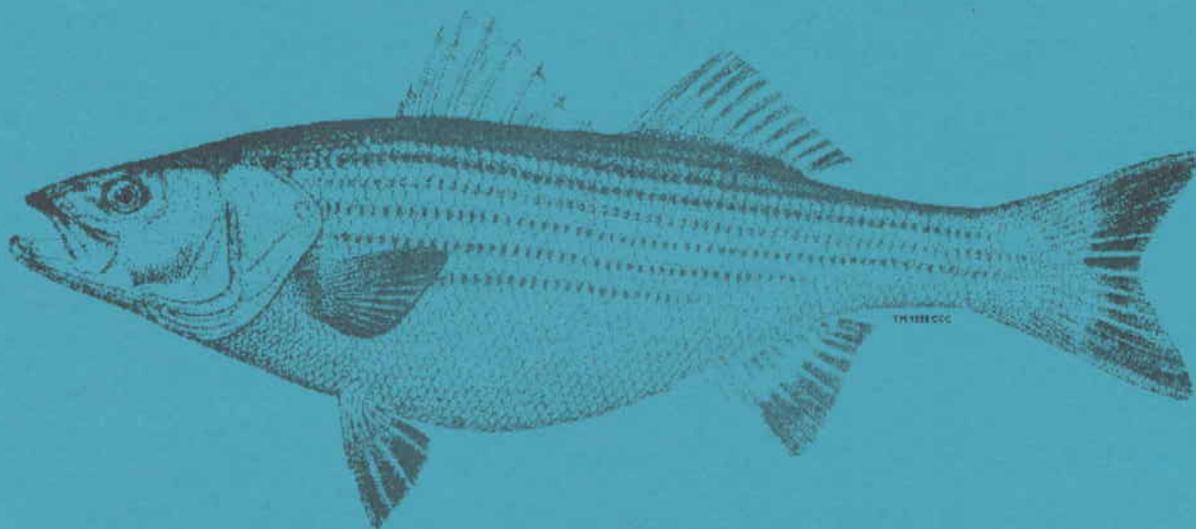


Executive Summary

State of New Jersey

Aquaculture

Development Plan



January 1995

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**The Governor's Task Force Wishes
to Acknowledge Partial Funding
for this Report from the
New Jersey Sea Grant College Program:
A Program Managed by the
New Jersey Marine Sciences Consortium**

EXECUTIVE SUMMARY

STATE OF NEW JERSEY AQUACULTURE DEVELOPMENT PLAN

PREFACE

New Jersey is about to embark on a mission which will establish an Aquaculture Development Plan for a new farming industry in the state. The plan objectives are to expand business opportunities, stimulate private investment and create jobs.

The dwindling availability of New Jersey's natural marine animals and plants for food is a consequence of modern harvesting technologies, pollution, disease and competition from other user groups. Dietary shifts toward non-red meat protein foods has placed added demand and value on marine based products. New Jersey, the Garden State, with its long history in truck farming is well-suited to add aquaculture to its methods for producing food products.

The questions examined by the Governor's Task Force were market driven and focused on New Jersey's resource capabilities to create profitable commercial businesses in fish and shellfish farming, processing and distribution.

The Aquaculture Development Plan presents a compelling case for New Jersey to proceed into aquaculture, statewide, having resolved the following main issues:

The economics of achieving profitable commercial production including: niche markets, distribution, production yields/costs, processing, environmental impact, infrastructure support and land use; the regulatory conflicts stemming from needed protection for the commercial fishery, recreational industry, wild stocks and the environment.

It was found that New Jersey was uniquely situated to support local as well as New York, Philadelphia and export seafood markets with an industry having a potential billion dollar annual sales revenue. The industry could support 10,000 new jobs in production and allied businesses, improve the use of 50,000 upland acres in a manner compatible with environmental concerns, provide an increase of 6000 leased aquatic acres, and stimulate additional high value-added closed aquaculture systems.

Although New Jersey has the natural, human, technical, and financial resources to achieve a successful aquaculture industry, regulatory barriers must be removed to enable aquaculturists to compete in this activity. Specific recommendations are presented that address short, intermediate and long-term needs of the industry balanced with environmental concerns. Regulatory reform, licensing and fees are addressed. Additional issues addressed include public and private participation in market development, funding, training and high quality production.

