Potential Economic Impact of Offshore Aquaculture in the Gulf of Mexico

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Objectives

- Develop a hypothetical commercial offshore aquaculture production system (COAPS) in the Gulf of Mexico (GOM).
- Estimate the potential economic impact of initial establishment and operation of COAPS in the GOM.
- Determine the economic sectors with the strongest linkages to COAPS.

Data Sources for COAPS

- Offshore aquaculture production system
  - Offshore Aquaculture Consortium (OAC)
- Offshore cage design & operation
  - Ocean Spar and OAC
- Gulf of Mexico and South Atlantic ex-vessel prices and U.S. Imports
  - National Marine Fisheries Service (NMFS)

Offshore Aquaculture Production System

- Aquaculture Service Vehicle (ASV)
- 3,000-m3 Ocean Spar Sea Station (OSSS) cages
- Moorings, feed distribution system and net cleaners
- Service boats

Land-based Support Facilities

- 2-ha base camp
- Office building and trailers
- Trucks and service vehicles
- Fish transport vehicle

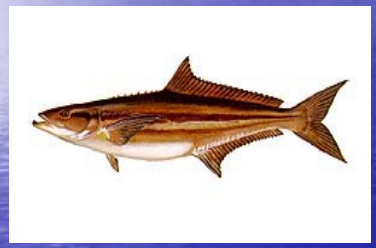
Initial Fixed Investment (12-cages or 36,000 m3)

Item	*Total Cost (US$)*	*US$/m3*
Onshore support facilities	0.33	9
Offshore facilities	3.52	98
Total investment	3.85	107

CANDIDATE FISH SPECIES

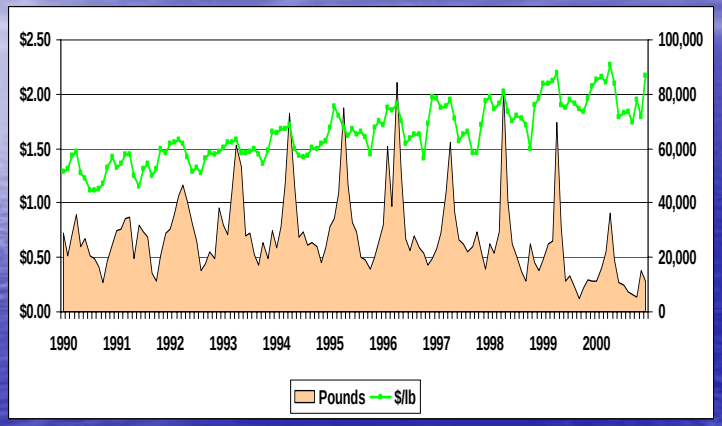
- Culture characteristics
  - Spawning and hatching
  - Growth potential
  - State and federal regulations
- Commercial Harvest
  - Landings
  - Ex-vessel Prices
  - South Atlantic
  - Gulf of Mexico

Cobia or Lemon Fish or Ling
Rachycentron canadum



- **Successfully cultured in ponds and cages in Taiwan and Puerto Rico.**
- **Can be grown to at least 5 kg in 12 months.**
- **Successfully spawned in USA.**
- **Commercial harvesting is subject to state and federal regulations**

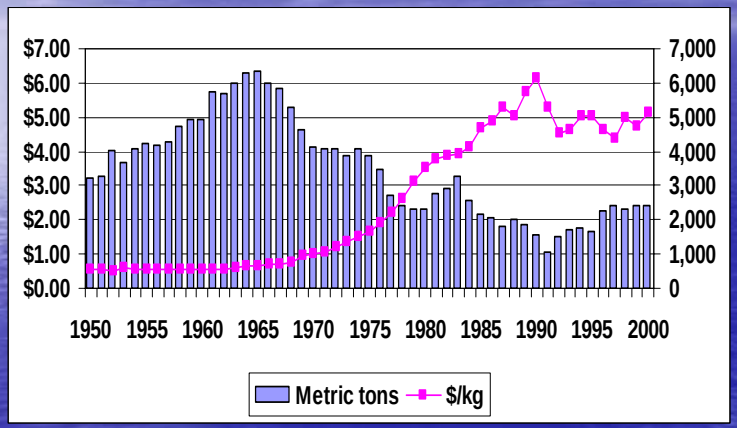
Monthly U.S. Commercial Cobia Landings



Red snapper *Lutjanus campechanus*

- Experimental results in Alabama showed growth rate of 1.23 g/day.
- Commercial harvesting is subject to state and federal regulations

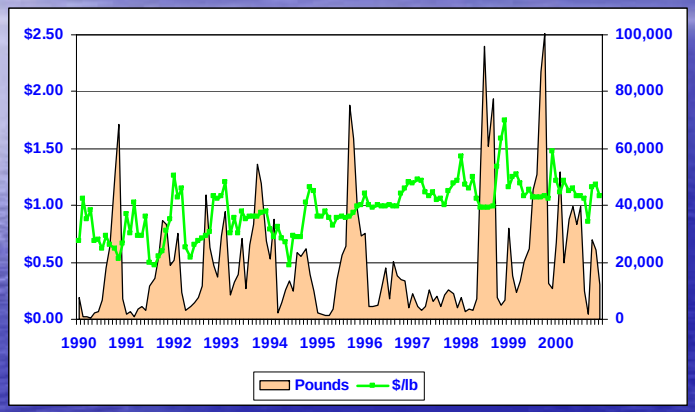
Annual U.S. Commercial Red Snapper Landings



