the coded wire tag (e.g., Buckley and Blankenship, 1990; Dunning et al., 1990; Johnson, 1990; Mattson et al., 1990; Peltz and Miller, 1990). Coded wire tags (CWTs) are 1.0 mm by 0.25 mm stainless steel wire that is etched with a binary code and implanted in cartilage, connective tissue or muscle. An advantage of CWTs is that the material is inert and small enough that if ingested will pass through a human digestive system. Tag loss is minimal (< 10%) when applied by an experienced operator and the tags do not degrade. Marine ornamental fish may be best marked by CWTs or chemicals (e.g., tetracycline) since the aesthetic value would not be diminished.

Small visible tags may be beneficial for regulators, growers, retailers, and consumers of sea food. Small visible tags are 2-4 mm by 0.5-2 mm, and 0.1 mm thick. The tags are inserted into tissues that are transparent (e.g., near the eye of a fish). The tag lies very close to the surface of the organism so that it is visible. Research into the use of small visible tags is still in its infancy, but early reports indicate it may be a potential alternative to other tag types (Haw et al., 1990). The need to develop an efficient injector and tag design remain.

Crustacea

One aspect of tagging crustaceans, that is not common for other organisms, is loss of tags during molting. Therefore, externally attached tags are not useful, but internal and internally anchored tags have been shown to stay in place through molts. Another concern is the effect the tag may have upon survival and morphology after a molt (Hurley et al., 1990; Krouse and Nutting, 1990a). Abnormal leg formation is the most often reported deformity, since this is where tags are often placed. Similarly, mortality is often caused by implanting the tag too deeply and puncturing an organ. These problems can be reduced with correct technique and placement of the tag.

Coded wire tags have been tested successfully under laboratory conditions on juvenile blue crabs for 80 days and through two molting cycles (Fitz and Wiegert, 1991). Lellis and Pardee (1992) found that CWTs could be implanted in the second post-pluerulus stage, but not the first, of the spiny lobster. American lobsters tagged with CWTs at 12-24 mm carapace length, released into the wild and recaptured after one year were determined to have undergone an average of 3.4 molts (Krouse and Nutting, 1990b), obviously without loss of the tag.

Prentice (1990) initially reported the successful use of passive integrated transponder tags (PITs) on the giant prawn *Macrobrachium* and the rock crab, *Cancer magister*, thereby eliminating the need to sacrifice the animal as with CWTs. The use of PIT tags has been assessed on crayfish and found that they increased mortality in specimens under 25 mm carapace length, but are otherwise acceptable (Wiles and Guan, 1993). Donaldson et al. (1992) tested PIT tags on adult red king crabs in the Bearing Sea for 2-3 months and found excellent results in recovery. They, also, pointed out that placement was important not only for tag retention but for processing as not to contaminate the final product.

Bivalves

The marking of bivalves has predominantly been accomplished with external marks or tags. Ropes and Merrill (1970) tested an assortment of inks, paints, tags and shell notching on the surf clam, *Spisula solidissima*. They concluded that conspicuous tape attached with a sealant and combined with shell notching was the most effective, lasting at least 12 months. Inks and paints were not adequate. One drawback seems to be size for this type of marking as the smallest average size of the clams was 2 cm. The use of invisible paints or glues with added fluorescent pigments has also been successfully tested on bivalves (Tufts, 1967). Marks lasted at least one year in a flow-through sea water system, but again the test animals were greater than 2 cm when marked.

The use of chemicals to permanently color the shell visibly (alizarin, Hidu and Hanks, 1968) and invisibly (tetracycline, visible only under UV-light, Dey and Bolton, 1978) has been successful. It is best accomplished with smaller animals (< 2cm) because of rapid shell deposition where the compound is sequestered. Alizarin marks were still evident after 18 months (Hidu and Hanks, 1968) and tetracycline marks were readable for at least seven months (i.e., until the end of the study, Dey and Bolton, 1978). There may be species specificity to these agents, as clams and oysters were marked vividly with tetracycline but mussels were not (Dey and Bolton, 1978). Drawbacks to the use of tetracycline for marking are the need for an FDA exemption to use the antibiotic on bivalves and the method is patented (#4,133,294, Process for Marking Molluscs, University of Delaware).

Shell coloration changes induced by dietary changes has not been observed in bivalves as it has for abalone (Leighton, 1961; Olsen, 1968). The inducement of shell coloration changes in mussels has been accomplished by light intensity alteration (Trevelyan and Chang, 1987). Mussels are normally dark colored, but when reared under low light conditions the shell is almost beige. By alternating light intensity, bands of dark and light are produced. The bands are permanent until being eroded away since the bands are near the umbo. Under field conditions the mark was evident for 75 days (length of study; Trevelyan and Chang, 1987).

A serendipitous finding by Littlewood (1984) revealed that mangrove oysters grown on discarded tires were imprinted with the design of the letters, ridges, and numbers. He suggested the use of setting material with specific patterns depicting stock numbers, trademarks, or marketing logos (Littlewood, 1984). In the HBOI hatchery this type of shell molding has been noticed on oysters that

adhere to nylon screen material resulting in a checkered pattern. The duration of the mark has not been established.

Another use of shell marking has been to take advantage of the genetically controlled natural shell coloration of clams and scallops. In hard clams, *Mercenaria*, there is a natural shell color variant referred to as the notata clam. In the wild, this variant is found at very low proportions. The notata marking is heritable and can be bred into a population very quickly. Scallop color variants (e.g., orange) have been used for stock enhancement identification (Karney, 1991) and also could be bred into a population very readily. Karney (1991) mentions the use of easily identifiable scallops as a plus for stock enhancement. The conspicuous color can be readily seen by professional and amateur harvesters. Therefore tax payers whose counties support stock enhancement programs can see the results clearly.

The use of CWTs for bivalve identification was demonstrated elegantly by regulators of the clamming industry in the Pacific northwest (Haw, 1992). Law enforcement officials had noted manila clams were being harvested from closed waters in Puget Sound, Washington. Tags were covertly implanted into the hinge ligament of approximately 100 of the harvested clams and placed among thousands. After the clams had been sold to retailers, search warrants were obtained and a search conducted. Tagged clams were detected in a ratio of approximately 1:3000. A preliminary study had been done and found that tag retention was 97% after 2 months.