We advise enactment of an Aquaculture Act responding to specific recommendations detailed in the plan that address the following key points:

1. Define Aquaculture as a component of Agriculture;
2. Designate the Department of Agriculture (NJDA) as the lead state agency for aquaculture with specific responsibilities to support marketing, funding and development activities to build a viable industry;

3. Direct the Department of Commerce and Economic Development (NJDOC) and New Jersey Department of Agriculture to coordinate support for the development of export and domestic distribution channels, and promote access to specialized early state funding through EDA;

4. Direct the Department of Environmental Protection (NJDEP) to implement the required regulatory changes needed for aquaculture and related businesses to compete and prosper, protect the environment and natural resources, provide the necessary services for rapid permitting and leasing, including safe haven development of new processes;

5. Direct the Department of Labor to work with the Department of Agriculture to provide specific work force development programs;

6. Direct the Commission on Science and Technology (NJCST) to support aquaculture training, demonstration, extension services and technology transfer activities (at Rutgers University (RU) and Cumberland County College (CCC)) to ensure that adequate resources are available to New Jersey companies;

7. Establish an industry-government advisory committee in the Department of Agriculture with broad governmental, industry and academic representation to ensure coordination of services;

8. Provide the initial investment for this program as follows:

Entity	Budget	Capital
NJDA	\$250K	
NJDEP	\$100K	
NJDOC	\$100K	\$1,000K EDA revolving loan fund
NJCST	\$250K	
RU, CCC	<u>\$750K</u>	
Total	\$1,450K	\$1,000K

INTRODUCTION

New Jersey has substantial amount of underutilized marine, estuarine, land and freshwater resources available for the development of aquaculture and related industries. In addition, NJ is proximal to the largest consumer market for aquaculture products in the nation. To capitalize on these resources and markets, the Governor of New Jersey created, by Executive Order, the Aquaculture Development Task Force to "design the State Aquaculture Development Plan to provide for and encourage the development and subsequent expansion of an economically viable aquaculture industry while ensuring the integrity and protection of the natural/wild stocks and their habitat". In addition the plan will:

- help stimulate private investment to develop and expand commercial aquaculture
- identify and evaluate job opportunities in aquaculture for individuals displaced from the fishing and shellfishing industries
- enhance business opportunities for New Jersey farmers, commercial fishermen and members of the fish and shellfish processing, marketing and distribution industries
- ensure coordination among state agencies to promote the goals of the Executive Order
- address issues of water withdrawal, wastewater discharge, optimal habitat

conditions, product quality standards, natural resource protection, marketing, research and demonstration, farm pond utilization, coastal development, economic development and education/extension.

PURPOSE OF THE PLAN

The New Jersey Aquaculture Development Plan:

- Identifies the current status of the industry within the state,
- Examines the constraints to private sector aquaculture development,
- Formulates a strategy to remove or reduce the constraints,
- Outlines a realistic development program for private aquaculture, and
- Provides for appropriate public sector assistance in its development.

DEFINITION OF AQUACULTURE

The committee has found that the lead sentences to the the United Nations Food and Agriculture Organization (FAO) definition of aquaculture as stated below is the best available and should be used; **"The farming of aquatic organisms, including fish, molluscs, crustaceans, and aquatic plants. Farming implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc. Farming also implies corporate ownership of the stock being cultured"**.

RELATED AQUACULTURE BUSINESSES

The committee recognizes that the following businesses are essential for the full development of aquaculture in New Jersey: processing, warehousing, distribution, feed production, feed additives, and equipment suppliers. In addition, there are a number of commercial activities that are associated with aquaculture, but are more appropriately considered as steps in market preparation rather than aquaculture. These activities are crab shedding, depuration, and relay of shellfish and live holding or display facilities for fish and shellfish. We do not include these related businesses explicitly within the aquaculture definition. However, because they use equipment and technologies similar to those of aquaculture, they should be included in some aspects of the plan, such as financial incentives, to the extent these businesses establish a direct link to aquaculture.

