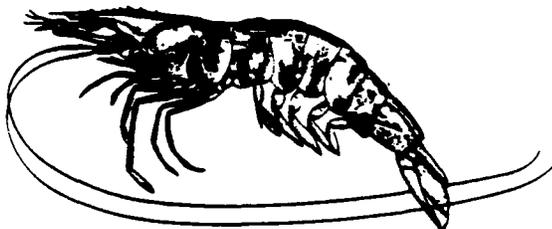


DRAFT
AMENDMENT NUMBER 5
TO
THE FISHERY MANAGEMENT PLAN
FOR THE
SHRIMP FISHERY OF THE GULF OF MEXICO
UNITED STATES WATERS
INCLUDES ENVIRONMENTAL ASSESSMENT



JANUARY 1991

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I. Introduction

A fishery management plan for the shrimp fishery in the Gulf of Mexico (FMP) was prepared by the Gulf of Mexico Fishery Management Council and was implemented as federal regulation on May 15, 1981. The principal thrust of the plan was to enhance yield in volume and value by deferring harvest of small shrimp to provide for growth. This was achieved by establishing a cooperative Tortugas shrimp sanctuary with the state of Florida to close to shrimp trawling an area where small pink shrimp comprise the majority of the population most of the time. A cooperative 45-day seasonal closure was established with the state of Texas to protect small brown shrimp emigrating from bay nursery areas. An area of Florida Bay was zoned seasonally for either shrimp or stone crab fishing to avoid gear conflict.

Amendment No. 1 provided the Regional Director of NMFS with the authority after conferring with the Council to adjust by regulatory amendment the size of the tortugas sanctuary or extent of the Texas closure or to eliminate either closure for one year.

Amendment No. 2 updated catch and economic data in the FMP, and Amendment No. 3 resolved another shrimp-stone crab gear conflict on the west center Florida coast.

Amendment No. 4 partially approved in 1988 identified problems which developed in the fishery and revised the objectives of the FMP accordingly. The annual review process for the Tortugas sanctuary was simplified, and the Council and Regional Director review for the Texas closure was extended to February 1st. Disapproved was a provision that white shrimp taken in the EEZ were to be landed in accord with a state's size possession regulations to provide consistency and facility of enforcement with the state of Louisiana. This latter action was to have been implemented at such time when Louisiana provided for an incidental catch of undersized white shrimp in the fishery for seabobs. This proposed action was disapproved with the recommendation that it be resubmitted under the expedited 60-day Secretarial review schedule after Louisiana provided for a bycatch of undersized white shrimp in the directed fishery for seabobs. This resubmission was made in February of 1990 and applied to white shrimp taken in the EEZ and landed in Louisiana. It was approved and implemented in May of 1990.

NMFS in July, 1989, published revised guidelines for fishery management plans that interpretatively address the Magnuson Act national standards (50 CFR Part 602). These guidelines require each FMP to include a scientifically measurable definition of overfishing and an action plan to arrest overfishing should it occur. The definition and action plan are not currently included in the FMP and are the subject of this amendment.

Included in the management unit are brown, pink, white, royal red, and rock shrimp and seabobs. In the U.S. Gulf fishery rock shrimp are taken as bycatch in the directed fishery for other shrimp, primarily browns and pinks.

The OY is determined to be all the shrimp that can be taken during open seasons in permissible areas in a given fishing year with existing gear and technology. The Council has determined that, because of the annual nature of the resource, a numerical value for OY cannot be calculated for any given year until the environmental factors can be determined and evaluated. However, under optimum environmental conditions and maximum effort, the maximum probable catch for brown, white and pink shrimp is estimated to be 216 million pounds of tails. Fishing, however, will not be stopped when this numerical estimate is reached.

A 1989 assessment of brown, white and pink shrimp in the U.S. Gulf of Mexico by NMFS (Nance, Klima and Czapl, 1989) found no apparent parent stock recruitment relationship for brown or pink shrimp. An apparent stock-recruitment relationship was observed for white shrimp; however factors unrelated to fishing could be generating the relationship. The assessment did report a significant

increase in the number of recruits per parent for brown shrimp but found none for white shrimp. Recruitment of pink shrimp in the Tortugas fishery had been stable until 1985 but has declined significantly since then.

