

LOUISIANA PLATFORMS FOR MARICULTURE TASK FORCE

Final Report of Findings and Recommendations to the Louisiana Legislature and Governor

Prepared by

Louisiana Department of Natural Resources

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TABLE OF CONTENTS

| | PAGE |
|---|------|
| RECOMMENDATIONS | 3 |
| TERMS AND ACRONYMS | 4 |
| FINAL REPORT | 5 |
| Summary of Findings and Recommendations | 5 |
| Platforms for Mariculture Task Force Overview | 5 |
| Findings and Recommendations | 5 |
| Conclusion | 10 |
| APPENDICES | |
| Appendix A Louisiana House Concurrent Resolution No. 176 | 11 |
| Appendix B Platforms for Mariculture Task Force Members | 12 |
| Appendix C Platforms for Mariculture Task Force Workgroup Volunteers | 13 |
| Appendix D CRS Report for Congress on Open Ocean Aquaculture | 14 |
| Appendix E U.S. Department of Commerce Report on Marine Aquaculture | 15 |
| Appendix F Proposed Federal Rigs to Reefs Act of 2003 | 16 |
| Appendix G Task Force Economic Sustainability Assessment Considerations | 17 |
| Appendix H Grace Mariculture Project Information | 18 |
| Appendix I State and Federal Agency Distribution List | 19 |

RECOMMENDATIONS

The Platforms for Mariculture Task Force (Task Force) recommends the following actions be considered by the Louisiana Legislature and Governor to encourage utilization of oil and gas production platforms for mariculture purposes in the Gulf of Mexico (GOM). The basis for recommendations are provided in the Final Report contained herein.

- 1) The progression of proposed federal legislation and policy initiatives for GOM Exclusive Economic Zone (EEZ) mariculture activities should be aggressively monitored to assess implications on the development of a mariculture industry in Louisiana. State agencies directed by House Concurrent Resolution (HCR) 176 to serve on the Task Force should remain in contact with each other, the Legislature and the Governor's Office to continue open dialogue on the status of these federal activities.
- 2) As a matter of priority, it is recommended that various solutions for mitigating liability issues regarding utilization of production platforms for mariculture purposes in state jurisdictional waters be identified, hereafter referred to as "liability solutions".
- 3) In conjunction with identifying liability solutions, it is recommended that the appropriate Louisiana House and Senate Committees review the possibility of enacting legislation, similar to the proposed Federal Rigs to Reefs Act of 2003, to provide state incentives for oil and gas companies to allow the concurrent use of operating production platforms located in Louisiana waters for mariculture purposes.
- 4) Similar to the progression of artificial reef development policy in Louisiana, it is further recommended that any initiatives for enactment of state legislative action regarding use of production platforms for mariculture take into account the development of related federal legislation.
- 5) It is recommended that data and reports derived from the Grace Mariculture Project and similar offshore mariculture projects, both domestic and foreign, be reviewed analytically and collated to expand our existing knowledge base regarding the use of production platforms for mariculture purposes. If deemed necessary, efforts to establish a similar mariculture research project in GOM waters off the coast of Louisiana to address, where applicable, voids in scientific knowledge relative to offshore Louisiana GOM waters should be initiated.
- 6) Based on development of liability solutions, the need for a comprehensive study on the economic feasibility of developing a platform-based mariculture industry in Louisiana should be evaluated. A comprehensive study should assess any impacts of a Louisiana platform-based mariculture industry on other segments of the state's economy such as existing commercial and recreational fisheries and support industries as well as the potential development of additional, new industries and the expansion of existing fish processing plants and others such as equipment manufacturers and suppliers.
- 7) The Task Force recommends the exclusive use of native species derived from Gulf of Mexico stock for any mariculture activities in GOM waters.
- 8) The Task Force recommends that any practice that involves stocking finfish into the wild not be considered at this time.
- 9) Additional research is recommended to determine if oyster depuration operations using production platforms would pose structural concerns and to identify any capacity limitations. Coupled with liability solutions, it is further recommended that the economic feasibility of oyster depuration using offshore GOM production platforms be studied.

