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EXECUTIVE SUMMARY OF THE 1989 TEXAS CLOSURE

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Introduction

The Southeast Fisheries Center (SEFC) provides detailed reports that evaluate the Texas closure management option in January to the Gulf of Mexico Fishery Management Council. This year's reports, presented in January 1990 on the 1989 closure, are the ninth time that the Southeast Fisheries Center has evaluated the Texas closure management measure. This summary report provides findings from two detailed reports.

Background

The Gulf of Mexico Shrimp Fishery Management Plan (FMP), prepared by the Gulf of Mexico Fishery Management Council in 1981, regulates fishing for brown shrimp in the Exclusive Economic Zone (EEZ) off the coast of Texas. This regulation prohibited brown shrimp fishing in the total EEZ (200 mile closure) during the periods: May 22-July 15, 1981; May 26-July 14, 1982; May 27-July 15, 1983; May 16-July 6, 1984; and May 20-July 8, 1985. In 1986, 1987 and 1988 only the portion of the EEZ from 9 to 15 miles was closed to fishing. In 1986 it was closed from 10 May to July 2, 1986, while in both 1987 and 1988 it was closed from June 1 to July 15. This year the 200 mile closure again went into effect and the entire EEZ was closed to shrimping activities from June 1-July 15, 1989. State of Texas regulations, implemented in 1960, prohibited shrimp fishing in the territorial sea off Texas during these same periods, except for the white shrimp fishery inside the 4 fm line.

The management objectives of the Texas closure regulation (as specified in the FMP) are to increase the yield of brown shrimp and eliminate the waste of the resource caused by discarding undersized shrimp caught during a period in their life cycle when they are growing rapidly. The objective of the 1960-1980 Texas territorial sea closure was to insure that a substantial portion ($\geq$50%) of the shrimp in Gulf waters had reached 65 tails/lb or 112 mm in length by season's opening. Thus, the temporary closure of the offshore fishery form mid-May to mid-July each year provides larger shrimp to the fishery when fishing is again permitted in mid-July. The monetary benefits of this management regulation result from catching more valuable shrimp.

Methods

The research approach in 1989 was similar to that used in most 200 mile closure years. Simulation analysis compared this years complete 200 nautical mile closure with a closure of the Texas territorial sea only (entire EEZ opened to shrimping). The scientific analyses were based on resource survey and fishery statistical data.

Port agents collected statistics on the catch, effort, and fishing location of shrimp vessels operating in the Gulf of

Mexico. These data provided information on the species, size and location of shrimp, as well as information on the catch rates and fishing tactics of the vessels in the fleet. The data were used as input into cohort-type simulation models to estimate recruitment, fishing mortality, and the effects of the closure on biological yield, ex-vessel prices, and value. Price data, collected by the port agents, were incorporated into the models to evaluate the economic impact of the closure.

Conclusions

1. Recruitment

Recruitment of brown shrimp to Texas offshore waters in 1989 appeared to be slightly lower than in 1988, but significantly lower than in 1981. We predicted the 1989 annual offshore harvest to be 23.1 million pounds, which is below the average (long-term) production of 26.8 million pounds. This prediction was based on data collected from the Galveston Bay bait shrimp fishery during May and early June.

Louisiana Department of Wildlife and Fisheries indicated that brown shrimp recruitment west of the Mississippi River would be above average. The NMFS forecasted an annual harvest of 43.7 million pounds for the combined inshore and offshore fishery in areas 13-17, which is above the historical average of 27.8 million pounds.

2. Commercial Fishing Results

In 1989, the total Louisiana May-August catch was 31.0 million pounds compared to 23.4 million pounds in Texas. Recruitment levels were different between the two areas. The Texas offshore brown shrimp catch in July and August 1989 was 16.3 million pounds compared to 12.5 in 1988, 14.2 in 1987, 10.7 in 1986, 14.0 in 1985, 15.3 in 1984, 9.8 million pounds in 1983, 13 million pounds in 1982, and 25 million pounds in 1981.

Considerable discarding of small shrimp was encountered in 1985 with an estimated 1.1 million pounds being discarded in the first six weeks of the open season. In 1986 only 23,000 pounds of shrimp were discarded, in 1987 approximately 103,000 pounds were discarded, while in 1988 little discarding was also reported. Discarding information for 1989 will not be available because of the poor interview levels experienced this year. Pre-closure year studies have shown that on the average 33% of the total number of shrimp caught between May-August are discarded off the Texas coast. This high rate of discarding was not evident during the 1986-1988 period. The reason for this may be because there has been a demand for small shrimp and thus better than average prices are being paid for small shrimp.

