

TRENDS IN GULF OF MEXICO SHRIMP TRAWLING FLEET

By Rolf Juhl*

The design of Gulf of Mexico shrimp trawlers has kept step with the expanding shrimp fishery. From small, shallow-draft, single-rig vessels, operating in a predominantly inshore fishery, design changes have produced larger and more versatile double-rigged vessels that can fish offshore in depths of 50 fathoms and greater. The present-day shrimp vessel design evolved from the Florida single-rig trawler, which had the house forward and working deck aft. The double-rig trawling method was initiated during 1955 and soon gained acceptance throughout the Gulf of Mexico.

Shrimp trawling in the Gulf has developed in the last 3 decades from an inshore, estuarine, bay fishery in shallow water to the present fishery on the broad shelf areas in depths of 50 fathoms or more (Anderson, 1948).

The design of shrimp-trawling vessels has evolved as the fishery extended into new shrimp grounds. Shallow-draft vessels suitable for sounds and bays were the mainstay of the fishery before 1945 (Springer, 1951). Typical boat designs of the northern central Gulf areas favored the house aft with the working deck forward. A single shrimp trawl was towed from warps leading from the winch, mounted athwartships on the forward deck, through blocks mounted on the port and starboard aftercorners of the house. During this same period, however, the shrimp vessels in the eastern and western Gulf favored a vessel design and deck arrangement similar to the Greek sponge boats (Ringhaver, 1959); on these, the house was located forward and the working deck aft. The winch was installed just aft of the house, and the net was towed from double warps rove through two blocks mounted on one outrigger boom. During the fishing operation, the towing warps were held in position directly over the stern by a deck chain and boom hook arrangement. With minor modification, this deck arrangement gained popularity among offshore shrimp-vessel operators throughout the southeastern United States. It was the first step towards double-rig trawling.

In 1955, Texas shrimp fishermen first attempted to develop the double-rig methods in the Gulf of Mexico (Knake, Murdock, and Cat-

ing, 1959). These efforts evoked widespread industry interest, and many individuals contributed to further development in the following 10 years. The popularity of double-rig fishing led to the conversion of many conventional shrimp vessels. It has so strongly influenced deck and gear arrangement that almost all new vessels are double-rigged.

Although the double-rig method has reached a fairly advanced stage of development, it is still changing. A recent innovation was the introduction of stabilizer planes suspended from the midpoint of the outriggers

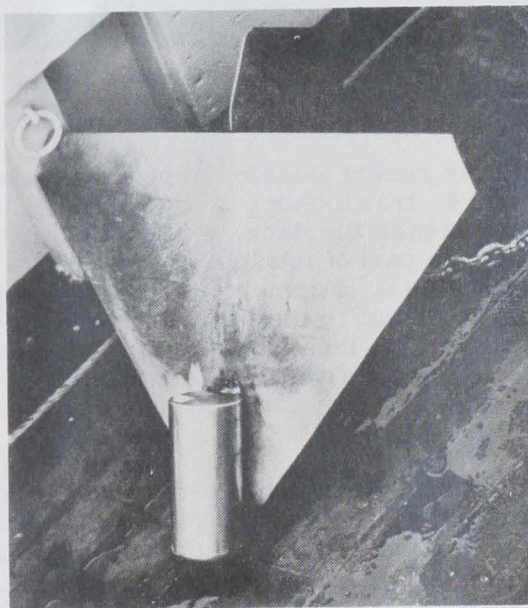


Fig. 1 - Paravane-type stabilizer used by some Gulf shrimp vessels. Shown is stainless steel model; most are galvanized steel.

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during fishing operations --and while the vessel is anchored on fishing grounds. The stabilizers help considerably to dampen the roll of the vessel. One major shrimpboatyard includes stabilizers as standard equipment in all new construction (fig. 1). Normally, the stabilizers are suspended from blocks mounted about two-thirds out on the outrigger booms; occasionally, the stabilizers are suspended from the extremities of the booms (fig. 2). This technique is used in the deepwater (down to 200 fathoms) royal-red shrimp fishery, in which a single trawl is fished from a separate gallows frame.