Gastropods

Although gastropods are similar to bivalves in having an outer shell, differences in tag research are evident. Tag loss of polyethylene tags secured by cyanoacrylate has been shown to increase with time although at different rates for different gastropod species (Treble et al., 1993). Size constraints for marking have always been a problem. The use of nail polish has been shown to be very effective for marking snails as small as 0.9 mm with the mark persisting for 40 days in the field (Gosselin, 1993) with remnants of the mark lasting up to 80 days. Remarking of the individuals showed that marks could last up to one year (Gosselin, 1993). The use of non-toxic epoxy that hardens underwater may help in tagging certain shelled species: tags applied underwater to whelks with this method have been located 9 months later (Rosenthal, 1969). Another underwater tagging technique, applicable primarily for abalone, is the use of a nylon wall anchor or rivet to secure a tag to one of the respiratory pores (Prince, 1991). Tagged abalone have been recovered after one to two years in the field (Prince, 1991).

The use of dietary changes to alter shell coloration has been accomplished with abalone (Leighton, 1961; Olsen, 1968; Katsuhiko T. Wada, pers. comm.). However, the shell coloration difference may be lost by the time of harvest due to shell erosion, unless very large seed (25 mm) are planted (Tegner and Butler, 1989). This method has been used in Japan to distinguish hatchery reared juveniles released into the field (Katsuhiko T. Wada, pers. comm.). Abalone have also been shell notched at the time of field planting. The notch is repaired and plainly visible up to harvest (Tegner and Butler, 1987).

Hybrid organisms have been suggested for distinguishing between cultured and wild organisms (Tegner and Butler, 1989), but unless the hybrid is easily distinguishable it is unlikely to be of use. If the hybrid is easily distinguishable then consumer apprehension regarding a new species must be overcome.

Aquatic Plants

To our knowledge the discrimination of cultured versus wild harvested aquatic plants has not been addressed in the literature.

Live Rock

Live rock is composed of an inorganic base material (e.g., rock) upon which living organisms (i.e., invertebrate and plant) grow. The harvesting of live rock for the aquarium trade has escalated to an alarming point. The removal of such material from natural waters for sale is considered being banned by the federal government. If such a ban were to go into effect the need for distinguishing between cultured and natural material is obvious.

Since the controversy stems from the removal of not only plant life but the base rock, methods to discriminate between natural and cultured live rock have focused on recognition of the base material. Some possible methods for discriminating between the types are as follows:

- the base rock to be nonindigenous
- the base rock to be artificial (e.g., combination of recycled materials)
- the base rock to carry a mark or company logo
- the base rock to carry an internal tag (PIT tag)
- the base rock to be of standard shapes (this requires the molding or shaping of the rock material)

STATE SURVEY

A telephone survey (Table 3) was conducted of state regulatory agencies, Sea Grant offices, and extension representatives regarding policies and regulations of aquaculture species in other states. Overall, there did not seem to be any problems existing for distinguishing between cultured and wild-caught animals. Nor were there problems where exemptions existed for cultured products in relation to regulations (e.g., size, season, limit) for wild-caught species. In virtually all cases only a letter of authorization, special permit number, or paper trail was required to distinguish these products after harvest or during transport.

MARKETING

Marketing strategy for consumer recognition of aquacultured species versus wild-caught species is beyond the scope of this review, but the institution of a market brand or logo is an important step in consumer knowledge, acceptability and preference. Minimally, at the retail level there should be an obvious sign or indicator that tells a consumer the fish or shellfish has been cultured and to what degree. The definition of the term cultured must be chosen carefully for legal and marketing implications and be displayed for consumers. These displays would need to be in highly visible areas so consumers could check it as they peruse the products. The display could indicate graphically or pictorially the difference between a depurated, antibiotic-free, finished, or totally cultured organism.

Table 3. Results from phone survey for state regulations and exemptions of marine products.

State	Species	Aquaculture	Tag	Requirements
Georgia	Clams	Hatchery	Yes	Paper trail only letter of authorization if under-sized
Virginia	Clams	Lease permit	Yes - designated by lease are markings	Exempted from Sunday harvest restriction Paper trail
	Oyster	Mariculture exempted from size	Yes - only lease number	Paper trail
	Striped bass	Wild	Wild - Yes; Full individual fish tag from landing through sale	Individual fish tag for wild landings only
	Hybrid	Aquaculture exemption permit required	Yes, but no individual tags	Container market with permit number. Paper trail only
	Tilapia		No	
	Trout		No	
	Catfish		No	
North Carolina	Clams	No size or bag limit	Yes - lease and permit number	Aquaculture operation permit number on tag
	Oysters	No exemption during regular season - off season exemptions	Yes	Out of season exemption has paper trail - exemption letter

Table 3 - Continued

State	Species	Aquaculture	Tag	Requirements
Mississippi	Oysters	Same requirements	No	
	Catfish	Distinguished from wild fisheries for marketing No labeling requirements	No	
	Tilapia	Guidelines	No	
	Black Bass	Culture only	No	
	Hybrid Bass	Permit (label for marketing only)	Yes	Permit number labeled
Louisiana	Oysters	Private leaseholder Any size	No	Shellfish lease number and shellfish tag only papertrail. No bag limits or season for private; 15 bag limit and season for public
	Marine Finfish	Mariculture exempt/permit	Yes	Papertrail to facilities and hatchery
	Fresh Water Finfish	Fish farmers license/enclose impoundment/pond/lake	No longer any individual tags required for each fish	Exemption only papertrail
	Soft-shelled crabs	Exempt for undersize. 5" hand peelers for shadders	Yes	Identified in crate - maintained in separate container and so marked

Table 3 - Continued

State	Species	Aquaculture	Tag	Requirements
Texas	Red Drum	Farm raised	Yes	Papertrail exempt with fish farmers permit - package labels only
	Shrimp			Permitted for exotic species
Oregon	Oysters	All private property	No	
North Carolina	Clams	Aquaculture exempt with seasons and sizes	Yes - Lease number on shellfish tag	Paper trail from lease number
	Hybrid striped bass	Aquaculture permitted	Yes - Permit number on box	Box has permit number - harvest notified - no individual tags
	Non-native shrimp	Aquaculture exempt with permit	No	Paper trail on live shipments and hauling harvest
	Red Drum	Aquaculture permit	Yes	Box has permit number and paper trail

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ACKNOWLEDGEMENTS

The compilation of identification systems for aquatic organisms was greatly facilitated by the availability of American Fisheries Society publications on the subject, especially Nielsen's (Nielsen, 1992) synthesis of the AFS Symposium 7. We would like to thank all the people domestically and internationally who responded so unselfishly to our inquiries. Finally, we would like to thank Ruth Aldrich for her skills in preparing the tables for this report.