The FMP also provides that royal red shrimp differ from brown, white and pink shrimp in that they are not estuarine dependent but exist in a relatively constant environment in the deeper waters of the Gulf (100 to 300 fathoms). They are not an annual crop but are harvested from grounds believed to contain at least five year classes. Thus, they conform more closely to a classical Schaefer-type fishery. For this reason, the optimum yield of royal red shrimp should be the total pounds of royal red shrimp which can be harvested without biologically overfishing this resource. An estimate of the allowable catch is 392,000 pounds (tails). OY is set at this figure and fishing will stop when it is reached.

The fishery for royal red shrimp has declined from several hundred thousand pounds (tails) annually to virtually no current production. The decline is due to high production costs and poor markets for this species.

No management is provided in the FMP for seabobs, a small species which is taken in shallow waters off Louisiana and east Texas. Neither is management provided for rock shrimp which are primarily taken as bycatch in the brown and pink shrimp fisheries.

II. Description and Utilization Patterns

U.S. commercial landings of Gulf shrimp averaged 255 million pounds (live weight) during the period 1983 to 1987. Landings in 1988 were 226 million pounds down 12 percent from 257 million pounds in 1987. The exvessel value of landings was \$414 million.

All U.S. shrimp landings for the five-year period 1983-1987 averaged 330 million pounds.

Supply cannot meet the demand and imports have made up the difference. Each year since 1982 imports have set a new record, reaching 504 million pounds in 1988 (NMFS statistics).

Gulf shrimp abundance continues to be the result of recruitment, largely controlled by environmental driving forces. In recent years the development of a strong inshore (bay) fishery on juvenile shrimp, whose growth potential has not been reached, has resulted in lower recruitment to the offshore fishery and lessened the potential for increasing yield by deferring harvest in offshore waters. Both the states of Louisiana and Texas where much of the inshore fishery occurs are currently developing and implementing plans to address this issue.

The Tortugas pink shrimp fishery was stable with annual production of about 10 million pounds until 1985. Since then recruitment has declined, and production has been reduced to about six million pounds. The cause of the decline in recruitment is not known but is believed to be related to environmental changes in the Everglades nursery area.

Strong markets for small shrimp and poor economic conditions in the shrimp fishery have generated increased production of seabobs, a small, near shore species of shrimp occurring in the Northern Gulf, with principal landings in Louisiana. Catch data are poor but landings in recent years have ranged from about 4 million pounds to a high of 9 million pounds in 1986. Catch per unit of effort declined to record lows in 1987 and 1988.

Rock shrimp in the U.S. Gulf is primarily a bycatch from other shrimp fisheries and annual production is about one million pounds.

Royal red shrimp are found in deep water where production costs are high. Markets for this species are very poor, and there has been little production in recent years. Annual landings of less than 275,000 pounds were recorded in past years.

Requirements to modify trawl gear or trawling procedures to protect threatened and endangered species of sea turtles by the Secretary of Commerce under the Endangered Species Act have caused social and economic disruption in the Gulf shrimp fishery.

III. Issues to be Addressed

1. Compliance with 602 Guidelines which require a definition of "overfishing" and measures to restore overfished stocks.
2. Revision of seasonal closure to shrimp fishing off Texas to conform with closure of state waters.

IV. Proposed Action

1. The period of the Texas closure is extended to conform with a change in the closure of state waters.
2. Seabobs and rock shrimp are removed from the management unit.
3. Overfishing of Gulf shrimp in the management unit is defined and measures to restore overfished stocks are added.

V. Problems in the Fishery

In the current FMP as amended the Council has identified the following problems associated with the fishery and the present management regime and has prepared the plan objectives where possible to address and alleviate them.

1. Conflict among user groups as to area and size at which shrimp are to be harvested.
2. Discard of shrimp through the wasteful practice of culling.
3. The continuing decline in the quality and quantity of estuarine and associated inland habitats.
4. Conflicts with other fisheries such as the stone crab fishery in southern Florida, the groundfish fishery of the north central Gulf, and the Gulf's reef fish fishery.
5. Incidental capture of sea turtles.
6. Loss of gear and trawling grounds due to man-made obstructions.
7. Partial lack of basic data needed for management.
8. Increasing catch of small shrimp in inshore waters.

9. Pulse fishing resulting from seasonal closures.
10. Loss of access to productive shrimp fishing grounds off Mexico.
11. Possible loss of shrimp to Mexico through transboundary migration.
12. Competition in shrimp sizes targeted by management with prevalent sizes produced by foreign mariculture operations.
13. Inconsistency in some state and federal regulations.
14. Excessive fishing effort employed in the fishery.
15. Limited enforcement capabilities.

VI. SPECIFIC MANAGEMENT OBJECTIVES

The following are the specific management objectives of the existing FMP as amended.

