

AN ECONOMIC ASSESSMENT OF CHANGES IN THE SOUTHEAST FINFISH PROCESSING INDUSTRY

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INTRODUCTION

The Southeast Region of the United States¹ is recognized for its abundance of fishery resources and its harvests contribute significantly to the U.S. domestic supply of edible seafood products. While it may best be known for its large shellfish harvests—especially shrimp, oysters, and crabs—the region is also a major producer of edible finfish products.

A distinguishing element of the Southeast edible finfish industry relates to the large number of species produced. Several of these species including red snapper, grouper, king and Spanish mackerel, and red drum were the subject of declining catches and/or harvesting restrictions in recent years. Imports of many of these same species through Southeastern ports, however, appear to have increased during the same period (Adams and Lawlor). This increase may be in response to a growing deficit between domestic demand and domestic supply of products harvested in the Southeast.

Southeast U.S. finfish processors use domestic and, to an unknown extent, imported sources of raw material, i.e. unprocessed or semi-processed finfish, in processing activities². The overall goal of this paper is to provide an economic overview of the Southeast finfish processing industry based on available secondary data. Specific objectives and methodology used in the paper are presented below.

OBJECTIVES AND METHODS

Five specific objectives will be accomplished with this paper. They are as follows:

- (1) To document the number of Southeast finfish processing plants and changes therein, especially in recent years
- (2) To document changes in the quantity and value of Southeast finfish processing activities in total and on a per plant basis
- (3) To document stability in the Southeast finfish processing industry and changes therein
- (4) To document industry concentration among Southeast finfish processors
- (5) To relate changes in the structure of the Southeast finfish processing sector, as outlined in the previous four objectives, with changes in Southeast finfish harvests and imports.

The National Marine Fisheries Service (NMFS), Fisheries Statistics Division, collects and maintains the most complete database on the Southeastern finfish processing industry. This database, which was used to accomplish the aforementioned objectives, includes detailed historical activities on each processing plant (eg. quantity, value, and product form of each species processed) and is collected during end-of-the-year voluntary surveys. The period of analysis is for the years 1973-88, inclusive.

A wide variety of products are produced by finfish processors in the Southeastern United States. To facilitate comparison among species and product forms, all reported products in this study have been converted to round weight based on conversion factors developed by NMFS. Converting the pounds of raw king mackerel fillets into round pounds, for example, was carried out by multiplying the pounds of fillets by the NMFS conversion factor (i.e. round weight = pounds of raw fillet * 2.86). Similar calculations were made for each species and product form.

For purposes of analysis, non-edible processed finfish products and processed catfish have been excluded from this analysis. The list of non-edible products produced from finfish would include such items as fish meals, oils, pet foods, animal feeds, canned croaker, and items for medicinal purposes. Catfish were excluded from the analysis because this study is only concerned with the processing of wild finfish stocks and because the emphasis of the study is on marine fish species. It is noted, however, that some species included in the analysis, such as salmon, may not be harvested in the Southeast but are brought to the region for processing.

SOUTHEAST FINFISH HARVESTS AND IMPORTS

Domestic Harvests

Annual Southeast finfish harvests, excluding menhaden, remained relatively stable during the 1973-88 period when evaluated on a four-year basis (Table 1). The high four-year annual average of 224.2 million pounds during 1985-88, for example, exceeded the low four-year annual average of 195.8 million pounds during 1977-80 by less than 15%.

Though the annual Southeast edible finfish harvests³ remained relatively stable during 1973-88 when expressed on the basis of poundage, the value of these harvests adjusted for inflation to 1988 dollars, experienced a significant increase (Table 1). For example, the deflated value of edible finfish harvests during 1985-88, averaging \$157.8 million annually, exceeded comparable statistics for the 1973-76 period by 50%. Most of the increase in deflated value, as indicated in Table 1, was the result of an increase in the deflated price per pound for the harvest, rather than any long-run increase in the harvest. This increased real price may be the result of several factors including but not limited to (1) increased demand for Southeast edible finfish relative to supply, (2) harvests of more desired, higher priced, finfish species, (3) some combination of the two.