STATE OF MARYLAND
DEPARTMENT OF AGRICULTURE
50 HARRY S. TRUMAN PARKWAY
ANNAPOLIS, MARYLAND 21401



Aquaculture Office (410) 841-5724
Seafood Marketing (410) 841-5820

FAX: (410) 841-5987

DATE: 10-18-94

TO: Alan Peirce

FROM: 904-922-3671

FROM: Brad Powers

NUMBER OF PAGES (including cover) 3

MESSAGE:

Please note .10 E. Marketing and Identification
of Aquaculture Products - Finfish

Generally speaking, oysters are the only
shellfish grown in any quantity. A copy
of the bottom lease ~~on~~ board the
harvesting vessel is all that is
required. Also, the lease holder must
place his/her lease number on each
container of shellfish when sold.

Hope this helps.

Brad

(c) Maintain shipping and receiving records by species of the distribution of fish or aquatic plants to or from a permitted facility; and

(d) Notify the Department immediately upon the discovery of any disease affecting the fish or plants at the facility that has the potential to contaminate native or naturalized species of fish.

B. The records required by §A(3) shall be maintained at the facility, or at a specified location other than the facility for 3 years, and be made available to the Department for inspection upon request.

.09 Approval of Permits.

A. The Department may issue a permit to engage in aquaculture activities authorized by law and these regulations, after receipt and approval of a completed application.

B. Permits issued by the Department shall be:

(1) Valid for a 5-year period, and expire on December 31 of the fifth year after issuance;

(2) Issued for each facility separately.

C. Permits issued by the Department are not transferrable.

D. Permits may be modified or amended upon request of the permittee, or at the direction of the Department.

E. The Department may deny a permit application to possess species of fish or aquatic plants which may have an adverse impact on fish populations or their ecosystems.

.10 Special Requirements.

A. Native or Naturalized Species. Facilities which produce native or naturalized fish species listed in Regulation .07 shall confine production to the permitted location.

B. Non-native Species.

(1) A person may not conduct aquaculture activities using non-native fish except in approved nontidal ponds, lakes, and impoundments.

(2) Facilities approved for non-native or hybrid finfish in nontidal ponds, lakes, and impoundments shall be constructed to assure that non-native stocks are precluded from entering the tidal waters of the State. A facility may not discharge its effluent directly or indirectly into Maryland waters without approved treatment.

(1) Brood stock, or the progeny of native or naturalized species of finfish, may be obtained from an out-of-State registered fish dealer. They shall be certified by an authority acceptable to the Department to be free of known, infectious diseases that have the potential to contaminate native or naturalized species of fish.

(2) Out-of-State suppliers shall be registered with the Department before doing business in Maryland.

(3) The Department may provide technical assistance, upon request, to determine whether the fish have any known viral, bacterial, protozoan, or parasite infections which have the potential to contaminate finfish populations of the State.

(4) Each purchase or acquisition of finfish for aquaculture purposes shall be accompanied by a receipt, or other written evidence showing the date, source, species, quantity of the acquisition, and its destination. Receipts shall be retained as part of the permittee's records for 3 years.

(5) Imported hybrid or non-native finfish shall be certified by an authority acceptable to the Department to be free of known, infectious diseases that have the potential to contaminate native or naturalized fish or aquatic plants.

D. Size Requirements. After January 1, 1990, there is no minimum size requirement for any species of finfish propagated from aquaculture nontidal ponds, lakes, and impoundments, provided the production of finfish from permitted facilities is identified as an aquaculture product.

E. Marketing and Identification of Aquaculture Products—Finfish.

(1) Finfish aquaculture products that are produced in, sold in, imported to, or exported from Maryland shall be packaged and labeled in accordance with §E(2) and (3), below.

(2) Dead or processed aquaculture finfish product or parts of it may be offered for sale subject to the following conditions:

(a) The product shall be identified as an aquaculture product. Packages and containers containing aquaculture products shall be tagged or labeled with a uniform series of 14 digit numbers and letters as shown in the example below:

MD = State of origin

123 = Permit number

0889 = Month and year

A1234 = Species ID and amount of product

(b) If individually marked, the product shall have affixed a printed label bearing the same information listed in §E(2)(a), above.

(c) The sale of the product shall be accompanied by a receipt showing the date of sale, the name, address, and permit number of the aquaculture facility, the numbers and species of finfish sold, and the name of the purchaser. The consignee of each subsequent sale shall retain a copy of the bill of lading or similar accountable document for 1 year and make it available to the Department upon request.

(3) Live aquaculture finfish which are produced in nontidal ponds, lakes, and impoundments and imported, exported, or offered for sale in Maryland shall be subject to the following conditions:

(a) Live finfish from any source may not be stocked in Maryland waters unless specifically permitted by the Department;

(b) Live finfish may be moved and stocked within a permitted facility, if the terms of the permit are not violated by the movements;

(c) Live finfish may be freeze-branded alive with an "A" ½ inch square, which shall serve as a mark on a processed product without affixing a tag described in §E(2)(b), above;

(d) A shipment of live eggs, fry, or fingerlings offered for sale or exchanged shall be accompanied by packaging or labeling which bears the:

(i) Name,

(ii) Address,

(iii) Permit number,

(iv) Species, and

(v) Number of finfish.

.11 Reports.

A. A permittee shall submit an annual report of activities undertaken under the permit on a form provided by the Department.

B. A permittee shall furnish other information necessary to complete an application, or to report on activities conducted under the permit.

.12 Suspension or Revocation of Permits.

A. The Department may suspend or revoke a permit of a permittee who violates the terms or conditions of the aquaculture permit, these regulations, or the laws governing aquaculture in Maryland.

B. If the Department has reason to believe that a permittee is violating the permit, these regulations, or any of the laws governing aquaculture, the Department shall issue a notice of violation to the permittee.

C. A notice of violation shall set forth the facts which the Department believes warrant suspension or revocation of the permit and give the permittee an opportunity to request a contested case hearing.

D. Hearings shall be conducted in accordance with the contested case procedures set forth in State Government Article, §10-201 et seq., Annotated Code of Maryland.

E. Nothing in these regulations shall be construed as preventing the Department from seeking any appropriate form of judicial relief against a permittee.