1. Optimize the yield from shrimp recruited to the fishery.
2. Encourage habitat protection measures to prevent undue loss of shrimp habitat.
3. Coordinate the development of shrimp management measures by the Gulf of Mexico Fishery Management Council with the shrimp management programs of the several states, where feasible.
4. Promote consistency with the Endangered Species Act and the Marine Mammal Protection Act.
5. Minimize the incidental capture of finfish by shrimpers, when appropriate.
6. Minimize conflicts between shrimp and stone crab fishermen.
7. Minimize adverse effects of obstructions to shrimp trawling.
8. Provide for a statistical reporting system.

VIII. ACTIONS IN THIS AMENDMENT

ACTION 1. ADJUSTMENT OF SEASONAL TEXAS CLOSURE FRAMEWORK

A. Measure 2 of the FMP as amended is revised as follows:

Measure 2: Establish with the state of Texas a cooperative closure of the Gulf waters under Texas jurisdiction and the adjacent U.S. EEZ when a substantial portion of the brown shrimp in these waters weighs less than a count of 65 tails to the pound (39 heads-on shrimp to the pound). The U.S. Department of Commerce will close the EEZ, and the time of closing shall correspond to the closure by Texas of its Gulf waters. Closure normally occurs 30 minutes after sunset on May 15 to 30 minutes after sunset on July 15th; however, the effects of climatic variation on shrimp growth may necessitate

flexibility in the closing and opening dates to provide for an earlier, later, longer, or shorter closure of no more than 90 days nor less than 45 days. Provision is to be made to allow taking of royal red shrimp beyond the 100 fathom contour (where brown shrimp do not occur).

NMFS will monitor biological, economic, ecological, and sociological data collected through implementation of the plan and provided by other surveys and research. NMFS will assess both the adverse impacts and benefits derived from the seasonal closure in the EEZ and advise the Regional Director and the Council of the findings by December 15th. The Council may use its Scientific and Statistical Committee and Advisory Panel to review and advise on the findings.

The Regional Director shall have the authority, after consultation with the Council, to implement action to revise this management measure through the Regulatory Amendment process. Criteria to be considered in reaching the decision to amend the regulations include:

1. Changes in pounds of shrimp caught and/or gross and/or net exvessel value to the industry resulting from the closure on a state by state basis.
2. Adverse effects from an increase in fishing pressure as a result of the closure which causes a decrease in catch per unit effort.
3. Adverse effects from stress on support facilities for the shrimp fleet because of fleet migration or any other changes in work patterns resulting from the closure.
4. Any other information determined by the Regional Director to be relevant.

The Regional Director may, after determining that benefits may be increased or adverse impacts be decreased, take either of the following actions to achieve the goals and objectives of the Shrimp Fishery Management Plan consistent with the National Standards and other applicable Federal laws. The first action is considered to be less drastic and may be employed where a lesser degree of change is required.

1. Modify the geographical scope of the extent of the seasonal closure of the EEZ off Texas west of a line beginning at latitude 29° 32' 06.784" north, longitude 93° 47' 41.699" west, drawn in the general direction of 166.6° true and ending at the seaward limit of the EEZ at latitude 26° 11' 24" north, longitude 92° 53' 00" west. (This line is an extension of the boundary of Texas and Louisiana through the territorial sea into the EEZ.)
2. Eliminate the closure of the EEZ off Texas for one season.

The Regional Director shall by February 1st of the following year publish his intent to take action as provided in 1 and 2 above or not to take action.

Rationale:

Texas has revised its shrimping regulations to provide for an annual seasonal closure of offshore waters (9 nautical miles) from May 15 through July 15 and to eliminate an exemption allowing daytime trawling within four fathoms during that period. The closure was expanded from a 45-day closure, June 1 to July 15 (not to exceed 60 days), to extend protection to juvenile brown and pink shrimp which begin to emigrate from South Texas bays in May. The closure and reopening would normally become effective at 30 minutes after sunset on these dates.

Texas researchers have found that shrimp in the warmer waters of the lower coast grow more quickly

and move Gulfward earlier than their cohorts on the upper coast. The 45-day cooperative closed season was established as an overall average appropriate for the entire 400 mile coastline of Texas.

The FMP established a seasonal closure of all federal waters off Texas to be compatible with closure of Texas waters in order to enhance protection of juvenile shrimp to allow additional growth and to facilitate enforcement of the closure. It has proved to be successful in that a simulation analysis of the closure has indicated that gains in yield have been obtained in each year of closure.