TERMS AND ACRONYMS

CRS - Congressional Research Service

EEZ - Exclusive Economic Zone

FDA - U. S. Food and Drug Administration

GOM - Gulf of Mexico

HCR - Louisiana House Concurrent Resolution No. 176

HR - U. S. House of Representatives

Net Pen Culture - The practice of cultivating fish in a confined environment constructed of nets, frames to maintain the net shapes, and with facilities for management of stocking, monitoring, feeding, and harvest operations. Net pens are structures suspended within the water column in the coastal waters or open ocean. Sometimes the term "cage" is used usually meaning a rigid small framed structure covered with netting.

NOAA Fisheries - National Oceanic and Atmospheric Administration

Ornamental Fish - Fish sold for the aquarium trade.

Oyster Depuration - Oysters are sometimes taken from a site where bacterial contamination (e.g., *V. vulnificus* contamination) occurs to another less contaminated site where they are allowed to rest for some time until they have purged themselves of the bacteria to a legally safe level. This is referred to as oyster depuration.

Platform Sea Farming - The sea farm concept is a broad-based application of open ocean mariculture which could involve multi-faceted mariculture operations in part or as a whole system. Sea farming primarily involves the release of juvenile fish into the marine environment for eventual harvest, but may also include other mariculture operations such as net-pen culture. For purposes of discussion of the Task Force, sea farming means utilizing and / or installing a complex of decommissioned platforms and "artificial reefs" on the sea floor, stocking the area with juvenile fish, growing the juveniles to harvestable size, and harvesting them.

Vibrio vulnificus - *Vibrio vulnificus* is a bacterium that can cause severe illness or death in some people who eat raw oysters or clams. Research shows that *Vibrio vulnificus* is found in oysters and clams from warm waters such as the Gulf of Mexico especially during the summer months.

FINAL REPORT

Summary of Findings and Recommendations

Platforms for Mariculture Overview

The Platforms for Mariculture Task Force (Task Force) was created following passage of Louisiana House Concurrent Resolution No. 176 (HCR 176). The resolution was adopted during the 2004 Regular Session of the Louisiana Legislature. HCR 176 directed the Task Force to study the following aspects of utilizing offshore oil and gas platforms for culturing marine organisms in the development of a Louisiana mariculture industry in the Gulf of Mexico (GOM): 1) economic feasibility and impact on other segments of the economy, 2) environmental impact and 3) regulatory considerations. Delivery of a written report of the findings and recommendations to the Governor and Legislature by January 31, 2005 was required.

The study focused primarily on five (5) mariculture activities which could potentially utilize Louisiana GOM offshore platforms for culture operations. Mariculture activities of specific interest included: 1) net-pen culture; 2) oyster depuration; 3) ornamental fish; 4) coral and sponge harvest, and 5) platform sea farming.

During the study, voluntary workgroups made up of a number of experts in fields related to mariculture assisted with gathering information on economic, social, environmental and regulatory considerations pertinent to the development of GOM offshore platform-based mariculture operations. Workgroup participants met periodically from September 2004 to January 2005 and consulted with business, academic specialists, private organizations, the staffs of members of Congress and government agencies, including the Department of Commerce, the Department of the Interior, and the Department of Energy to advise Task Force members on issues pertinent to the objectives of HCR 176. Five (5) public meetings were held during this time period to discuss relative issues in the development of findings and recommendations.

Presented as follows is a summary of findings which provides the basis for the recommendations of the Task Force.

Findings and Recommendations

The creation of the Task Force is very timely, since efforts at the federal level, as well as internationally, are currently underway to address the technical, legal and regulatory issues impacting the development of mariculture as an industry world-wide and in the GOM Exclusive Economic Zone (EEZ).