Administrative History

Effective date:

Regulations .01—.03 adopted as an emergency provision effective January 1, 1990 (17:1 Md. R. 63); emergency status extended at 17:11 Md. R. 1333; emergency status expired July 31, 1990

Regulations .01—.12 adopted effective September 3, 1990 (17:17 Md. R. 3078)

Regulation .07A amended effective March 1, 1993 (20:4 Md. R. 370)

APPENDIX C (5)

CLEMSON UNIVERSITY Baruch Forest Science Institute Facsimile Lead Sheet

No. of pages 14 (including this page)

TO: ALAN Pierce
FLA. Dept. of Ag

FROM: JACK Whetstone - 546-4481
Clemson Univ

FAX # 803-546-6296

PHONE 803-546-1013 - 546-4481

Time sent: 11:20 AM Date 25 Oct. 1994

By: Jack Whetstone

Comments: The First 2 pages are a summary
of S.C. Importation Laws. The next 2 pages - the laws
The next 9 pages are Attachments (Shrimp Permit & terms
and conditions). Good luck!

I'll see you Wed. Nov. 1

Jack Whetstone

South Carolina Importation Laws

The importation of Wildlife is under Chapter 16, Section 50 of the South Carolina Code of Laws.

Section 50-16-10 defines wildlife as any member of the animal kingdom including without limitation a mammal, fish, bird, amphibian, reptile, crustacean, arthropod or other invertebrate.

Section 50-15-20 - Importation of Wildlife for Certain Purposes Prohibited Investigation Permit.

Species of marine or estuarine fish, crustacean, mollusk, or other marine invertebrate not already found in the wild or not native to this state may not be imported without a permit.

A permit may be granted only after investigations and inspections of the wildlife have been made as the Department of Natural Resources considers necessary and the department approves the possession, transportation or importation into the state. The department may not issue a permit unless it finds: 1) the wildlife was taken lawfully in the jurisdiction in which it originated. 2) the importation, release or possession of the wildlife is not reasonably expected to adversely impact the natural resources of the state or its wildlife populations.

Section 50-16-30 - Importation of Diseased Animals Prohibited.

It is unlawful for a person to possess, transport or otherwise bring into the state or release or introduce into the state any diseased wildlife or animal that reasonably might be expected to pose a public health or safety hazard as determined by the SC Department of Health and Environmental Control after consultation with the Department of Natural Resources.

Section 50-16-60 - Exceptions to Permit Requirements for Certain Wildlife Imported as Pets.

Importation of the following wildlife for sale in the pet trade does not require a permit. The list includes tropical fishes, reptiles and amphibians.

South Carolina allows the Importation non-native marine shrimp. All other environmental permits must be in hand and a series of terms and conditions are listed for the Importation of such shrimp.

South Carolina also has a permit for hybrid striped bass which has a similar set of terms and conditions as the permit for the importation of marine shrimp.

The SC Department of Natural Resources is developing a protocol for the importation of shellfish in South Carolina. The **DRAFT PROTOCOL** is as follows:

Shellfish (clams, oysters, and scallops) being imported into South Carolina for replanting shall be accompanied by a certificate stating that they are free of any pathogen not previously known to occur in this state. Furthermore, the levels of infection with any recognizable pathogen must not be unusually high. For parties importing shellfish on a more or less continuing basis, certification shall be performed quarterly. All certification must be issued by a recognized independent shellfish pathologist. Shellfish not accompanied by an acceptable certificate shall not be imported into the state for aquaculture purposes.

CHAPTER 16
IMPORTATION OF WILDLIFE

- Sec.
50-16-10. "Wildlife" defined.
50-16-20. Importation of wildlife for certain purposes prohibited; investigation; permit.
50-16-30. Importation of diseased animals prohibited.
50-16-40. Exception to permit requirement for wildlife imported for exhibition purposes.
50-16-50. Authority to promulgate regulations.
50-16-60. Exception to permit requirements for certain wildlife imported for sale as pets.
50-16-70. Penalties.

Sec. 50-16-10. "Wildlife" defined.

For the purpose of this chapter, "wildlife" means a member of the animal kingdom including without limitation a mammal, fish, bird, amphibian, reptile, mollusk, crustacean, arthropod, or other invertebrate.

Sec. 50-16-20. Importation of wildlife for certain purposes prohibited; investigation; permit.

(A) It is unlawful for a person to import, possess, or transport for the purpose of release or to introduce or bring into this State any live wildlife of the following types without a permit from the department:

(1) a furbearer, a member of the family Cervidae, a nondomestic member of the families Suidae (pigs), Tayassuidae (peccaries), Bovidae (bison, mountain goat, mountain sheep), coyote, bear, or turkey (genus Meleagris). Furbearer includes, but is not limited to, red and gray fox, raccoon, opossum, muskrat, mink, skunk, otter, bobcat, weasel, and beaver;

(2) a species of marine or estuarine fish, crustacean, mollusk, or other marine invertebrate not already found in the wild, or not native to this State,

(3) a species of freshwater fish, crustacean, mollusk, or other freshwater invertebrate not already found in the wild or not native to this State.

(B) A permit may be granted only after the investigation and inspections of the wildlife have been made as the department considers necessary and the department approves the possession, transportation, or importation into the state. The department may not grant a permit unless it finds:

(1) the wildlife was taken lawfully in the jurisdiction in which it originated;

(2) the importation, sale, or possession of the wildlife will not unduly impact the natural resources of the State or its wildlife populations.

Sec. 50-16-30. Importation of diseased animals prohibited.

It is unlawful for a person to possess, transport, or otherwise bring into the State or release or introduce into the

State any diseased wildlife or other animal that reasonably might be expected to pose a public health or safety hazard as determined by the South Carolina Department of Health and Environmental Control after consultation with the department.

Sec. 50-16-40. Exception to permit requirement for wildlife imported for exhibition purposes.

Wildlife imported for exhibition purposes only by state wildlife departments, municipal zoos or parks, public museums, public zoological parks, and public scientific or educational institutions operated not for profit, and transient circuses are not required to procure a permit under Section 50-16-20. Nothing in this chapter prohibits the department or its duly authorized agents from possessing, importing, or releasing wildlife.

Sec. 50-16-50. Authority to promulgate regulations.

The department may promulgate regulations to effectuate the provisions of this chapter.

Sec. 50-16-60. Exception to permit requirements for certain wildlife imported for sale as pets.