The change in the state closure became effective in 1990, but the framework provisions in the plan allowed an extended closure of federal waters of up to only 60 days. Thus, state waters closed on May 15 and adjoining federal waters remained open until May 17, therefore complicating enforcement of the state closure.

The state's elimination of the four fathom exemption for taking white shrimp in state waters conforms to a request made by the Council. That fishery had caught more juvenile brown shrimp than large white shrimp, thus reducing the benefits to be derived from the cooperative closure.

Implementation of this action would continue to reduce growth overfishing and enhance yield by deferring harvest of small shrimp. In all years that cooperative seasonal closures have been implemented off Texas (1981-1988) simulation analyses have shown a resulting increase in total value of shrimp landed (Nance and Klima, 1989). The increase is due to a usual increase in total pounds landed resulting from a longer growth period as well as a higher value for larger shrimp. It will also enhance compliance and enforcement by providing compatible state and federal regulations. The action addresses Objective 1: Optimize the yield from shrimp recruited to the fishery and Problem 13: Inconsistency in some state and federal regulations.

B. Rejected alternative: No change.

Measure 2: Establish with the state of Texas a cooperative closure of the Gulf waters under Texas jurisdiction and the adjacent U.S. EEZ when a substantial portion of the brown shrimp in these waters weighs less than a count of 65 tails to the pound (39 heads-on shrimp to the pound). The U.S. Department of Commerce will close the EEZ, and the time of closing should correspond to the closure by Texas of its Gulf waters. Closure normally occurs June 1st to July 15th; however, the effects of climatic variation on shrimp growth may necessitate flexibility in the closing and opening dates to provide for a closure of no more than 60 days. Provision is to be made to allow taking of royal red shrimp beyond the 100 fathom contour (where brown shrimp do not occur).

NMFS will monitor biological, economic, ecological and sociological data collected through implementation of the plan and provided by other surveys and research. NMFS will assess both the adverse impacts and benefits derived from the seasonal closure in the EEZ and advise the Regional Director and the Council of the findings by December 15th. The Council may use its Scientific and Statistical Committee and Advisory Panel to review and advise on the findings.

The Regional Director shall have the authority, after consultation with the Council, to implement action to revise this management measure through the Regulatory Amendment process. Criteria to be considered in reaching the decision to amend the regulations include:

1. Changes in pounds of shrimp caught and/or gross and/or net expressed value to the industry resulting from the closure on a state by state basis.
2. Adverse effects from an increase in fishing pressure as a result of the closure which causes a decrease in catch per unit effort.

3. Adverse effects from stress on support facilities for the shrimp fleet because of fleet migration or any other changes in work patterns resulting from the closure.
4. Any other information determined by the Regional Director to be relevant.

The Regional Director may, after determining that benefits may be increased or adverse impacts be decreased, take either of the following actions to achieve the goals and objectives of the Shrimp Fishery Management Plan consistent with the National Standards and other applicable Federal laws. The first action is considered to be less drastic and may be employed where a lesser degree of change is required.

1. Modify the geographical scope of the extent of the seasonal closure of the EEZ off Texas west of a line beginning at latitude 29° 32' 06.784" north, longitude 93° 47' 41.699' west, drawn in the general direction of 166.6° true and ending at the seaward limit of the EEZ at latitude 26° 11' 24" north, longitude 92° 53' 00" west. (This line is an extension of the boundary of Texas and Louisiana through the territorial sea into the EEZ.)
2. Eliminate the closure of the EEZ off Texas for one season.

The Regional Director shall by February 1st of the following year publish his intent to take action as provided in 1 and 2 above or not to take action.

Rationale:

No change would result in different closure periods for state and federal waters because the duration of the state closure is 62 days, while the federal closure is restricted to no more than 60 days. In 1990 state waters closed on May 15, and federal waters closed on May 17. While the majority of small brown shrimp emigrating from the southernmost Texas bays were afforded protection by the 9-mile state closure for the 2-day period, enforcement by state law enforcement officers was made considerably more difficult as federal waters remained open to trawling.

The two principal management measures of this FMP, the Texas closure and the Tortugas Shrimp Sanctuary are both cooperative state-federal efforts. Because of the estuarine dependency of brown and pink shrimp, successful management in federal waters is dependent on recruitment from state controlled waters. Consistent and coordinated management is more productive and simplifies understanding and compliance by fishermen.