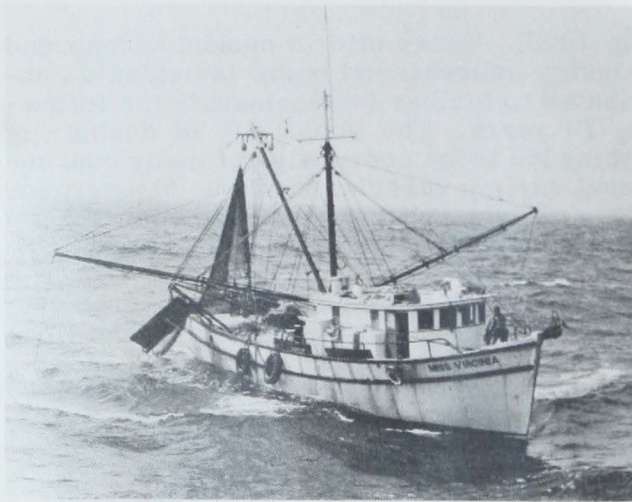


Fig. 2 - Stabilizers suspended from the outriggers' extremities of shrimp vessel fishing a single trawl in deep water.

(Photo: J. B. Rivers)

Another recent development is the use of tag lines on trawl doors. The tag line, long enough to reach the deck, is permanently tied to the upper part of the doors. A pole is used to recover line. Formerly, a crew member had to catwalk out to the end of the outriggers and tie a line to the door's chain for subsequent hauling aboard. This practice was always dangerous, and especially so during heavy seas.

Main trawl winches have increased in size and ruggedness to allow for greater versatility in faster setting and haulback of gear and

greater cable capacity for fishing in deeper waters. Also, they provide for use of larger diameter cable, which reduces breakage, lasts longer, and improves safety.

The following graphs and table provide information about the shrimp vessels over 5 gross tons that operated in the Gulf during 1963 and 1964. They are compiled from published (Lyles, 1965) and unpublished U.S. statistical data. A 10 percent, random sample of the vessel list was used in computing the data. Similar statistics on vessel characteristics are not readily available for the years before 1963.

The characteristics of the Gulf fleet are fairly similar for the 2 years (table); however, the average number of crew members per vessel for 1964 on the double-rigged vessels decreased 0.14. This decrease implies that 5 percent, or 100 vessels of this fleet of over 2,000, employs one man less. Similarly, but to lesser degree, the single-rig trawl data also show reduction in manpower. Increase of single-rig vessels in 1964 over 1963 (table) may indicate conversion of smaller double riggers to single rigs, or entry of vessels from other activities into the shrimp fishery.

Many new vessels, 65 to 75 feet long, are shrimping in international waters off the northeast coast of South America, and elsewhere. The migration to these grounds is indicated in figure 3, which shows fewer vessels in the higher gross-ton category. It also shows that most double-rigged vessels are in the 30- to 49-gross ton class, which coincides with the 50- to 59-foot length groups shown in figure 4. The gross ton-length relation, however, is not well defined for the smallest and largest vessels (figs. 3 and 4). Figure 5 shows the relative size of the nets (footrope measurement) used by double- and single-rig vessels. Footrope measurement of the two nets used by the double riggers have been combined. The lower graph indicates a decrease in size of nets on double-rig vessels for 1964 in the 84- to 90-foot range, and a slight increase in the nets with groundropes

Average Measurements and Characteristics of Shrimp Trawlers Operating in the Gulf of Mexico During 1963 and 1964

	1963					1964					
	Total Vessels	Gross Tonnage	LOA	Men in Crew	Size of Net ^{1/}	Total Vessels	Gross Tonnage	LOA	Men in Crew	Size of Net	Main Engine Power ^{2/}
	No.	Tons	Feet	No.	Feet	No.	Tons	Feet	No.	Feet	Horsepower
Double Rig	2,051	37.2	53.6	2.85	43.5	2,059	39.3	55.2	2.71	44.5	197
Single Rig	646	17.4	45.3	2.12	57.0	723	18.4	45.4	2.06	55.5	145

^{1/}Net size measurement is length of leadline.

^{2/}HP data not available for 1963.