The importation of the following wildlife for sale in the pet trade shall not require a permit:

1. tropical fishes
2. rats and mice
3. rabbits
4. canaries
5. gerbils
6. shell parakeets
7. love birds
8. cockatiels
9. parrots
10. toucans
11. mynah birds
12. finches
13. hamsters
14. guinea pigs
15. reptiles
16. amphibians

The provisions of this section do not privilege the import or possession of any species otherwise protected or regulated by other provisions of this title.

Sec. 50-16-70. Penalties.

A person violating the provisions of this chapter is guilty of a misdemeanor and, upon conviction, must be fined not more than one thousand dollars or imprisoned not more than six months, or both.

shellfish for specified periods at any time during the year when biological and other conditions warrant the action. Nothing in this article may be construed to alter the authority of the Department of Health and Environmental Control to open and close shellfish grounds for public health reasons.

Nothing in this section prevents the removal of shellfish for the purpose of replanting under permit granted by the department. Clams and oysters may be imported during the closed season in this State from other states where the taking and possession of the shellfish is lawful. Each shipment or load of imported shellfish must be properly marked and identified to verify compliance with the provisions of this section.

Any person violating the provisions of this section is guilty of a misdemeanor and, upon conviction, must be punished as provided in Section 50-17-100.

Sec. 50-17-366. Size limit on clams.

It is unlawful to take, harvest, possess, sell, purchase, or import a hard clam of the genus *Mercaenaria* of less than one inch in thickness, measured as the maximum depth of the intact clam from the exterior surface of one valve of the shell to the exterior surface of the opposita valve. A clam of less than the minimum legal size limit specified in this section must be returned alive immediately to the bottoms where found.

It is lawful for a clam hatchery or mariculture operation to have in possession clams of less than the minimum size limit specified in this section and to purchase, sell, or transplant sublegal sized clams upon obtaining a special permit from the department.

Sec. 50-17-367. Shellfish season(s) for mariculture operations.
The department may grant permits to persons who are in mariculture operations to harvest, have in possession, and sell shellfish at any time during the year.

Sec. 50-17-370. Recreational shellfish areas.

The department must maintain areas where bona fide residents of this State may gather, for personal use, not more than two U.S. bushels of oysters in a day. The areas must be designated upon the approval of a majority of the county legislative delegation. The open areas must be located preferably at or near public landings. The department shall clearly mark and identify the open areas so that the public may readily recognize them as open areas. The division is responsible for the maintenance of the signs. Any nonresident gathering oysters in or on such public grounds or resident harvesting for commercial purposes or gathering in excess of the statutory limit set forth above, upon conviction, must be punished as provided in Section 50-17-100.

Sec. 50-17-375. Standard measure for shellfish.

The standard measure for the harvesting, selling, and marketing of shellfish in South Carolina is the U.S. bushel, equal

**Requirements of Shellfish Growout Programs
to Meet Mariculture Designation
(Attachment to Shellfish Mariculture Permit)**

The South Carolina Wildlife and Marine Resources Department issues permits for exclusive rights to coastal bottoms owned or controlled by the State for the cultivation or maricultivation of shellfish. Though similar, the provisions and requirements of permits for culture and those for mariculture are distinguished in law, therefore a distinction must be made in permitting these activities.

Mariculture is defined in South Carolina law as controlled cultivation in confinement of marine and estuarine organisms (Section 50-17-15). Therefore shellfish grown under a mariculture permit must be held in confinement for all or a substantial portion of their growth prior to harvest.

Procedures which maintain shellfish in hatchery and nursery facilities, and later in or under cage, bag, tray, introduced cover, or other physical structures for the entire period of growth meet the confinement requirement of mariculture.

Procedures which include dispersal of shellfish through broadcast, furrowing, or other non-confining means over permitted bottoms for growout as a phase of a program which includes a period of confinement may meet the confinement requirement for a mariculture permit. Prior to dispersal, shellfish must be held in confinement for a period sufficient to allow growth to an average size specified in the permit holder's operations plan and approved by the Department. Dispersal of shellfish following the period of confinement must be witnessed and quantities confirmed by the Department. Records of confirmed dispersals will be referred to by the Department should application for harvest by mechanical means be made subsequently.

Dispersal of shellfish not held in confinement on permitted bottoms by the permittee, regardless of from where or at what size acquired, does not constitute mariculture for the purposes of permitting shellfish mariculture.

A mariculture permit does not afford the permittee rights to naturally occurring shellfish not otherwise provided by law or regulation.

C. Wildlife & Marine Resources

Department

O. Box 167

Columbia, SC 29202

FOR DEPARTMENTAL USE ONLY

Permit Number: _____

Permit Term _____

From: _____ TO: _____

**APPLICATION FOR PERMIT TO
IMPORT PENAEID SHRIMP
FOR AQUACULTURE PURPOSES**

Name of Importer _____ Telephone () _____

List All Owners, Co-Owners or Partners of this Business (Include Social Security Number & Date of Birth) _____

Mailing Address _____
Street City State Zip Code

Species to be Imported _____

Location of Aquaculture Facilities _____

(attach detailed location map)

NOTE: All permits required by local, state and federal entities for the construction and operation of the above aquaculture facilities must be obtained by the applicant and certification must be received from the S. C. Department of Agriculture that all state permits required have been secured prior to the issuance of this permit.)

I have received a copy of the State and Federal laws which regulate production, possession, and marketing of fisheries products. I agree to comply with these laws and permit restrictions and further agree to inspection and sampling by the S.C. Wildlife & Marine Resources Department and/or its authorized agents or other governmental entities which regulate the production and sale of fisheries products and/or their by-products.

Applicant's Signature _____ (Title) _____

Approved by _____ Issued by _____

Date Issued _____ Title _____

C. Department of Agriculture Confirmation _____

(REVISED)

Terms and Conditions

Permit for Importation of Penaeid Shrimp
for Aquaculture Purposes
(herein after referred to as
exotic or imported aquaculture shrimp)
Pursuant to Sections 50-16-10 through 50-16-70,
1976 S. C. Code of Laws, as amended
S. C. Wildlife & Marine Resources Department

November 1990

The attached Permit # _____ for exotic or
imported aquaculture shrimp is hereby granted
to the named permittee subject to the terms
and conditions as set forth below:

A. REPORTING REQUIREMENTS:

1. The permittee shall report to the S. C. Wildlife and Marine Resources Department (SCWMRD) the locations of all impoundments, cages, raceways or other facilities containing exotic or imported aquaculture shrimp pursuant to an attached map, drawing or blueprint to this permit. The S. C. Department of Agriculture shall certify to the SCWMRD that all required permits from county, state and/or federal agencies have been received for the construction and operation of the aquaculture facility before receiving a permit from the SCWMRD. The permittee is required to notify the S. C. Wildlife & Marine Resources Department 30 days prior to the importation of aquaculture shrimp for pre-inspection purposes. Modifications to water control structures, exterior dikes, or other containment device or structure or anything that may affect the integrity of containment structures shall be approved by the SCWMRD in advance. In the event that such modifications require permits from other state or federal agencies, the issuance of such permits shall be verified by the SC Department of Agriculture prior to the modification being undertaken. The SCWMRD must respond to requests by permittees for approval of such modifications within 15 working days of receiving notification and must be notified by the permittee within 30 days of completion of any of the activities listed above.