On August 18, 2004, the Congressional Research Service (CRS) published the CRS Report for Congress on Open Ocean Aquaculture, defined therein as “rearing of marine organisms under controlled conditions in the U.S. Exclusive Economic Zone”, often referred to as “mariculture”. The six (6) page CRS report includes a general overview of mariculture and provides insight into current economic, regulatory, social, environmental and technical issues relative to the development of mariculture operations in the EEZ.

The issues reported in the CRS Report are very similar to those which surfaced during Task Force workgroup discussions on platform-based mariculture. The CRS reported that EEZ mariculture “is seen as a viable option for supplying consumer demand for marine products while avoiding inshore user conflicts and addressing the

growing seafood trade deficit”. Justification for initiating mariculture activities within the EEZ was previously provided in a 2002 publication issued by the Department of Commerce, National Oceanic and Atmospheric Administration - National Marine Fisheries Service entitled “The Rationale for a New Initiative in Marine Aquaculture”. Impediments which need to be addressed or recognized in the course of the development of the various types of mariculture in the EEZ were also listed in the CRS report. Impediments identified in the report include substantial initial investment costs, multi-agency permitting, facility technological uncertainties, social concerns and environmental impacts. These impediments would apply to platform-based mariculture in both state territorial waters and the EEZ.

According to the federal officials contacted by Task Force workgroup participants and the CRS report, several federal efforts have been initiated to address regulatory issues confronting the development of mariculture in the EEZ. These federal efforts will lend strength to any efforts which the State of Louisiana decides to undertake regarding platform-based mariculture. The National Oceanic and Atmospheric Administration (NOAA) plans to submit draft legislation, i.e., the National Offshore Aquaculture Act, to the Office of Management and Budget that is intended to establish long-term ocean tract leasing, assist in securing project financing and streamline the permitting process. It was further reported that NOAA Fisheries and the Gulf of Mexico Fishery Management Council are both working toward developing policy to address technological, social and environmental issues associated with establishing mariculture projects in the EEZ. Also discussed in the CRS report was the introduction of the federal Rigs to Reefs Act of 2003 (H.R. 2654). H.R. 2654 proposed to authorize the use of decommissioned offshore production platforms for mariculture purposes in the EEZ. The bill contained provisions which would have exempted oil and gas companies from platform removal requirements and offered tax credit incentives for using platforms for mariculture.

The outcome of the federal activities detailed in the CRS report and summarized herein will have an impact on the intentions and objectives of HCR 176.

1) It is therefore recommended that the progression of the aforementioned federal activities be aggressively monitored to assess implications on the development of a platform-based mariculture industry in Louisiana. State agencies directed by HCR 176 to serve on the Task Force should remain in contact with each other, the Legislature and the Governor’s Office to continue open dialogue on the status of these federal activities.

It appears that federal efforts are progressing to encourage use of production platforms for mariculture operations in the GOM EEZ. However, production platform liability issues such as transfer of ownership and financial responsibility (platform maintenance, removal, insurance and bonding) represent two of the most significant legal and economic impediments remaining to be resolved at the state and federal levels for the mariculture activities included in the Task Force study. One conceptual solution to address these issues which was discussed during the Task Force study is the possibility of applying existing state and federal legislation originally pertaining to incentives for the use of land for industrial parks and research parks to specified GOM areas. Further inquiry on this concept would be necessary to determine applicability to GOM production platform mariculture.

2) As a matter of priority, it is recommended that various solutions for mitigating liability issues regarding utilization of production platforms for mariculture purposes in state jurisdictional waters be identified, hereafter referred to as “liability solutions”.

It is understood that similar efforts to identify liability solutions are currently under development at the state level for other alternative uses of platforms such as wind energy.

In addition to liability, issues such as leasing terms and conditions, including platform removal obligations in state jurisdictional waters, and the applicability of the public trust doctrine (e.g., privatization of, or limited access to fishery resources in, GOM waters) will need to be resolved. Primary importance should be given to a continued dialogue in this area between stakeholders and relevant federal and state agencies.