ACTION 2: DELETION OF ROCK SHRIMP AND SEABOBS FROM THE MANAGEMENT UNIT

A. Section 8.2.1 is revised as follows:

8.2.1 Management Unit

This management unit is comprised of brown, white, pink and royal red shrimps in the area of jurisdiction of the Gulf of Mexico Fishery Management Council as well as the territorial seas adjacent thereto and the associated bays, inlets, wetlands and upland areas as appropriate. Federal implementation of regulations will occur only in the EEZ. On the east coast of the United States a natural biological break in fauna is found on the southeast coast of Florida. On the western edge the international boundary between Mexico and the U.S. serves as a political break.

Rationale:

Seabobs and rock shrimp are to be removed from the management unit but are retained in the fishery for data gathering purposes. There are insufficient catch and effort data to redefine MSY for these species. The fishery for both species is largely indirected with rock shrimp production being mostly as bycatch in the brown and pink shrimp fisheries. A large portion of the seabob harvest occurs in state waters because this species occurs along the beaches in the northwestern Gulf. There are currently no federal regulations for harvest of either species.

B. Rejected alternative: no change.

8.2.1 Management Unit

This management unit is comprised of brown, white, pink, royal red, seabobs and rock shrimps in the area of jurisdiction of the Gulf of Mexico Fishery Management Council as well as the territorial seas adjacent thereto and the associated bays, inlets, wetlands and upland areas as appropriate. Federal implementation of regulations will occur only in the EEZ. On the east coast of the United States a natural biological break in fauna is found on the southeast coast of Florida. On the western edge the international boundary between Mexico and the U.S. serves as a political break.

Rationale:

Insufficient data are available to re-evaluate the MSYs for seabobs and rock shrimp. Thus, a definition of overfishing and management measures to prevent overfishing cannot be developed at this time.

Rock Shrimp (both species combined)

The highest catch was two million pounds in 1986 (Figure 1). Rock shrimp is a mixture of directed and incidental fishery off the Florida coast and is an incidental bycatch elsewhere in the U.S. Gulf. In addition to being a bycatch and/or a directed fishery, there is a low number of fisherman interviews which makes the fishing effort estimates unreliable. The FMP states that, "For rock shrimp, MSY was estimated at 1.1 million pounds of tails using a Schaefer model. This estimate is a very poor one because most landings are incidental catch, making effort estimates unreliable." Since 1980, rock shrimp MSY has been exceeded three times, with a high of two million pounds in 1986.

Seabobs

The FMP didn't provide an estimate of MSY because of a lack of effort data. Seabobs have been treated as an incidental catch to the white shrimp fishery. The FMP describes an average of 4.3 percent of the total catch of white shrimp (e.g., 1.4 million pounds of seabob tails) between 1959-1975. The FMP used the 1.4 million pound estimate as the best MSY. In recent years, catch peaked in 1986 at approximately 900,000 pounds (Figure 2).

ACTION 3: SPECIFICATION OF OPTIMUM YIELD AND PREVENTION OF OVERFISHING

Section 6.2 is revised as follows:

Section 6.2 Specification of Optimum Yield and Prevention of Overfishing

In deriving OY from MSY as adjusted by environmental conditions, the Council paid close attention to the following criteria:

1. Prevent recruitment overfishing of species in the management unit.
2. Provide each associated processing industry with the count size of the shrimp resource most suited to the several needs.
3. Prevent discrimination among fishermen based on boat/vessel size.
4. Eliminate conditions wherein boat/vessels would shrimp in the EEZ and claim the landings came from the territorial sea for inland waters and vice versa, depending on location of open and/or closed waters.
5. Protect the resource during specific periods to improve yields.

6.2.1 Brown, White and Pink Shrimp

OY is determined to be: All the shrimp that can be taken during open seasons in permissible areas in a given fishing year with existing gear and technology without resulting in recruitment overfishing. The Council has determined that, because of the annual nature of the resources, a numerical value for OY cannot be calculated for any given year until the environmental factors can be determined and evaluated. However, under optimum environmental conditions and maximum effort, the maximum probable catch for brown, white and pink shrimp is estimated to be 216 million pounds of tails.

Rationale: The qualification regarding recruitment overfishing (underlined) is added to allow this definition to comply with the new definition of overfishing and measures to prevent it.

6.2.1.1 Overfishing Brown, White and Pink Shrimp

The definitions and rationale for overfishing shrimp were developed at a shrimp overfishing workshop (Klima, Nance, Martinez, and Leary, 1990). A minimum level of parent stock (e.g. Nance, Klima, and Czapla, 1989) was deemed by the participants to provide the best definition of overfishing for these three species. Recruitment for these species is often a reflection of environmental driving forces and, therefore, is not the best indicator of overfishing.