2. Reportable Items:

A. Records:

The permittee must maintain the following records which shall be kept at the facility and be open for inspection by agents of the Department during business hours:

- (a) Total estimated number of exotic or imported species to include a list of the species, description of species (post larvae, juveniles, adults, etc.), size of the organisms, and suppliers from which the species were obtained to include name, address, and telephone number; and
- (b) Monthly pounds harvested and monthly sales of exotic or imported species.

B. Reports:

The permittee must report: The estimated number (pounds) of live exotic or imported aquaculture shrimp transferred in-state to another entity and the name, location, and permit number of the entity. Prior to the in-state transfer of live or imported aquaculture shrimp to another entity, the receiving entity must possess a permit under these terms and conditions and the transferring permittee must notify the SCWMRD in advance by ten (10) working days prior to making the transfer of a live product. (NOTE: For the transfer of a live exotic or imported shrimp to an out-of-state entity, the permittee must report the transfer to the SCWMRD in advance by ten (10) working days to include the estimated number of pounds, out-of-state buyer with name, address, telephone number and contact person).

B. ESCAPEMENT PREVENTION:

All imported or exotic aquaculture shrimp impoundments having discharge waters which either directly or indirectly enter state waters must contain provisions to prevent escapement. These escapement provisions are as follows:

1. High Ground Pond Screen:

Production ponds that are designed with water control structures (WCS) for the purpose of discharging water must be properly screened to prevent the escape of any exotic or imported aquaculture shrimp. To accomplish this, all WCS must be double screened. This may be accomplished in several ways depending on the type WCS that has been installed. The use of a two screen system will provide a back-up mechanism for the failure of the first screen and allow the maintenance of the two screen system.

The first point at which water is discharged must be screened. A screen must be placed in front of the entrance into the water control device (boards, valve, etc.), of the WCS. This first point discharge may be the first track in a two or more track WCS or the construction of an enclosure unit around the entry of the WCS. This will prevent entry to the WCS in case of failure of the water control device. A second screen may be placed behind the first point discharge screen in a multi-track WCS or at the second point of discharge, such as a screen on top of the overflow of a board type WCS. In addition, the second screen may be in the form of a screen or bag that is placed on each pond discharge pipe. If the ponds drain into a common ditch or canal and this water passes through a culvert, pipe, or fixed discharged structure, this unit may be properly screened and classified as the second screen.

2. Additional Screen:

If the distance from the surface of the water to the top of an open WCS or water control device is less than 12 inches, a mesh or solid cover must be provided to prevent shrimp from jumping over the side of the WCS. If the second screen or bag is attached to the pond outlet pipe or common drain structure (culvert, pipe, discharge structure), a cover for the WCS is not required.

3. Screen Size:

A first point discharge screen mesh size of 600 microns or less is required when stocking post larvae (approximate size 8 mm). The second screen may have a mesh size of 600 microns or less (window screening). The 600 micron mesh screen may be exchanged with a larger mesh size of 1/4-inch when the average shrimp size is 4.0 grams and there are no shrimp in the sample less than 1.0 gram. The permittee will be responsible for determining shrimp size and exchange screens. The shrimp are subject to examination by the SCWMRD at any time.

4. Screen Material:

A variety of screen materials such as fiberglass, plastic, aluminum, nylon mesh bags, etc., have been found to be satisfactory and such screens and bags shall be approved by the SCWMRD on a pre-permit inspection.

5. Tidal Impoundments:

Impoundments that are tidally controlled require a WCS to accommodate large volumes of water from both sides. The measures to prevent escapement in tidal impoundments shall be approved by the SCWMRD in a pre-permit inspection and the requirement for covers to prevent loss of exotic or imported aquaculture shrimp jumping over the side of an open WCS shall also be approved in a pre-permit inspection by the SCWMRD. All tidal impoundments stocked with penaeid shrimp shall not have an exchange of water for a period of 28 days from the date of stocking. The permittee shall notify the SCWMRD prior to an exchange of water in a tidal impoundment after its initial stocking of penaeid shrimp. Upon periodic inspections by the SCWMRD to determine mean size and size distribution, the exchange of screens for a larger mesh size will be allowed. The SCWMRD shall work with appropriate state and federal agencies regarding the inspection and condition of dikes which relate to the containment of penaeid shrimp.

6. CONTINGENCY FOR DISASTER:

Each aquaculture facility permitted for the rearing of exotic or imported shrimp should develop a contingency plan to contain the shrimp in the event of a hurricane, flooding, or other disaster. The permittee may be held responsible for any damages that may result if the shrimp are released as a result of some disaster or system failure and if such release has a demonstrated negative effect on native shrimp or other aquatic populations.

7. WATER CONTROL STRUCTURES:

Unless security is provided as deemed appropriate by the Department, the water control structures of aquaculture facilities under this permit are required to be locked in an appropriate fashion so boards cannot be removed or valves easily opened.

8. OUTSIDE POND HARVEST:

When permittees harvest by using outside of the pond methods such as net bags, external catch basins, etc., the common drain area must be screened to prevent the escape of shrimp lost in the harvest process.

C. COORDINATION:

1. This permit is granted upon the condition that all natural resources related permits or licenses from other agencies, departments, political entities, boards or commissions, and/or political subdivisions have been secured, maintained and/or renewed as may be required for the operation of this facility. The S. C. Department of Agriculture shall certify that all permits from the S. C. State Budget and Control Board, S. C. Coastal Council, and/or the S. C. Department of Health and Environmental Control have been secured prior to the issuance of the permit under this section.