3) In conjunction with identifying liability solutions, it is recommended that the appropriate Louisiana House and Senate Committees review the possibility of enacting legislation, similar to H.R. 2654, to provide state incentives for oil and gas companies to allow the concurrent use of operating production platforms located in Louisiana waters for mariculture purposes.

During the 1980's, coordination of state and federal efforts toward the establishment of artificial reef development policy resulted in the passage of the National Fishing Enhancement Act of 1984 followed by the Louisiana Fishing Enhancement Act passed during the 1986 regular legislative session, which created the Louisiana Artificial Reef Program managed by the Louisiana Department of Wildlife and Fisheries.

4) Similar to the progression of artificial reef development policy in Louisiana, it is further recommended that any initiatives for enactment of state legislative action regarding the use of production platforms for mariculture take into account the development of related federal legislation.

It is well documented that international commercial mariculture operations in open ocean environments have been technically and economically sustainable. Until recently, the United States has lagged behind in both mariculture technology and scientific research. On the domestic front, published literature regarding mariculture operations, whether commercial or otherwise, in the open-ocean environment is limited and needs to be supplemented through additional research activities or by drawing upon the experience of other countries. One particular US study of interest was completed in 2001 by Waldemar Nelson International, Inc. of New Orleans. This engineering company reported that use of offshore production platforms for net-pen culture of red drum would indeed be technically feasible. Advancements in mariculture technology have taken place since 2001, especially in the area of the increased survivability of net-pens in hurricanes. However, the documented knowledge base of both domestic and international mariculture operations specifically utilizing offshore oil and gas platforms is very minimal regarding the economic feasibility and environmental impact of such operations.

The Task Force is aware of only three (3) previously attempted small-scale net-pen US-based mariculture research projects utilizing standing GOM offshore platforms. These attempts were apparently not successful, for various reasons. Thus, conclusive, meaningful data to assess the economic feasibility and environmental impact of these or similar future operations specifically in this region is not yet available and needs to be supplemented. On the other hand, it is known that a privately funded mariculture research project focused primarily on net-pen culture operations (the Grace Mariculture Project, California) designed to assess the feasibility of using standing offshore platforms for the sustainable development of a mariculture industry does exist. The investigators are apparently currently pursuing permits to initiate operations in the fall of 2005.

Considering the lack of economic assessment information available for the five (5) mariculture activities of interest, the Task Force examined the use of models to assess the economic feasibility of GOM offshore production platform mariculture operations in Louisiana jurisdictional waters. Following extensive effort, it

was concluded that, without adequate existing input data and sufficient time to develop defensible assumptions, use of economic models during the Task Force study was not prudent.

Utilization of standing platforms located within Louisiana jurisdictional waters for active culture of presently marketed species, particularly net-pen culture operations, would probably be limited due primarily to unsuitable water quality and depth conditions resulting from Mississippi River discharge and the shallow continental shelf. Thus, utilization of standing platforms for net-pen culture off coastal Louisiana would most likely occur in federal GOM waters where more favorable environmental conditions exist.

Since the vast majority of geographical areas of the Gulf off of coastal Louisiana with favorable environmental conditions (clear, deep water) for active culture operations are located considerable distances offshore, negative environmental impacts to sensitive coastal Louisiana environments would not be expected to result from normal operational pollutants such as food, fecal matter, therapeutics, etc. associated with federal GOM net-pen culture operations. Moreover, most operational environmental concerns associated with net-pen culture should be adequately minimized or mitigated through proper site selection protocol examining, at a minimum, existing water quality, depth and currents, hypoxic zones and nearby surrounding ecological systems. However, the lack of existing environmental monitoring data specific to the use of oil and gas platforms creates a void in scientific knowledge, thereby leading to uncertainties.

5) It is recommended that data and reports derived from the Grace Mariculture Project and similar offshore mariculture projects, both domestic and foreign, be reviewed analytically and collated to expand our existing knowledge base regarding the use of production platforms for mariculture purposes. If deemed necessary, efforts to establish a similar mariculture research project in GOM waters off the coast of Louisiana to address, where applicable, voids in scientific knowledge relative to offshore Louisiana GOM waters should be initiated.