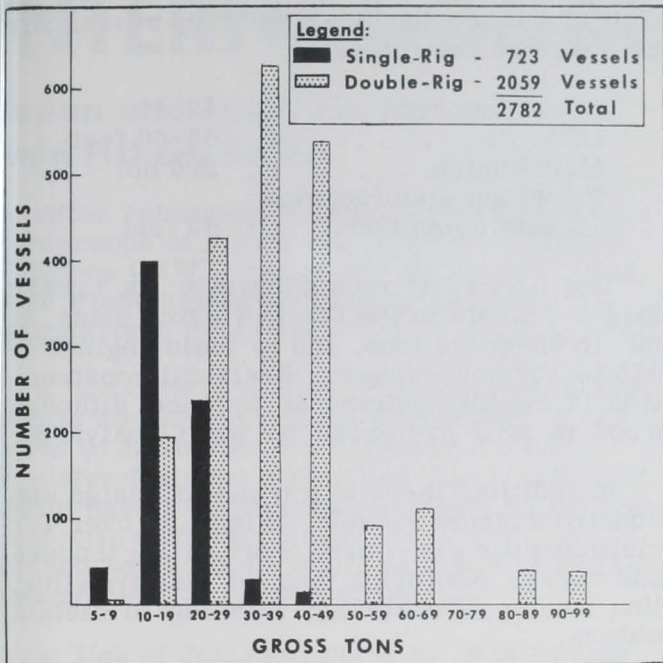


Fig. 3 - Number of shrimp-fishing vessels over 5-gross tons operating in the Gulf of Mexico (U. S. A.) during 1964, single- and double-rig.

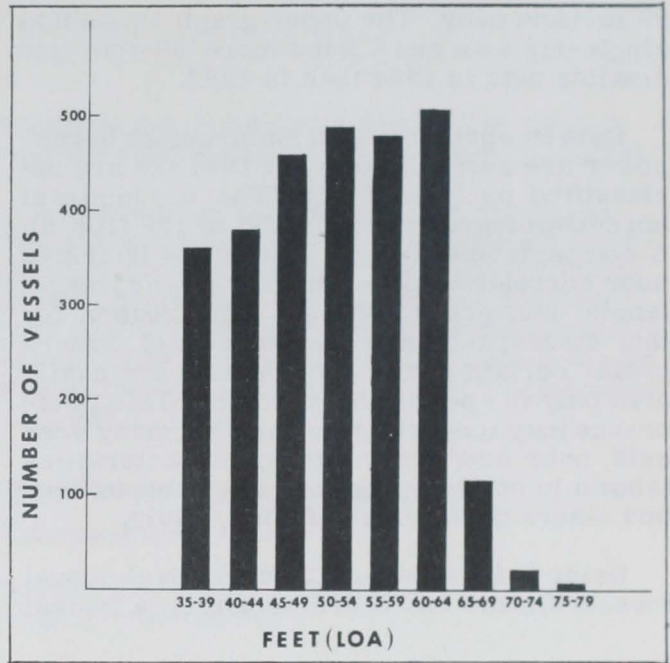


Fig. 4 - Length (LOA) and number of shrimp vessels operating in the Gulf of Mexico during 1964. Total vessels: 2,782.