AQUACULTURE IN NEW JERSEY

The committee has found that aquaculture in New Jersey is constrained by:

- Lack of financial and tax incentives for start-up and developmental operations.
- Lack of single lead government agency with the responsibility to develop and advocate aquaculture in the state.
- Lack of a comprehensive and integrated permitting structure to recognize and encourage aquaculture.
- Lack of access to traditional financial markets.
- Lack of basic financial information.
- Lack of detailed marketing advice.
- Lack of educational opportunities.
- Lack of a technology transfer facility that can apply the latest advances in aquaculture research to New Jersey's economic, social and environmental conditions.

RECOMMENDATIONS

Recommendations have been developed by the committee to address these constraints. A summary of these recommendations is provided in this section. More detailed information on each recommendation, including guidance on those that are essential to immediate development of the industry and other aspects of aquaculture, is provided in Volume II and its summary.

We have determined that, if these recommendations are acted upon quickly, an environment will be created to allow New Jersey businesses to immediately expand into the fastest growing segment of agriculture and simultaneously develop the only method we have for increasing our supplies of high quality fish and shellfish beyond that available from natural stocks. Timely development of the industry to secure markets is essential and in the short term could result in:

- Creation of 2,250 jobs in production of aquaculture products.
- Annual revenue of \$150,000,000.
- Utilization of 10,000 acres of underutilized upland.
- An increase of 1,500 acres of aquatic leases.

Ultimately aquaculture in New Jersey could grow to encompass:

- Creation of 7,500 jobs in production of aquaculture products.
- Annual revenues of \$750,000,000.
- Utilization of 50,000 acres of upland.
- An increase of 6,000 acres of aquatic leases.
- Substantial production capabilities from closed systems.

LEGISLATURE

The New Jersey State Legislature should affirm its support for development of all forms of aquaculture and related industry in the state through the passage of a New Jersey Aquaculture Act. This act should be designed to create an economically viable and vibrant business environment within the state and should include: 1) the modified FAO definition of aquaculture, 2) designation of the New Jersey Department of Agriculture (NJDA) as the lead agency for aquaculture marketing, promotion, advocacy and business development in New Jersey, 3) clearly identify aquaculture as a component of agriculture, 4) recognize and continue the traditional regulatory role of the New Jersey Department of Environmental Protection (NJDEP) in public waters, 5) specify the tax and financial incentives for business start-up, 6) recognize the Aquaculture Technology Transfer Center (ATTC) comprised of the Multispecies Aquaculture Demonstration Facility (MADF) at Rutgers University and the Aquaculture Training and Information Center (ATIC) at Cumberland County College, as the primary academic unit for aquaculture education, extension, demonstration and research in the state, 7) fully fund the faculty and staff for ATTC operations, 8) direct Rutgers Cooperative Extension to expand its services and provide funding for Extension positions in order to fully utilize the potential of the ATTC, 9) appropriate funding for staffing and support to facilitate aquaculture development through state agencies and commissions to the ATTC.

THE GOVERNOR

The Governor should direct the NJDA to work with NJDEP, and the Departments of Commerce (NJDOC) and Health (NJDOH) to formulate appropriate Memoranda of Agreement (MOA's) to facilitate the permitting process. Because this is an emerging

technology, the process should include the establishment of a standing committee chaired by the NJDA including *ex officio* members from the above agencies, but with voting members nominated by industry organizations (to be appointed by the governor), to address individual issues that are not covered in the MOA's. These memoranda should be developed and implemented, following passage of the enabling legislation, within the times indicated in Volume II. Advice for the formulation of MOA's should be solicited from both academia and industry.