The number of parents, sexually mature shrimp for each month during the spawning period for that species, was calculated by means of a virtual population analysis (VPA), (Ricker, 1975). A VPA uses catch by age, instantaneous rate of natural mortality, and instantaneous rate of fishing mortality to estimate numbers of shrimp at different ages. The indices for the parent stock varies among the species because different ages and time periods were used in the calculations. For example, the index for brown shrimp represents the number of seven month or older shrimp over a four month period while that for pink shrimp represents the number of 5+ month old shrimp over a 12 month period.

**CRITERIA USED TO DETERMINE NUMBER OF INDIVIDUALS
IN THE SPAWNING STOCK**

<u>SPECIES</u>	<u>TIME FRAME OF MAX SPAWNING</u>	<u>AGE OF PARENTS</u>	<u>NATURAL MORTALITY</u>
Brown Shrimp	Nov - Feb	>7 Months	.275
White Shrimp	April - August	>5 Months	.275
Pink Shrimp	July - June	>5 Months	.300

6.2.1.1.1 Brown shrimp recruitment overfishing is indicated where parent stock levels are reduced below 125 million shrimp. This value is slightly lower than the 1983 level of parent stock which is the lowest observed value since 1960 (Figure 3). Parent stock for brown shrimp is defined as the number of age 7+ (months) shrimp during the period of November through February.

Rationale:

- Parent stock is presently the best index to use in defining overfishing for brown shrimp. Currently, recruitment is a reflection of environmental conditions.
- 1980's data should be used to set lower limits for parent stock because fishing intensity and environmental conditions were different during the 1980's when compared to the 1960's and 1970's.
- Catch, effort (nominal days fished) and recruitment have increased from 1960-89 (Figures 4, 5 and 6).
- Annual catch per effort has fluctuated around 600 pounds per day for the past 25 years. The decline since 1985 is similar to other declines in the 1960's and 1970's.
- Parent stock levels have shown no trend during the 1960's-1980's.
- Habitat and environmental conditions have changed since 1960; nursery areas have gradually increased during this time span.
- If habitat/environment changes rapidly, the parent stock may be reduced. Presently, the observed levels of parent stock can sustain the population.
- There is no indication of recruitment overfishing for brown shrimp due to high levels of recruitment.
- There is no potential for an increase in brown shrimp yield (pounds) with an increase in effort.
- Reasonably reliable parent stock data are available for brown shrimp via virtual population analysis and resource surveys.

6.2.1.1.2 White shrimp recruitment overfishing is indicated when parent stock level are reduced below 600 million shrimp (Figure 7). Parent stock for white shrimp is defined as the number of age 5+ (months) shrimp during the period April through August.

Rationale:

- Parent stock is presently the best index to use in defining overfishing for white shrimp. Currently, recruitment is a reflection of environmental conditions.
- Fishing intensity and environmental conditions were different during the 1980's when compared to the 1960's and 1970's. However, since 1960, parent stocks of 615 million and above have resulted in adequate recruitment. Low recruitment levels were observed when parent stock decreased below 500 million shrimp (Figure 8).
- Catch effort (nominal days fished), and recruitment have increased from 1960-86. However, there has been a downward trend in production (catch) over the last three years (1987-89) (Figures 9, 10, and 11).
- Catch per effort has fluctuated around 400 pounds per day. The decline since 1986 is similar to other declines in the 1960's and 1970's.
- Parent stock levels have increased during the 1960's-1980's.
- Habitat and environmental conditions have changed since 1960; nursery areas have gradually increased during this time span.
- If habitat/environment changes rapidly, the parent stock may be reduced. Presently, the observed stock can sustain the population.
- Since 1960, recovery of white shrimp populations was observed even after parent stock levels decreased below 500 million shrimp.
- There is no potential for an increase in white shrimp yield (pounds) with an increase in effort.

6.2.1.1.3 Pink shrimp recruitment overfishing in the eastern Gulf of Mexico (statistical areas 1-12) is indicated when parent stock levels are reduced below 100 million shrimp. Parent stock for pink shrimp is defined as the number of shrimp age 5+ (months) during the period July through June. Pink shrimp in the western U. S. Gulf are not included in this definition because mixed catches of brown and pink shrimp there are not separated and are landed, sold, and statistically treated as brown shrimp.