Imports

As noted, imported raw materials, ie, unprocessed or semi- processed finfish products, are also used to an unknown extent by the Southeast U.S. finfish processing industry. While detailed import statistics are not maintained for most finfish species comparable to those harvested in the Southeast, such as grouper and king mackerel, recent analysis by Adams and Lawlor (1989) helps to identify some changes in the Southeast finfish import situation. Overall, the authors found that imports of key species⁴ into Southeastern ports of entry increased from 17.4 million pounds (product weight) in 1983 to 70.4 million in 1987 while the number of imported species expanded from 32 to 60. The imports of whole fish, that product form most likely to be used in Southeast U.S. finfish processing activities, grew from less than 20 million pounds to more than 50 million pounds

during the five-year period ending in 1987. Among products of particular interest to Southeast finfish processors, imports of whole snapper increased from about 4 million pounds in 1983 to more than 12 million pounds in 1987, imports of whole grouper increased from less than one million pounds to almost six million pounds, and whole king mackerel imports expanded from just over six-hundred thousand pounds to 1.8 million pounds.

Table 1. Selected Statistics Pertaining to Southeast U.S. Finfish Harvests (Excluding Menhaden), 1973-88, Four Year Averages.

TIME PERIOD	POUNDS HARVESTED	DEFLATED VALUE	DEFLATED PRICE
	(Mill. lbs.)	(\$ Mill.)	(\$/lb.)
1973-76 avg.	217.6	105.5	0.485
1977-80 avg.	195.8	116.9	0.597
1981-84 avg.	217.1	132.3	0.609
1985-88 avg.	224.2	157.8	0.704

Source: Unpublished data provided by National Marine Fisheries Service.

FINFISH PROCESSING RESULTS

Number of Processing Plants and Industry Size

As indicated by the information contained in Table 2, an average of 71 finfish processing plants were active on an annual basis in the Southeast U.S. during 1973-76. By 1985-88, the number had risen almost 75%. While an increasing number of plants was evident during each four-year period of analysis, it was especially pronounced through the 1981-84 period. While the average of 123 plants during 1985-88 represented a net increase of 11 from the previous period, this increase was only about one-half that observed in other periods.

Total edible finfish processing activities in the Southeast also increased during 1973-88 when evaluated on the basis of either pounds or value. For example, the total number of pounds processed (round weight) more than doubled during the period of analysis, from 45.6 million annually during 1973-76 to 99.6 million annually during 1985-88. Similarly, the average annual deflated value of the processed product increased about 125%, from \$46.1 million to \$103.9 million. The information suggests that the largest increase in processing activities occurred between the 1977-80 and 1981-84 periods, when the processed pounds increased by more than 70% and the related value (adjusted for inflation) increased by more than 40%. This time frame coincided with the greatest increase in the number of plants. While processing activities continued to expand beyond the 1981-84 period, they did so at a reduced rate.

Table 2. Number of Southeast Edible Finfish Processing Plants and Related Processing Activities, 1973-88 Four Year Averages.

TIME PERIOD	PROCESSED LBS. ^a		DEFLATED VALUE ^b			DEFLATED PRICE ^c
	NO. OF PLANTS	Total	Per Plant	Total	Per Plant	
		#	-- 1,000s --	--	-- \$1,000s --	
1973-76 avg.	71	45,625	640	46,081	647	1.01
1977-80 avg.	90	49,601	550	58,094	644	1.17
1981-84 avg.	112	84,085	749	82,049	731	0.98
1985-88 avg.	123	99,606	811	103,893	846	1.04

^a Processed pounds have been converted to round weight using NMFS conversion factors.

^b Deflated value is based on the 1988 Consumer Price Index (i.e., 1988 = 100).

^c Derived by dividing the deflated value by processed pounds.

The increased finfish processing activities in the Southeast during the period of analysis was the result of two factors. First, as noted, there was an expansion in the number of plants engaged in finfish processing activities. Second, processing activities per plant grew during 1973-88. Pounds processed per plant, for example, increased from an average of 640 thousand annually during 1973-76 to 811 thousand annually during 1985-88 (Table 2). The deflated value of these processed products, on a per plant basis, increased from \$647 thousand annually to \$846 thousand annually.

Some finfish processing plants process only finfish products. Others process both finfish and shellfish products. As indicated by the information contained in Tables 2 and 3, about one-third (23 of 71) of the reported Southeastern finfish processing plants during the 1973-76 period produced only finfish products. The other two-thirds (48 of 71 plants) produced both finfish and shellfish products. By 1985-88, however, almost 60% of the reported finfish processing plants processed only finfish products (71 of 123 plants). In general, most of the growth in the number of Southeast finfish processing plants during 1973-88 (71 to 123) appears to be among plants specializing only in the processing of finfish products. Plants of this kind increased from 23 to 71. By comparison, plants that processed both finfish and shellfish species equalled 48 during 1973-76, increased somewhat during the next two four-year periods, and then fell sharply to an average of 52 during 1985-88.