2. All advance notifications, except those required in writing by this permit, shall be made by telephone to the offices of the SCWMRD to be provided to each respective permittee.
3. The S. C. Wildlife & Marine Resources Department shall provide coordination of this permit with the Aquaculture Permit Assistance Office in the S. C. Department of Agriculture in accordance with Sections 46-51-10 through 46-51-30, 1976 S. C. Code of Laws, as amended.

D. INSPECTIONS:

The permittee agrees to the pre-permit inspections required in this permit and further agrees to inspection and sampling by the S. C. Wildlife & Marine Resources Department and/or its authorized agents or other governmental entities which regulate the production and sale of fish and/or their products or by-products for as long as this permit is in effect.

E. NON-COMPLIANCE:

Any non-compliance, deviation, alteration or misrepresentation of the terms and conditions in this permit shall subject a person to the penalty provisions in Section 50-16-70, 1976 S. C. Code of Laws, as amended. No person, firm, corporation, partnership, or cooperative shall be allowed to transfer this permit to any other entity.

F. AMENDMENTS:

The SCWMRD reserves the right to amend, alter, modify, or change the Terms and Conditions of this permit as deemed appropriate, but only after the permittee is given written notification of intent to change the permit and an opportunity for input and appeal.

G. PERMIT ADMINISTRATION:

The administration of the Terms and Conditions of this permit shall be administered as determined by the Executive Director of the S. C. Wildlife & Marine Resources Department.

H. SPECIAL TERMS AND CONDITIONS:

The following Special Terms and Conditions specifically apply to Permit # _____ for exotic or imported aquaculture shrimp:

(Date)

James A. Timmerman, Jr.
Executive Director
S. C. Wildlife and Marine
Resources Department

APPENDIX D

THE IDENTIFICATION OF AQUACULTURE PRODUCTS IN FLORIDA

Assembly Charges:

The goals of the Assembly are to: A) Identify bonafide marine aquaculture producers and products, and B) To recommend policies that will facilitate the promulgation of laws and rules pertaining to exemptions from resource regulations based on tagging, labeling, documentation and licensing.

AGENDA QUESTIONS

1. What are bonafide aquaculture products and who are bonafide aquaculture producers?

Group One:

Marine aquatic plants and/or animals procured at less than a marketable stage, propagated or grown on private, leased or designated lands by permitted individuals who cultivate aquaculture products.

Group Two:

Marine aquatic organisms privately owned and produced for commerce under controlled or semi-controlled conditions. Aquaculture products do not include organisms harvested from the wild for depuration, wet-storage, or relay for purification.

Aquaculture producers are those persons authorized to engage in the production of marine aquaculture products.

Group Three:

Bonafide aquaculture products are marine plants and animals that are produced, processed, possessed or owned by a permitted aquaculture operations that culture such products uer extensive or intensive controlled conditions.

2. What are the benefits of developing a system to identify marine aquaculture products in Florida, and who would benefit from the system?

Group One-Benefits:

1. Marketing and product promotion.
2. Facilitates enforcement and eases regulatory concerns.
3. Quality control/quality assurance-consumer right to know and their safety concerns.
4. Specific identification.
5. Comprehensive data base re statistics, research, development, management and technology.

who:

consumers
regulatory entity
growers
investors
wholesalers/retailers
resource
submerged landowners

Group Two-Benefits:

- o Orderly market.
- o Enforcement of product segregation.
- o Premium quality.
- o Exemptions from natural resource regulation.
- o Consumer confidence re safer handling.
- o Protect natural resource.
- o Genuine Florida grown (aqua certification stamp).
- o Product Pride.
- o Ease of enforcement,
- o Paper trail.
- o Professional standing (ind. recog.).

Who:

public agency
natural resource
regulators and enforcers
consumers
business community
prod.-whole./retail.

Group Three-Benefits:

- o Marketability and quality control.
- o Distinguish aquacultured permitted product versus non-.
- o Prevent illegal harvest wild product.
- o Security:prevebtuib of poaching.
- o Exempt Ag. product from resource regulation.
- o Relieve pressure from natural stock.
- o Facilitate enforcement.
- o Added value.
- o Provide ID to producers and products.
- o Stabilize regulator system and facilitate regulatory mechanism.
- o Stabilize Pricing.

Who:

Consumer and producers
enforcement
researchers
general economy
resource regulators and managers
marketers and dealers

3. What are the disadvantages of developing a product identification system, and who would oppose the development of such a system?

Group One:

increased paperwork/work load
increased costs (producers and regulators)
reduce potential entry into industry
positive/negative perception of agriculture product

who oppose:

foreign suppliers
natural harvesters
wholesalers who obfuscate
-processors
present/future growers
regulators
investors

Group Two:

Technology for marketing (ID)
hassles of paperwork-recordkeeping
cost
concerns re reg,(agency plus implementation and taxpayer) plus producers
(R&D)
not enforceable
may lead to license
negative impact to industry if bad experience with product
counterfeit

Who opposes:

poachers/bootleggers
producers
relayers
non-aquaculturists/commercial fishing ind.
market channels
shippers to Florida (importers)

Group Three:

Red tape (expanded regulations)
expense
complexity

liability of product
marketability
grouping of individual/producers/tags
counterfitting

Comment: Disadvantages vary depending on proper identification.

Who against-Some of following but not all against:

wild harvesters
poachers
wholesalers (not receiving product)(receiving product)
farmers/producers
competors
retailer

4. Are any of the product identification systems used in other states applicable in Florida?

Group One:

All states use papertrails and so does Florida.

Group Two:

Papertrails and shipment tickets

MD-14 digit code required in or out of state, lot species, date, quality on shipping cont.-bill of landing-only aqua culture and Finfish.

Group Three:

genetic markers (Notata claim)

geologic differences (live rock)

proper tagging of containers

serially # systems

permits/licenses

chain of custody documentation

forensics

ID tags for individual animals/ plants

covert tags

biochemical tags

5. Determine the advantages and disadvantages of the following alternative techniques for product identification: (Factors such as technical feasibility, economic feasibility, and enforceability should be considered).