6) Based on development of liability solutions, the need for a comprehensive study on the economic feasibility of developing a platform-based mariculture industry in Louisiana should be evaluated. A comprehensive study should assess any impacts of a Louisiana platform-based mariculture industry on other segments of the state's economy such as existing commercial and recreational fisheries and support industries as well as the potential development of additional, new industries and the expansion of existing fish processing plants and others such as equipment manufacturers and suppliers.

One of the more prominent environmental issues associated with mariculture operations considered by the Task Force is genetic pollution, i.e., species escapement and the introduction of foreign genes into a local gene pool. It was concluded that only species found locally in the environment be used for offshore mariculture, and that stock be derived from local natural populations.

7) The Task Force recommends the exclusive use of native species derived from Gulf of Mexico stock for any mariculture activities in GOM waters.

The Task Force did not identify any other significant environmental issues associated with coral and sponge mariculture operations, i.e. harvest and culture activities, using production platforms in the GOM. In addition to genetic pollution, by-catch release mortality from ornamental fish harvest operations at GOM production platforms may be a concern in certain locations.

There are currently no known sea farm mariculture operations occurring in any waters of the United States. The availability of applied scientific knowledge of sea farm mariculture is primarily derived from operations located off of the coast of Japan, which release fish into the wild for feeding and subsequent harvest. Conceptually, utilization of GOM production platforms for sea farm mariculture would include a broad range of diverse environmental interactions, including wild and released species interaction. However, there is no evidence that stocking fish into marine environments enhances natural stocks.

The Louisiana Department of Wildlife and Fisheries and the Louisiana Wildlife and Fisheries Commission have the constitutional and statutory mandate and authority to manage fisheries and supporting habitats within the state's jurisdiction. They do not endorse fish stock enhancement through release of fish into marine environments. Because fisheries in the GOM are interjurisdictional, the federal government and adjacent states would be vitally interested and involved in any such proposal. Ownership of stock released into the wild and of any subsequently harvested stock would be contested. Existing stakeholders have strongly opposed introducing other competing interests into quota-based harvest allocation systems. The state is obligated to ensure that all allocations of fish harvest are fair and equitable.

As with all platform-based culture techniques, other users could lose access to the structure. The release of organisms could change the genetic make-up of natural stocks. Further, in addition to those already mentioned other regulatory and legal issues exist.

Although there may be potential for the future use of GOM production platforms for sea farm mariculture, additional time and resources would be necessary to study the complexities of such a system, especially the development of the concept within state jurisdictional waters.

8) The Task Force recommends that any practice that involves stocking finfish into the wild not be considered at this time.

Treatment (purification) of oysters via an offshore oyster depuration system using production platforms may be a viable alternative to current purification techniques. Research from the Louisiana Sea Grant suggests that suspending containers of live mature oysters into open gulf waters for an extended period of time is effective in purging oysters of the harmful pathogen, *Vibrio vulnificus*. This bacterium has represented a major threat to the oyster industry, since the industry's inception, particularly where consumption of raw product is concerned. The application of this technology in offshore waters appears to have potential for positive contributions to the oyster industry. Production platforms located in Louisiana jurisdictional waters may prove useful as support structures for oyster depuration technology. However, effects on platform structural integrity, if any, which may result from the additional weight and drag forces of suspending baskets of oysters into the water column are unknown. Companies seeking to carry on such a business may find it necessary to seek U.S. Food and Drug Administration (FDA) approval for this process. Furthermore, the economic feasibility of using production platforms for oyster depuration is unknown.

9) Additional research is recommended to determine if oyster depuration operations using production platforms would pose structural concerns and to identify any capacity limitations. Coupled with the previously mentioned liability study, it is further recommended that the economic feasibility of oyster depuration using offshore GOM production platforms be studied.