As noted, total Southeast finfish processing activities expanded from 45.6 million pounds to 99.6 million pounds, or a total of 54.0 million pounds, during the period of analysis (see Table 2). Plants processing only finfish products represented about one-half of this total increase while plants processing both finfish and shellfish products contributed the other one-half. On a per plant basis, however, plants producing only finfish products showed no growth in pounds processed. Plants processing both finfish and shellfish products showed significant growth in the pounds of finfish processed (an average of 662

thousand pounds during 1973-76 compared to 1.16 million pounds during 1985-88). Overall, plants that processed only finfish received a higher deflated price per pound for their products than plants that processed both finfish and shellfish products.

Table 3. Selected Statistics Related to Southeast Edible Finfish Processing Activities By Type of Establishment^a, 1973-88 Four Year Averages.

TIME PERIOD	NO. OF PLANTS	PROCESSED LBS. ^b		DEFLATED VALUE ^c	
		Total	Per Plant	Per Plant	DEFLATED PRICE
	#	--- 1,000s ---		-- \$1,000s ---	\$/lb.
<u>Finfish products only</u>					
1973-76 avg.	48	33,015	688	31,772	662
1977-80 avg.	63	34,985	555	38,241	607
1981-84 avg.	61	56,893	933	52,157	855
1985-88 avg.	52	60,320	1160	56,700	1090
<u>Finfish and shellfish products</u>					
1973-76 avg.	23	12,610	542	14,309	615
1977-80 avg.	27	14,616	536	19,853	728
1981-84 avg.	51	27,192	533	29,892	586
1985-88 avg.	71	39,286	555	47,193	667

^aFor purposes of these tables Southeast finfish processing establishments have been categorized as to whether they process only finfish products or finfish and shellfish products.

^bProcessed pounds have been converted to round weight using NMFS conversion factors. This poundage reflects only finfish.

^cDeflated value is based on the 1988 Consumer Price Index (i.e., 1988=100).

Stability

For purposes of this paper stability in the Southeast finfish processing industry was analyzed in relation to entry and exit among its plants⁵. A relatively large degree of entry and exit in relation to the total number of plants would suggest that barriers to entry are minimal. It may also indicate that plants enter and exit in relation to raw material supplies. In years when domestic finfish harvests are good, for example, there may be a large increase in finfish processing plants. In years when domestic finfish harvests are poor, there may be a large decrease in the number of finfish processing plants. One would expect, however, that increased imports could mitigate industry turnover via a more stable supply source.

As indicated by the information contained in Table 4, entry into the Southeast finfish processing industry was common during the period of analysis. During 1974-76, for example, an average of 12 plants entered into finfish processing activities on an annual basis. The number of entering plants continued to expand throughout the study period, equalling 30.8 annually during 1985-88. Overall, the entry rate among plants in the Southeast finfish processing industry averaged about 18% per year during the 1974-76 period (12.0 divided by 68 total plants) and increased to close to 25% per year in each of the three remaining four-year periods.

While a large number of plants initiated finfish processing activities on an annual basis during 1974-88, many also ceased operations. For example, while 12.0 plants initiated finfish processing activities on an annual basis during the 1974-76 period, 15.3 plants ceased these activities. As with the entry rate, the exit rate among Southeast finfish processing plants generally averaged close to 25% annually, with two exceptions. The most recent of these exceptions occurred during the most recent four-year period. During this period the exit rate fell to 15% annually and the total number of plants increased from 99 in 1984 to 149 in 1988.

A comparison of the information contained in Tables 2 and 4 indicates that entering plants had a lower level of finfish processing activities than the more established plants. During 1977-80, for example, entering plants processed 153 thousand pounds of processed product annually compared to 550 thousand pounds among the more established plants. During the most recent four-year period, entering plants processed 40% that of the established plants in terms of pounds, on average, and almost 50% by value.

Processing activities among plants that ceased finfish processing activities also tended to be relatively small, on average, when compared to their more established counterparts. During the most recent four-year period for example, exiting plants averaged 236 thousand pounds of processed product annually compared to 846 thousand pounds for the industry in total.

Concentration

Concentration in the Southeastern finfish processing industry was analyzed on the basis of relative market share of the largest five, ten, and twenty plants. As indicated by the information contained in Table 5, the five largest processing plants consistently accounted for more than 50% of the finfish processing activities throughout the period of analysis, when expressed on the basis of poundage. The concentration among these largest plants, expressed on the basis of value, was somewhat less, however, indicating that plants processing the most product were not necessarily processing the products with the greatest value. The ten largest finfish processing plants represented about 65% to 76% of processing activities depending upon the period of analysis, with the lower concentration occurring during the most recent four-year period. While the largest twenty plants accounted for 90% of finfish production activities during 1973-76, their share had fallen to less than 80% by 1985-88.