A. Product tagging and marking techniques.

Group One:

Advantages-

ease of enforcement

ownership identity

increased consumer confidence and information

Disadvantages-

technical feasibility

cost prohibitive

product computability

labor intensive

Group Two:

Advantages-

-87(B.P.,MN)

follows all way from producer to retail (consumer)

enforcement

Disadvantages-

cost prohibitive

time and cost of tag=cost of fish

time

not one tag for all species (not all species can be tagged-eg. seaweed.

certain life stages of species difficult to tag

of organisms impractical

labor intensive ? cos

defacement of product

counterfeiting

B. Package labeling techniques.

Group One:

Advantages-

less labor intensive

more willingness to comply

more compatible with other states

Group One ? 5 advantages -continued:

promotes mass identification
increased consumer information and confidence
not harmful to product
more cost effective

Disadvantages-
fraudulent labels
potential of lost tags

Group Two:

Advantages-

tech. feasibility
easy for all types
econ. feasibility-inexpensive in relation to ?
enforcement=product promotion, advertising
segregation of product aquaculture/wild

Disadvantages-

counterfeiting
reuse of container
misrepresentation
discriminatory pricing for shipping
does not end up at consumer

C. Documentation and chain of custody techniques (i.e. paper trails, notification requirements, etc.)

Group One:

Advantages-

industry acceptance
regulatory acceptance
reduce liability
increased quality assurance and control
cost effective
less labor intensive
more accountability

Disadvantages-
facilitates violation
difficulty in notification requirements
more labor intensive for regulatory agency

Group Two:

Advantages-

management of res. made easier
tech simple
cost-effective
continuity of product ID at any part of chain
enf. record retention-quick cks., easily performed
accounting practice cks,

Disadvantages-

minimal advert.
easily separated from product or box
counterfeit

D. Producer identification via licenses or certifications.

Group Two:

If high keep out fly-by-nighters
do away with SAL, SPL
enforce limited entry
illegal operations

Disadvantages-

If high cost agency problems
A,B,C would not work without licenses
Precedent for licensing of ? of aquacult vs. agricult
Many states permitted or lice,-sol prod./honey/deer/tree

Group Three Matrix:

TAG TYPES

APPLICABILITY

1. Genetic Markers-
Notata (claims)
triploid oysters
hybridization

low
moderate
low/moderate

2. Individual tags-
to clams (shellfish)
to fin fish
to live rock
to plants

low to none
moderate to high
~~moderate to high~~ No to Mod
no to low

3. Covert tags-
clams (poaching)
live rock (implants)

low
no to low

4, Biochemical-
shellfish
fish (lack of knowledge)

low

5. Geologic differences:
liverock

high to moderate

Advantages-
natural tag relatively esy to acquire
require minimum training to ID differences

Disadvantages-
require additional training for enforcement to recognise
investment to get dissimilar rock

6. Forensics-
(electrophoresis)

low re intraspecific
high re interspecific

Advantages-
proof positive
current technology
Disadvantages-
intraspecifics difficult
complex
expensive

B. Package labeling technique

1. container tags high

advantages-

existing ,relative low costs (time and dollars),ID to specific areas,trackiblity,
provides credibility

disadvantages-

new tags,increase dollars,counterfeit tags,inability to verify product origin

2. Serial # Tag (bar codes) high

advantages-

lots of information from a # (type of product,origin,vessel,lease #),
verifiable, increased protection, easy to implement by incorporating
existing codes

disadvantages-

increase \$,counterfeit

3. Customized Package/Stamps/Banding high

Advantage-

inhibits counterfeit,protects ID

disadvantage-

cost

C. Chain of Custody Tech.

1. Telephone verification high

advantages-

convenient, workable, existing

disadvantages-

required prior notice,Monday to Friday and not weekends, no 800 # except
on M-F from 8-5pm, local application

2. ID method from harvest to first sale high

verifiable

@ harvest on lease?

3. Origin of stock material (between aquaculturist) high

Advantages-

verify origin,creation of paper trail

4. Wholesale/retail-
verification,papertrail
Disadvantage-
multiple documentation

Note: Chain of custody should follow thou to retailer

D. Producer ID-via license or certifications high

Advantage-

1. SAL 2. Leases 3. SPL

uniformity,verifiability,distinguishes or isolates group

Disadvantage-

SAL only deals with undersized product

Note: Do you want a single license versus multiple licenses? Group Three votes to support a single license.

6. Can bonafide marine aquaculture products be identified through the alternatives listed in question 5) A-D?

Group One:

A. Shellfish-no
liverock-no

B. yes

C. yes

D. yes-producer
no-product

Group Two: and Group Three:

Yes to A-D

7. If so, how should this be implemented?

Group One ranked responses:

1. Self-regulate with oversight
2. Modify existing licensing system
3. create a new aquaculture ID system thou lead agency
4. status quo

Group Two:

B,C,D-all in concert

#5A should be reserved for special cases-
species by species
show B-D-not applicable/useful
considered most stringent costly

Tag type-one most appropriate to species:

Example of species where tagging should be required in addition to
systems of B,C,D-

Manatee,turtle,alligator,tarpon,snook,sturgeon

Additional tagging comments-Marine Patrol should do and maybe Game
and Fish and when does checking stop?... at level of producer,
wholesaler and retailer

(group had a zesty conversation)

Re 5B -

across the board with exception of liverock-

what should be on label?
enforcement data only and leave space for marketing info

Re 5c-

Modify trip ticket data management by:

definitely include license #, permit #, ? #
Can this data be obtained from other states?
modify trip tickets data fir better management
bill of sale
enforcement notification by species (confirm #) -24 hours
Vessel ID
identify legitimate culturists/remove illegal

Re 5d-

vessel ID
SPL endorsement
new type of cert. license to separate industry (aqua vs. wild)
lease ,facility, business plan before or after getting license
KISS-keep it simple
license entitles you to exemptions but not cultivate organisms
prod, ID-register/certificate (annual/five year)

Group Three:

Consensus recommendation to legislature to make recommendation
(industry)..."Technical Advisory Committee to make recommendations
(industry)

Designate lead certifying agency or entity (DEEP received group
consensus over DACS)

Industry certification Committee offered as alternative

8. Who should pay for the implementation of the system?

Group One:

1. Self-regulation-industry
2. government imposed=taxpayers
3. reality-consumers
4. government imposed-industry

Group Two:

Industry fully ????

fee structure:

graduated structure
by industry?

If extra dollars where do they go?

R&D or marketing or lobbying

Private and public sector because license protects producers plus natural resource

benefactors specific

surcharge marketing, R&D

Group Three:

If stays with DEP, current system would not cost additional funds. Full implementation of "alternate" would require additional funds.

License fees to be decided by industry based on level of investment and disposition of funds.

"AQ" license would replace SPL (AQL) (APL)

Berrigans Wallet Fee-CAMEL= Certified Aquaculture Mariculture Enforcement License!