Conclusion

It is reported that the central GOM shelf contains the highest density of oil and gas production platforms in the world. Therefore, it is practical to consider that the use of existing GOM production platforms could prove beneficial in expediting the development of a mariculture industry in Louisiana. Recognizing inherent complexities, efforts to aggressively pursue and timely disseminate additional knowledge gained from ongoing and near future commercial and pilot mariculture projects relative to use of production platforms for mariculture operations would effectively and fundamentally guide state policy decisions.

Concurrently, increased opportunities for the utilization of GOM production platforms in the development of a Louisiana mariculture industry would result through state and federal legislative efforts to address major impediments including production platform liability costs. The creation of the Louisiana Artificial Reef Program could serve as a model in the development of a Louisiana production platform mariculture policy considering that such policy would involve both federal and state jurisdiction. Furthermore, production platform liability costs to mariculture enterprises may be reduced by sharing those costs jointly with other potential platform users such as liquefied natural gas storage and wind energy ventures. A Louisiana production platform mariculture policy should encourage the opportunity for such arrangements to exist.

APPENDIX A

LOUISIANA HOUSE CONCURRENT RESOLUTION NO. 176

APPENDIX B

PLATFORMS FOR MARICULTURE TASK FORCE MEMBERS

| | |
|-------------------------------|---|
| Senator Nick Gautreaux | Louisiana Senate |
| Representative Mickey Frith | Louisiana House of Representatives |
| Ms. Karen Foote | Louisiana Department of Wildlife and Fisheries |
| Ms. Karen Gautreaux | Louisiana Department of Environmental Quality |
| Mr. Scott Kirkpatrick | Louisiana Office of the Governor |
| Mr. Kelsey Short | Louisiana Department of Economic Development |
| Mr. Gary Snellgrove, Chairman | Louisiana Department of Natural Resources |
| Dr. Paul Sammarco | Louisiana Universities Marine Consortium (LUMCON) |
| Mr. Harlon Pearce | Louisiana Fish and Seafood |
| Mr. Myron Fischer | Pirate's Cove Marina |
| Mr. Chuck Bedell | Murphy Exploration & Production Company |
| Mr. Bill Bass | Coastal Conservation Association |
| Mr. Tom Newland | The Stanford Group |
| Dr. Wes Harrison | LSU Department of Agricultural Economics and Agribusiness |