Analysis of the data also indicated that four of the ten largest Southeastern finfish plants had been in business since at least 1973, the first year that complete data on all plants was available. Finfish processing activities among these four plants averaged about 6.8 million pounds (round weight) each in 1988, value of \$6.26 million. Another three of the ten largest plants had been in operation for at least eight years. Processing activities among each of these three companies averaged close to 4.7 million pounds in 1988, valued at \$3.7 million. The remaining three companies had been in operations less than eight years and averaged 2.6 million pounds of finfish processing activities on a per plant basis.

Table 4. Average Annual Entry and Exit Among Southeast Finfish Processing Plants and Related Processing Activities, 1973-88.

TIME PERIOD	TOTAL PLANTS	NO. OF PLANTS		PER PLANT PROCESSED POUNDS		PER PLANT DEFLATED VALUE	
		Entering	Exiting	Entering	Exiting	Entering	Exiting
1973	81						
1974-76	68	12.0	15.3	183	218	175	187
1976	71						
1977-80	90	21.8	13.3	153	131	213	106
1980	105						
1981-84	112	25.0	26.5	240	294	212	219
1984	99						
1985-88	123	30.8	18.3	323	236	407	254
1988	149						

Processed pounds have been converted to round weight using NMFS conversion factors. Deflated value is based on the 1988 Consumer Price Index (i.e., 1988=100).

Table 5. Estimated Concentration in the Southeast Edible Finfish Processing^a Industry, 1973-88.

TIME PERIOD	N = 5		N = 10		N = 20	
	Lbs.	Value	Lbs.	Value	Lbs.	Value
	%		%		%	
1973-76	59.5	22.7	75.8	71.5	90.0	88.3
1977-80	51.6	36.8	69.3	61.4	84.7	82.4
1981-84	58.	36.4	74.7	64.2	86.4	81.8
1985-88	50.6	37.2	64.8	55.	78.0	71.3

^a Plants were ranked on the basis of pounds produced (round weight) and values are related to the same group of plants. A ranking by value would likely lead to different results.

DISCUSSION

The final objective of this paper was to relate changes in the structure of the Southeast finfish processing industry with changes in Southeast finfish harvest and imports. Several points in relation to this objective are listed below.

- (1) There was significant growth in the Southeast finfish processing industry, measured in terms of pounds processed, despite relatively stable domestic harvests. This indicates processors were (a) increasing the share of domestic finfish harvests that went into finfish processing activities, (b) increasing the use of imports, or (c) some combination of the two.
- (2) While the harvest price of edible Southeast finfish increased significantly during the period of analysis the processed finfish price has shown no increasing trend. This may be due to (a) increased use of lower priced, domestically harvested species in processing activities, (b) increased use of lower priced imports, (c) a decline in the processor's marketing margin, or (d) some combination of the above factors.
- (3) The exit rate among Southeast finfish processors was relatively low during the 1984-88 period when compared to other periods. This decline may be the result of a more consistent supply brought forth by increased imports since the early 1980s. Additional years of data, however, are needed to further assess this hypothesis.
- (4) A significant decline in industry concentration was evident during the most recent four year period of analysis. This may be due to the increase in imports which may have allowed smaller plants to expand their processing activities through new sources of supply. Also, the new supply source may help explain the increase in the number of finfish processing plants which, *ceteris paribus*, will result in a reduction in industry concentration.

ENDNOTES

1. Defined by the National Marine Fisheries Services as the coastal states of North Carolina through Texas
2. Finfish processing in the Southeast U.S. would include, but is not limited to, processing activities such as filleting, dressing, gutting, smoking, breading, salting and canning. The processing of finfish into frozen and canned specialty products is also an important sector of the industry.
3. It is considered for purposes of analysis that total Southeast finfish harvest minus the menhaden harvest equals edible finfish production. In reality this figure likely exceeds actual edible finfish.
4. See Adams and Lawlor for a list of key species. Shellfish species, excluding shrimp, are included in the list.
5. Turnover, or entry and exit, can result from three factors. First, existing plants can add or delete finfish products from their processing lines. Second, plants can change ownership which results in both an exit and entrance. Finally, plants that cease operations are recognized as an exit and new processing facilities are recognized as an entrance.

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