THE DEPARTMENTS OF AGRICULTURE, COMMERCE, ENVIRONMENTAL PROTECTION AND HEALTH

The NJDA, in conjunction with NJDEP, NJDOH, NJDOC, academia and the private sector, should develop a guidance document including Best Management Practices (BMP's) to provide guidelines for active and potential aquaculturists and regulators. The purpose of this document will be expedite the development of aquaculture and remove or reduce barriers to its development in New Jersey. Specifically, the guidance document should address:

- 1) Development of a general aquaculture application to identify which additional permits, if any, will be necessary based on the size, location and nature of the operation.
- 2) Establishment of BMP's for all aquaculture operations and specific BMP's for aquaculture leases (intertidal and water column use) including size, duration and criteria for performance.
- 3) Establishment of reasonable aquaculture fee structures, including application fees, lease fees and permit costs while conveying the necessary degree of exclusivity to minimize risks due to pollution, vandalism, theft and other forms of encroachment.
- 4) Development of a mechanism to permit aquaculture sites to be developed on private, non-wetland areas, including an exemption from being designated a wetland by virtue of subsequent growth or invasion of aquatic organisms. This action should be conducted in consultation with the Soil Conservation Service (SCS).
- 5) Establishment of specific soil erosion and sediment control BMP's to make aquaculture compatible with other agriculture uses, in consultation with the SCS.
- 6) Establishment by the NJDEP, in conjunction with NJDA, academia and the private sector, of a cost effective permitting procedure for the possession, importation, and transport of all aquaculture species, stipulating the culturist's right to exclusive ownership.
- 7) Identification of the role of NJDEP, with NJDA, academia and the industry in critically reviewing regulations that restrict commercial aquaculture of commercially exploited species and game fish, and any regulations that might affect removal of predators from aquaculture sites. This review should culminate in recommendations on economically viable methods to alleviate unnecessary impediments.
- 8) Development of recommendations that should be developed to provide mechanisms for exempting, to the extent feasible, specific types of aquacultural

practices from rules and regulations regarding gear, season, possession, and size of wild harvest, while assuring the integrity and protection of the natural stocks and their habitat.

9) Designation of aquaculture as a preferred water use when allocation of fresh and saline surface and ground waters are considered. Allocation of nonpotable water for aquaculture should be encouraged.

10) Establishment of BMP's for effluent discharge based on source and receiving waters as well as the type of aquaculture system being considered. These should specifically define terms such as "modify", "pollutant", etc. with particular regard to aquaculture. Clearly defined thresholds and limits will be applied as criteria for granting permit exemptions.

11) Development of specific procedures, to the extent feasible, to exempt farm-raised products from existing sales restrictions focused on wild stock, while assuring the integrity of natural/wild stocks and the habitat.

THE DEPARTMENT OF AGRICULTURE

In addition to the above activities the NJDA shall:

1) Develop a Standing Aquaculture Advisory Council to advise the NJDA and other State agencies on aquaculture matters.

2) Examine forms, rules etc. to assure that once aquaculture is clearly recognized as an integral component of the State's agricultural community by the Governor, Legislature and Secretary of Agriculture, all grant programs including financial and insurance that currently apply to agriculture shall become available to aquaculture.

3) In conjunction with USDA and the National Association of State Aquaculture Coordinators, the NJDA shall develop a Wholesale Market Report for aquacultured products using the model developed by the Maryland Department of Agriculture.

4) Assist aquaculturists and seafood producers in developing a commodity group that could be incorporated as the industry representative to the State Board of Agriculture.

5) With Rutgers Cooperative Extension, assist the aquaculture industry in promoting its products through the establishment and use of a trademark and other specialized marketing efforts equivalent to the New Jersey Fresh program.

6) With Rutgers Cooperative Extension and NJDOH, assist the industry in development of product safety and quality control standards and production specifications. Standards for processing, transporting and marketing products should be developed based on established quality assurance principles.

FINANCES, MARKETING AND THE BUSINESS ENVIRONMENT

A number of financial and marketing services will become available once aquaculture is declared to be agriculture. The Committee recommends that:

- 1) Public revolving loan funds, start-up and state funding programs should be examined to nurture the developing industry. Where necessary, these programs should reflect aquaculture's long production cycle.
- 2) The NJDA, with advice from NJDOC and industry, should develop a mechanism for tax credits or reduced loan payments until a positive cash flow can be established.
- 3) The NJDA, with the assistance of Rutgers Cooperative Extension Service and the NJ Sea Grant Program, should assist aquaculture producers in obtaining coverage under the Federal Crop Insurance Program.
- 4) The NJDA, in conjunction with other agencies should collect, analyze and publish information about the existing seafood market size, structure and function as well as the market potential for aquaculture products in New Jersey and surrounding states. Emphasis should be given to competing products from outside New Jersey.
- 5) The NJDOC, NJDA, NJDOH and NJDEP should examine rules and regulations concerning the sale, transportation and marketing of fish and shellfish to determine their implications for aquaculture.
- 6) The Rutgers Cooperative Extension and the NJDA should provide assistance to aquaculturists interested in developing coordinating arrangements, including producer cooperatives, joint ventures, market orders and quality assurance programs.