Red drum or Redfish *Sciaenops ocellatus*

- Successfully cultured in ponds and offshore cages in the Gulf of Mexico.
- Can reach 1 kg in 12 months
- Commercial harvesting is subject to state regulations
- Illegal to harvest or possess in federal waters

Monthly U.S. Commercial Red Drum Landings



12- Cage COAPS Enhanced Market & Improved Growth Model

Item	*Unit*	*COBIA12*	*SNAP12*	*DRUM12*
Stocking density	**Fish/m3**	**6**	**67**	**33**
Growth rate	**G/month**	**729**	**46**	**100**
Ex-vessel price	**$/kg**	**5.25**	**5.50**	**4.75**
Harvest size	**Kg/fish**	**6.57**	**0.56**	**1.21**
Fish production	**1000 mt/yr**	**1.08**	**1.08**	**1.08**
Net returns	**$M/yr**	**1.89**	**0.22**	**0.43**
NPV	**$M**	**7.36**	**<0**	**0.75**
IRR	**%**	**52**	**8**	**15**
Investment decision		**Feasible**	**Infeasible**	**Infeasible**

IMPLAN Sectors Used in Modeling

- IMPLAN Professional 2.0 Software
- 2000 GOM states IMPLAN data files
  - FL, AL, MS, LA, TX
- COAPS
  - Miscellaneous Livestock Sector (9)
  - SIC Codes 0271 & 0272
- Commercial Seafood Processing
  - Prepared Fresh or Frozen Fish or Seafood Sector (98)
  - SIC Code 2092
- Commercial Harvesting
  - Sector 25
  - SIC Code 0910

Impact of Initial Investment in a Single COAPS

- Economic output - $6.84 M
- Employment – 197 jobs
- Labor income - $2.17 M
- Indirect business taxes - $0.21M
- Federal income taxes - $0.23 M

Impact of Operating a Single COAPS

- Economic output - $9.1 to 10.2 M
- Employment – 262-289 jobs
- Labor income - $2.9 to 3.2 M
- Indirect business taxes $0.28 to 0.31 M
- Federal income taxes - $0.34 M

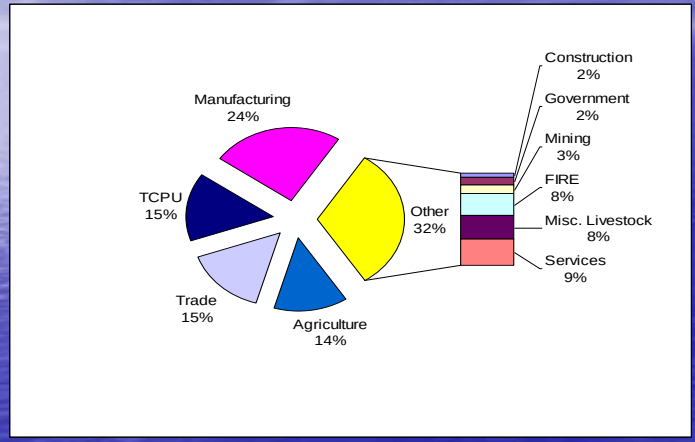
Impact of Current Commercial Harvesting of Target Species

- Economic output - $20.1 M
- Employment – 628 jobs
- Labor income - $10.3 M
- Indirect business taxes - $0.86 M

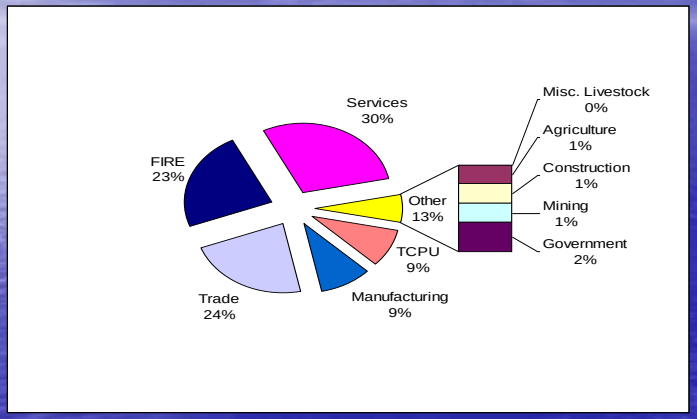
Impact of Current Commercial Processing of Foodfish Species

- Economic output - $80.8 M
- Employment – 769 jobs
- Labor income - $17.6 M
- Indirect business taxes - $1.3 M

Distribution of Indirect Effects of a Single COAPS



Distribution of Induced Effects of a Single COAPS



Implications and Limitations

- Economic impact of COAPS can be estimated by using existing IMPLAN sectors.
- A single 12-cage COAPS can create annual economic output ranging from $9.1 to 10.2 M.
- Current commercial harvesting of the three candidate species created annual economic output of $20.1 M.
- Primary processing of foodfish species created annual economic output of $80.8 M.

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- Gulf of Mexico Offshore Aquaculture Consortium (OAC) - http://www.masgc.org/oac/