Rationale:

- Parent stock is presently the best index to use in defining overfishing for pink shrimp. Currently recruitment is a reflection of environmental conditions.
- Since parent stock values for the 1960's may have been underestimated, the 1970's-1980's data should be used to set the lower limit for pink shrimp parent stock. The lowest parent stock level observed since 1970 was slightly greater than 100 million shrimp and had no adverse effect on recruitment (Figure 12).
- Catch and recruitment have remained steady during 1960-85 but they exhibit a downward trend over the last three years (1986-88). Effort (nominal days fished) has increased beginning in 1972. Effort and catch per effort declined sharply during 1986-88 (Figures 13, 14, 15, and 16).

- Parent stock levels showed no trend during the 1960's and slightly higher levels in the 1970's and 1980's except for a sharp peak in 1984-85.
- There has been a shift in the fishery to more northern areas since 1972-73; thus, parent stock estimates for the 1960's may be underestimated.
- Hypotheses regarding the recent decline in the pink shrimp fishery include:
 1. Habitat degradation/seagrass die-off in Florida Bay.
 2. Lack of freshwater inflow, precipitation, hurricanes.
 3. Use of pesticides for mosquito control in S. Florida.
- In Cuba, pink shrimp landings have also declined in the late 1980's. Hypothesis is that the decline is due to a decrease in precipitation.
- A large portion of the pink shrimp stock is not accessible to trawling due to bottom topography.
- There is no potential for an increase in pink shrimp yield (pounds) with an increase in effort.

6.2.1.1.4 Action to be taken if recruitment overfishing on brown, white, or pink shrimp should occur.

If parent stock levels are reduced below the specified index level for a species, NMFS will advise the Council and closely monitor the stock. Scientists will forecast recruitment for the coming year-class and determine the amount of fishing effort that will allow the parent stock to exceed the minimum index value. Scientists will also project the expected fishing effort to be expended on that year-class and its effect on the parent stock. The differences between the amount of fishing effort required to increase the parent stock and the expected fishing effort will be compared to see if further action is necessary.

If parent stock for the species is predicted to remain below the index for a second consecutive year, the Council will implement any of the following actions deemed appropriate:

If fishing effort needs to be reduced, there are multiple options such as reducing fishing effort at the start of the season, reducing fishing effort at the end of the season, or some combination of both, area and seasonal closures, trip limits, or quotas. This action would be accomplished by regulatory amendment and would include a regulatory impact review and an environmental assessment.

6.2.2. Royal Red Shrimp

Overfishing royal red shrimp is defined as fishing in excess of OY. Royal red shrimp differ from brown, white, and pink shrimp in that they are not estuarine dependent but exist in a relatively constant environment in the deeper waters of the Gulf (100 to 300 fathoms). They are not an annual crop but are harvested from grounds believed to contain at least five year classes. Thus, they conform more closely to a classical Schaefer-type fishery. For this reason, the optimum yield of royal red shrimp should be the total pounds of royal red shrimp which can be harvested without biologically overfishing this resource.

Historically, the annual MSY was estimated to be 392 thousand pounds of tails at a level of 1290 days fished. OY was set at MSY. Fishing will close when OY is reached. Currently, royal red shrimp continue to be an underexploited resource due to low demand and high cost of production.

Rationale: There is no change proposed in the management of this species. Recent landings are shown in Figure 17. Production has declined because of the higher costs of fishing in deeper water and a soft market for this species.

IX. Environmental Consequences

Physical Environment

The actions proposed in this regulatory amendment will have no impact on the physical environment.

Fishing Resources

The proposed action is intended to protect shrimp stocks from recruitment overfishing while enhancing yield from stocks recruited to the fishery.

Human Environment

The human environment in this instance is closely related to the impact on the fisheries. A determination of the net impact on the users of the resource by the proposed action will better enable the Council and the Regional Director to establish a more responsive management regime.

Effect on Endangered Species and Marine Mammals

NOAA initiated consultation under Section 7 of the Endangered Species Act (ESA) regarding the impact of this proposed rule on endangered and threatened sea turtles. A biological opinion resulting from that consultation found that neither the directed fisheries nor the proposed rule will jeopardize the recovery of endangered or threatened species or their critical habitat.

NOAA has implemented shrimping regulations under ESA to reduce bycatch of seaturtles in shrimp trawls. This proposed action would not affect these regulations or increase the likelihood of bycatch of endangered or threatened species.

Effect on Wetlands

The proposed action has no effect on any flood plains, wetlands, trails, or rivers.

Vessel Safety

The proposed actions do not impose requirements for use of unsafe (or other) gear nor do they direct fishing effort to periods of adverse weather conditions.