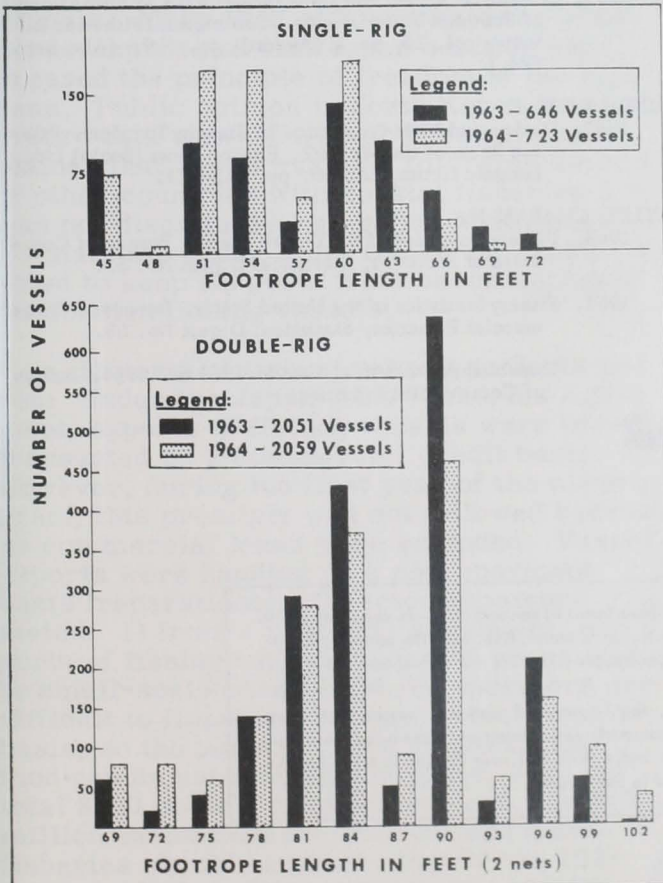


Fig. 5 - Number of shrimp-fishing vessels and their trawl net size, operating in the Gulf during 1963 and 1964, single- and double-rig shown separately.

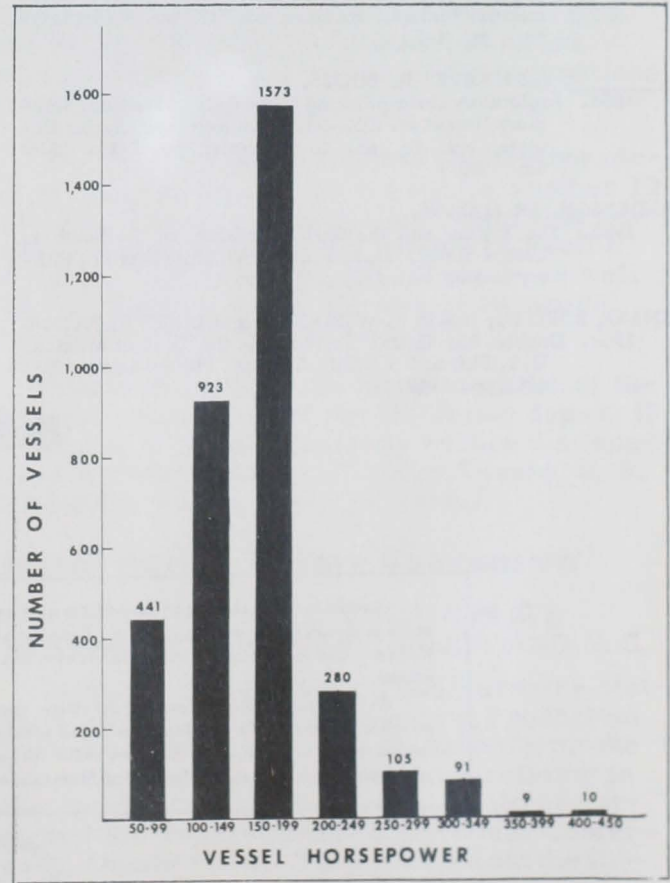


Fig. 6 - Number of shrimp vessels and their main engine horsepower, operating in the Gulf of Mexico during 1964--single- and double-rig combined.

99 feet and over. The upper graph shows that single-rig vessels used more 60-foot and smaller nets in 1964 than in 1963.

Data on shrimp vessel main-engine horsepower are available only for 1964 and are not classified by type of rig. The predominant horsepower preference is 150 to 199 (fig. 6). A comparison of figures 3, 4, and 6 indicates poor correlation between horsepower, vessel length, and gross tonnage. The reason for this discrepancy may be that vessel owners prefer certain model engines that are available only in specific horsepower. This preference may account for the fact that many vessels, over and under typical characteristics (shown in opposite column), are overpowered and others underpowered (Juhl, 1961).

Using data showing certain vessel modal measurements and characteristics, a typical

Gulf of Mexico double-rig shrimp vessel may be described as follows:

Gross tonnage	42-45
LOA	55-60 feet
Main engine.	200 hp.
Trawl net size footrope 2 nets combined.	90 feet

The present trend, however, is toward larger vessels in the 65- to 75-foot class, of 60- to 80-gross tons, and to main engines of 275 to 300 horsepower. Steel-hull construction is rapidly gaining acceptance, although wood is still preferred by most boatyards.

In addition, there is a trend to design and construct larger vessels, 80 feet and over, for multipurpose use--as offshore oil rig tenders and survey platforms, and for fish trawling, line fishing, and shrimp trawling in distant waters.

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