

# Joining Forces with Industry Open Ocean Aquaculture 1998

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## Research Summary on Potential Mariculture Species for the Gulf of Mexico

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### Abstract

The Gulf of Mexico is one of the US's most economically productive marine habitats supporting a wide variety of industries including a highly productive fishery. In 1996, Texas landings of marine species were valued at 9.5 million dollars and included a diverse group of fish species ranging from highly pelagic to reef fish. Given the established fishing infrastructure, diverse selection of native species and relatively warm waters, the Gulf of Mexico provides an excellent opportunity for mariculture development. To support a commercial mariculture industry, the target species must be biologically compatible with the culture conditions, have a controllable reproductive cycle, and larval development suitable for the mass culture of juveniles. Additionally, suitable markets must be identifiable that will support the price structure necessary for a commercial operation. Our laboratory has been evaluating and developing native fish species such as Florida pompano, various snappers, groupers, drums, jacks and the cobia as mariculture species. This paper is a brief overview of research at the University of Texas at Austin, Marine Science Institute, Fisheries and Mariculture Laboratory with emphasis on species of potential commercial interest. Examples of controlled maturation, larval development and growth rates will be discussed. Growth rates and culture potential for various gulf species such as Florida pompano, grey snapper, yellowtail snapper, ling and greater amberjack are presented.

### Introduction

Ocean fishing, the largest source of fish production, is producing about 90 million metric tons annually and can no longer sustain the over fishing and pollution pressures man has placed on it (Wiljinsky and Champ, 1993).

At the same time, the world's demand for seafood is rapidly increasing is expected to reach 110 to 120 million tons by the year 2010. In response to this demand aquaculture has developed into the fastest growing production system in the world and is expected to produce 39 million by 2010 (FAO 1996). As the world's second largest importer of fisheries products, the continued expansion of U.S. seafood production diversity agriculture, reduce the nation's balance of trade, relieve fish pressures on native species, diversify the supply of products for sea processing, provide fry and fingerlings for conservation projects, and provide high quality seafood grown under conditions that control the use of antibiotics, steroids and other additives used elsewhere.

The Southeast Region of the United States (Texas to North Carolina Puerto Rico and the U.S. Virgin Islands) supports a diverse fishing processing industry that was valued in 1994 at about 1 billion dollars (NC 1996). Associated with the wild fisheries, are established processing distribution channels for a wide variety of species. With an established infrastructure for seafood processing and suitable coastal and oceanic sites mariculture operations, this area has considerable potential for the continued development of commercial mariculture operations.

Although commercial shrimp and fish farming operations have experienced some difficulties, mariculture operations are slowly becoming established. In Texas, the red drum, *Sciaenops ocellatus*, and pacific white shrimp *Penaeus vannamei* are the primary mariculture species. Each contribute about 3 million pounds to local production. This production is relatively small, yet it has allowed the expansion of infra structural support such as feed mills and hatcheries.

In addition to a small but established mariculture industry, Texas has active marine enhancement program. This program was established, in part, due to declining stocks of red drum in the 1970's. The enhancement program has specialized in the spawning and rearing of sciaenid species such as red drum (*Sciaenops ocellatus*) and spotted seatrout (*Cynoscion nebulosus*). Utilizing spawning technologies developed by Arnold et al (1979, 1988) and extensive pond larval rearing techniques, this program has been extremely successful. It has developed into an active marine enhancement program that includes three hatcheries capable of producing 30 million red drum and 5 million seatrout fingerlings annually.

These examples of mariculture and stock enhancement operations clearly demonstrate that commercial operations and large scale hatcheries are viable entities in the United States. In addition to the well established production technology for the red drum there are a wide variety of native species