Fishing effort was moderately high off both Louisiana and Texas in 1989 (Table 1). The trend of increasing total Gulf

effort has been documented for the past several years and does not appear to be an effect of closure regulations.

The average catch per unit of effort (CPUE) off Texas for July-August 1989 period was 1028 pounds/day compared to 684 pounds per day in 1988, 789 pounds/day in 1987, 856 pounds/day in 1986, 918 pounds/day in 1985, 819 pounds/day in 1984, 962 pounds/day in 1983, 922 pounds/day in 1982, and 1,895 pounds/day in 1981. Off Louisiana the average CPUE for the July-August 1989 period was 652 pounds/day, whereas the July-August 1988 period average CPUE was 538 pounds/day. Thus, during the July-August 1988 and 1989 periods, the CPUE off Texas was at least 1.5-2.0 times greater than off Louisiana (Table 1). This is similar to most other closure years.

The July size composition of the 1989 offshore brown shrimp catch in Texas waters was similar to other closure years with the average size of about 42 count. In 1987, however, the average count size was 49.

The Louisiana inshore brown shrimp fishery produced 11.3 million pounds in 1989 compared with 14.0 million pounds in 1988. The inshore catch had an average tail size of 119 per pound in May and 102 per pound in June.

The Texas inshore fisheries accounted for approximately 6.1 million pounds of brown shrimp in 1989, 6.9 million pounds in 1988, 7.6 million pound in 1987, 5.1 million pounds in 1986, 5.4 million pounds in 1985, and 7.1 million pounds in 1984. The inshore catch in 1989 was predominated also by shrimp of 116 or greater, with the average size count of 134 in both May and June. Overall, small shrimp were prevalent throughout the bays in May and June, resulting in small shrimp available to the Texas offshore fishery in June, but larger count shrimp were available in July and August.

3. Vessel Activity

The ratio of June/August effort during the 1986-1988 period was above closure (1981-1985) levels, indicating that fishing effort that had not occurred in past years because of the 200 mile closure, re-entered the June offshore fishery during 15 mile closure years. This June/August ratio was again low in 1989 with the 200 mile closure in effect. The fraction of Gulf-wide fishing effort off Texas in August 1989 was at pre-closure levels, suggesting that no additional shift in effort to or away from Texas occurred this year. For the first time in four years, July fell behind August as the month of maximum offshore effort.

Home port information indicated that during the June 1 through August 31, 1989 period Louisiana vessel predominantly landed in Louisiana and very few Texas vessels landed in Louisiana. Likewise, Texas vessels predominantly landed the majority of shrimp landed in Texas. Louisiana vessels rarely

landed in Texas. Over 90% of the offshore landings in Louisiana were caught by Louisiana vessels and between 80-90% of the Texas landings were caught by Texas vessels or boats. Yet, during June of this year, most of the shrimp landed in Texas were taken from Louisiana waters.

4. Impacts of the 1988 and 1989 EEZ Closure on CPUE, Yield and Value

Potential increases in harvests of large shrimp were exchanged for access to offshore waters during May and June in 1988 but not in 1989. May-June catches during the 200 mile closure years (1981-1985) have averaged 0.66 million pounds, while the May-June catches during the 15 mile closure years (1986-1988) have averaged 3.1 million pounds. The CPUE ratio (Texas/elsewhere) in July 1988 fell to levels comparable with pre-closure years, indicating no appreciable build-up in biomass due to the 15 mile EEZ closure. The CPUE ratio (Texas/elsewhere) in July 1989 was comparable to other 200 mile years and showed that a biomass build-up had occurred off the Texas coast.

In biological year 1988, a complete closure would have increased Gulf-wide by 3.6 (4%) million pounds. Because of the gains experienced in the medium size count groups, this would have resulted in a 17.4 (6.2%) million dollar gain for the fishery (Table 2). In biological year 1989, the EEZ closure increased Gulf-wide yield during the May-August period, with a gain of 0.4 million pounds (<1%). This would have resulted in an increase in dollars to the fishery during the May-August period of around 4.2 million dollars (1.6%). Projections for the May 1989-April 1990 period show a gain of 0.80 million pounds, with the closure in effect in the EEZ off Texas.

5. Yield per Recruit Results

The potential gain in yield from shrimp protected by the partial closure of the EEZ were estimated to have been 8-29% in 1988 and 3-23% in 1989. These estimates were based on SEAMAP research vessel sampling and yield per recruit type analysis.