APPENDIX C

PLATFORMS FOR MARICULTURE TASK FORCE WORKGROUP VOLUNTEERS

| Name | Affiliation | Workgroup Participants | | |
|----------------------------|------------------------------------|------------------------|---------------|------------|
| | | Economic | Environmental | Regulatory |
| Mr. Chuck Bedell | Murphy E & P Company | | | √ |
| Dr. Mark C. Benfield | LSU Dept. of Ocean. & Coastal Sci. | | √ | |
| Mr. Dailey Berard | | √ | | |
| Mr. David Boulet | The Bayou Companies | √ | | |
| Mr. Charles Broussard | | √ | | |
| Mr. Bill Daughdrill | | | | √ |
| Mr. Albert "Rusty" Gaude' | Louisiana Sea Grant | | √ | |
| Ms. Barbara Goodson | La. Division of Administration | √ | | |
| Dr. Tom Goreau | Global Coral Reef Alliance | | √ | |
| Dr. Robert B. Gramling | University of Louisiana | √ | | |
| Dr. Robert W Harrison, Jr. | LSU Dept. of Ag. Business & Econ. | √ | | |
| Mr. Howard Hershberg | La. Dept. of Natural Resources | √ | | |
| Mr. Phil Hyatt | | √ | | |
| Dr. Jorge Icabalceca | La. Dept. of Wildlife & Fisheries | √ | | |
| Mr. Rick Kasprzak | La. Dept. of Wildlife & Fisheries | | | √ |
| Mr. Scott Kirkpatrick | La. Office of the Governor | √ | √ | √ |
| Mr. Steve Kolian | La. Dept. of Natural Resources | √ | √ | √ |
| Mr. Mike Lyons | La. Mid-Continent O & G Assoc. | | | √ |
| Ms. Vanessa J. Maxwell | LSU Agricultural Center | | | √ |
| Mr. Steve McNemar | | | √ | √ |
| Mr. Link Murray | Marine Bio-Industry | | | √ |
| Mr. Tom Newland | Stanford Group Companies | √ | | |
| Mr. Randall Peterson | | √ | | |
| Mr. Paul Picard | Dixie Fish Farm | √ | | √ |
| Dr. Charles Reith | Tulane University | | √ | |
| Dr. Robert P. Romaine | LSU Agricultural Research Station | | √ | |
| Mr. Manuel Ruiz | La. Dept. of Wildlife & Fisheries | | √ | |
| Dr. Paul Sammarco | LUMCON | | √ | √ |
| Ms. Cynthia Sarthou | Gulf Restoration Network | | √ | √ |
| Ms. Lisa C. Schiavinato | Louisiana Sea Grant Legal Program | | | √ |
| Mr. Harold Schoeffler | Schoeffler Cadillac | | √ | |
| Mr. Kelsey Short | La. Dept. of Economic Development | √ | | |
| Mr. Gary W. Snellgrove | La. Dept. of Natural Resources | | √ | |
| Dr. John Supan | Louisiana Sea Grant | | | √ |
| Mr. Ron Ventola | U.S. Army Corps of Engineers | | | √ |
| Mr. Paul Versowski | Chevron Texaco | √ | | √ |
| Mr. Allen Walker | Xtreem Fishing Charters | | √ | |
| Ms. Heather Warner-Finley | La. Dept. of Wildlife & Fisheries | | √ | |
| Mr. James G. Wilkins | Louisiana Sea Grant Legal Program | | | √ |

APPENDIX D

CRS REPORT FOR CONGRESS ON OPEN OCEAN AQUACULTURE

APPENDIX E

U.S. DEPARTMENT OF COMMERCE REPORT ON MARINE AQUACULTURE

APPENDIX F

PROPOSED FEDERAL RIGS TO REEFS ACT OF 2003

APPENDIX G

TASK FORCE ECONOMIC SUSTAINABILITY ASSESSMENT CONSIDERATIONS

Assessment of the economic sustainability and impact of using decommissioned oil platforms for mariculture operations requires analyses in the following areas:

- *Financial feasibility of selected projects* – Relevant questions include: Which species of fish are best suited for open ocean mariculture in the gulf? Which platforms are technically and economically best suited for such operation (e.g., water depth, water temperature, wave profile, proximity to shore, etc.)? What level of investment is needed? What are the financial returns and risks of such operations?
- *Economic impact on seafood markets* – Relevant questions include: What are the short and long term effects on ex-vessel prices? Will price effects adversely impact commercial fishing?
- *Economic impact on communities and related industries* - Will related industries emerge – e.g., hatcheries, feed suppliers, seafood processing? How many jobs will be created / lost? Who will gain and who will lose?
- *Economic impact on recreational fishing* – How will wild stocks be affected by open ocean mariculture? What are the cost and benefits to recreational / sport fishing? Will effects on wild stocks increase or decrease recreational use? What are the environmental risks and their related costs?

APPENDIX H

GRACE MARICULTURE PROJECT INFORMATION

APPENDIX I

STATE AND FEDERAL AGENCY DISTRIBUTION LIST

Federal Agencies

Army Corps of Engineers
Coast Guard
Department of Energy
Environmental Protection Agency
Fish and Wildlife Service
Food and Drug Administration
Minerals Management Service
National Oceanic and Atmospheric Administration Fisheries

State Agencies

Department of Agriculture and Forestry
Department of Environmental Quality
Department of Health and Hospitals
Department of Natural Resources
Department of Wildlife and Fisheries
Division of Administration
Louisiana Economic Development