CLIENT SERVICE DELIVERY PROGRAMS

Education, technology exchange and research require the full implementation of the ATTC. These activities are the cornerstone for applying aquaculture technology to New Jersey's emerging aquaculture industry. The committee found that:

- 1) A secure source of funding for the operations of the ATTC, which is comprised of the MADF at Rutgers and the ATIC at Cumberland County College, is needed.
- 2) The MADF should emphasize demonstrations that are recommended by an industry advisory board.
- 3) Training of extension agents should be an integral part of the MADF.
- 4) The Rutgers Cooperative Extension program should develop a proactive plan for developing aquaculture extension services within the state. This program should emphasize commodity groups in aquaculture in much the same way commodity groups are emphasized in agriculture. These activities should be integrated with existing and developing services at ATTC and the state hatcheries.
- 5) The State Commission on Science and Technology and representatives from industry should review the Fisheries and Aquaculture Technology Extension Center's activities to determine how that Center can more effectively respond to problems identified by industry.
- 6) The state, through the Department of Labor (NJDOL), should consider a special

fund to support specialized training of aquacultural workers.

7) Academic degree programs should be strengthened to provide the education and training necessary for the growth of aquaculture. Cooperative programs among the state's academic institutions should be encouraged.

8) The technology transfer and research capabilities of the state fish hatcheries at Pequest and Hackettstown, should be reviewed to avoid duplication with the ATTC with support for continuing programs at these facilities provided.

8) Programs for young people, such as those offered by 4-H, FFA, Tech Prep, and Project Tomorrow, should be broadened to introduce New Jersey's youth to the opportunities presented by aquaculture.

9) A program of specialized training courses should be offered on a rotating basis throughout the state. These could be offered as Continuing Education Units, or "In-Service-Training" for educators, farm managers, lenders and other interested groups. This program should coordinate current ATTC programs with those of the Cooperative Extension and the state hatchery.

10) The University and College systems should review faculty and staff expertise which could be applied to aquaculture. Faculty with identified interests should be encouraged to develop a working relationship with the ATTC.

CONCLUSIONS

These recommendations summarized above are designed to encourage new investment, create jobs, and produce an environment in which competitive businesses will develop. The Aquaculture Development Task Force recommends that these recommendations be implemented by statute as soon as possible to foster the development of an aquaculture industry in New Jersey. In addition, technology exchange and training are essential to lend confidence to and support for the continued viability of these newly formed enterprises.

CHAPTER 1. INTRODUCTION

1.1 Purpose of Plan

The Aquaculture Plan for the State of New Jersey will provide recommendations to ensure that the state recognizes commercial aquaculture as an important economic activity and a significant source of employment. As a consequence of this recognition, state agencies, commissions and other entities provide the necessary support and regulatory framework to enhance and ensure the continued viability of aquaculture enterprises within the state.

1.2 Definition of Aquaculture

The definition of aquaculture as set forth by the Food and Agriculture Organization of the United Nations (FAO) states:

"Aquaculture is the farming of aquatic organisms, including fish, molluscs, crustaceans and aquatic plants. Farming implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc. Farming also implies individual or corporate ownership of the stock being cultured. For statistical purposes, aquatic organisms, which are harvested by an individual or corporate body that has owned them throughout their rearing period, contribute to aquaculture, while aquatic organisms, which are exploitable by the public as a common property resource with or without appropriate licenses, are the harvest of fisheries."

The first three sentences of this definition are the most appropriate for New Jersey, and we have selected them to be used throughout this document. The definition of aquaculture for New Jersey is as follows: **Aquaculture is the farming of aquatic organisms, including fish, molluscs, crustaceans and aquatic plants. Farming implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc. Farming also implies individual or corporate ownership of the stock being cultured.**