6. Finfish By-Catch Estimates

Finfish by-catch during shrimp trawling operations off Texas during a 200 mile and a 15 mile closure were calculated using both historical and current estimates of finfish CPUE. It appears that finfish catches during a 15 mile closure are greater than during a 200 mile closure. Based on historical CPUE, catches during a 15 mile closure would be almost 4 times greater than during a 200 mile closure. Using current catch rates, finfish by-catch during a 15 mile closure would about 2 times greater than catches during a 200 mile closure.

Estimated by-catch of finfish by species during a 200 mile and a 15 mile closures was also calculated using historical and

current catch rates. It appears that nearshore species catches would be generally 2 time greater during a 15 mile closure than during a 200 mile closure. Offshore species catches would be from 3.5 to 10.6 times greater during a 15 mile closure than during 200 mile closure.

7. General Conclusions

Conclusions about the 1989 seasonal closure are mixed. It appears that a gain in both pounds and dollars occurred in the Gulf-wide brown shrimp fishery with the EEZ closed to 200 nautical miles. However, vessel mobility was greater than in 15 mile closure years. Vessels tended to fish off their own state more in 1989 after the closure, but during the closure Texas vessel fished to a large extent off the Louisiana coast. Enforcement of the 200 nautical mile closure was not a major problem. Finfish by-catch off Texas would probably be reduced with a 200 mile closure in effect.

TEXAS CLOSURE REPORTS

Titles of reports on the Texas closure submitted to the Gulf Council in January 1990.

Biological review of the 1989 Texas closure for the shrimp fishery off Texas and Louisiana. James M. Nance, Edward F. Klima, Elizabeth S. Denton, K. Neal Baxter and Frank J. Patella.

Potential changes in yield from the closed portion of the Texas EEZ, based on research vessel sampling, 1988 and 1989, Scott Nichols.

Table 1. Commercial catch statistics for the Gulf of Mexico brown shrimp fishery.

July-August brown shrimp landings (millions of pounds), fishing effort (1,000 days) and CPUE (pounds per day).

	1981	1982	1983	1984	1985	1986	1987	1988	1989
Texas Offshore									
Catch	25.0	13.0	9.8	15.3	14.0	10.7	14.2	12.5	16.3
Effort	14.8	15.7	10.3	18.6	15.2	12.5	18.1	18.2	15.9
CPUE	1,895	922	962	819	918	856	789	684	1,028
Louisiana Offshore									
Catch	10.5	5.1	4.9	6.6	6.1	9.6	9.3	8.3	7.5
Effort	11.9	9.8	11.2	11.2	9.7	11.8	15.8	15.4	11.5
CPUE	863	524	439	587	625	813	589	538	652

Table 2. Summary of analytical results of the Texas closure shrimp fishery management measure, 1982-1988. Values shown are the statistics used to measure the effects of the closure for the Territorial sea and EEZ combined.

	YEAR							
Statistics	1982	1983	1984	1985	1986	1987	1988	1989
1. CPUE ratio Texas:elsewhere[1/]								
July	2.06	2.34	1.86	1.74	1.24	1.38	1.44	2.35
August	1.35	1.40	1.34	0.96	1.10	1.26	1.15	1.42
2. Change in Gulf-wide Yield[2/]								
(May-Aug)	+0.7(1%)	-0.5(1%)	-0.6(1%)	-2.5(4%)	1.3(2%)	+0.8(1.2%)	-1.8(2.8%)	+0.4(<1%)
(May-Apr)	+1.4(2%)	+0.4(1%)	+1.4(2%)	-0.3(4%)	+1.1(1.2%)	+0.1(<1%)	+3.6(4%)	+0.8(1.0%)
3. Change in Gulf-wide Value[2/]								
(May-Aug)	+5.3(3%)	+2.1(2%)	+8.5(6%)	-5.1(-1.2%)	-0.14(<1%)	+10.1(3.5%)	-0.18(<1%)	+4.2(1.6%)
(May-Apr)	+6.0(3%)	+6.7(3%)	+18.7(9%)	+6.1(1.4%)	+9.8(3.5%)	+10.5(3.9%)	+17.4(6.2%)	[3/]

[1/] Long-term average CPUE ratios (Texas:elsewhere) for 1960-80 are: July, 1.27; August, 1.06.

[2/] All values (yield in millions of pounds and value in millions of dollars) are if a 200 nautical mile closure was in effect.

[3/] Data required for estimate not yet available.