Data Collection

This proposed action does not contain a collection of information requirement and, therefore, is not subject to the Paperwork Reduction Act.

Scientific Data Needs

The implementation of this amendment requires a monitoring of the size and distribution of brown shrimp in Texas estuaries and adjacent waters in order to implement a cooperative seasonal closure to defer harvest of juveniles. This collection of data is currently conducted by the Texas Parks and Wildlife Department and the Southeast Fisheries Center (SEFC) of NMFS.

To monitor shrimp stocks to determine whether overfishing occurs, the SEFC of NMFS currently monitors shrimp catch by size (age) to estimate recruitment and parent stock. No additional collection of scientific data would be required by this amendment.

Federalism

This proposed action does not contain policies with federalism implications sufficient to warrant preparation of a federalism assessment under E.O. 12612.

Coastal Zone Management Consistency

The Assistant Administrator has determined that this proposed action will be implemented in a manner that is consistent to the maximum extent practicable with the approved coastal zone management program of Florida, Alabama, Mississippi, and Louisiana. This determination has been admitted for review by these states under Section 307 of the Coastal Zone Management Act.

CONCLUSION

Mitigating measures related to the proposed action: no significant environmental impacts are expected; therefore, no mitigating actions are proposed.

Unavoidable adverse effects with implementation of the proposed action negative net economic benefits are discussed in the Regulatory Impact Review.

Irreversible and irretrievable commitment of resources involved with the proposed action government costs are not expected to change significantly, if at all, as a result of this action.

Recommendation

Finding of No Significant Environmental Impact

In view of the analysis presented in this document, I have determined that the proposed action in this amendment to the Fishery Management Plan for Gulf Shrimp would not significantly affect the quality of the human environment with specific reference to the criteria contained in NDM 02-10 implementing the National Environmental Policy Act. Accordingly, the preparation of a Supplemental Environmental Impact Statement for this proposed action is not necessary.

Approved: _____
Title

_____ Date

Responsible Agencies

Gulf of Mexico Fishery Management Council
Lincoln Center, Suite 881
5401 West Kennedy Boulevard
Tampa, Florida 33609
813-228-2815

List of Agencies and Persons Consulted

Gulf of Mexico Fishery Management Council's

- Scientific and Statistical Committee
- Shrimp Advisory Panel
- Shrimp Stock Assessment Panel

Coastal Zone Management Programs

- Louisiana
- Mississippi
- Alabama
- Florida

National Marine Fisheries Service

- Southeast Fisheries Center
- Fisheries Operations Branch - Southeast Regional Office

Trade Associations:

- Texas Shrimp Association
- Louisiana Shrimp Association
- Concerned Shrimpers of America
- American Shrimp Processors Association
- Southeastern Fisheries Association

List of Preparers

Gulf of Mexico Fishery Management Council

- Terrance R. Leary, Biologist
- Antonio B. Lamberte, Ph.D., Economist

Much of the analysis on overfishing and all figures included are from the report of the Workshop on Shrimp Recruitment Overfishing (Klima, Nance, Martinez, and Leary, 1990).

Location and Date of Public Hearings

October 22, 1990	7:00 p.m.	Corpus Christi, Texas	Airport Holiday Inn
October 23, 1990	7:00 p.m.	New Orleans, Louisiana	Airport Hilton Hotel
October 24, 1990	7:00 p.m.	Mobile, Alabama	Mobile Hilton Hotel
November 14, 1990	9:00 a.m.	Tampa, Florida	Omni Hotel at Westshore

Literature Cited

Klima, E. F., J. M. Nance, E. Martinez, and T. Leary - 1990. Workshop on Definition of Shrimp Overfishing, July 26-27, 1990. NOAA Technical Memorandum NMFS-SEFC-264, 21 p.

Nance, J. M. 1989, Stock assessment for brown, white and pink shrimp in the U.S. Gulf of Mexico, 1960-1987. NOAA Tech. Memo. NMFS-SEFC-221, 65 p.

Nance, J. M. and E. F. Klima, 1989. Triggering Mechanism for Opening of the Federal Waters off the State of Texas. NMFS-SEFC, 14 p.

Nance, J. M., E. F. Klima and T. E. Czaplá. 1989. Gulf of Mexico Shrimp Stock Assessment Workshop. NOAA Tech. Memo. NMFS-SEFC-239, 41 p.

Ricker, W. E., 1975. Handbook of Computations for Biological Statistics of Fish Populations. Bulletin of the Fisheries Research Board of Canada 119: 1-300.

Figure 1. Rock Shrimp Landings

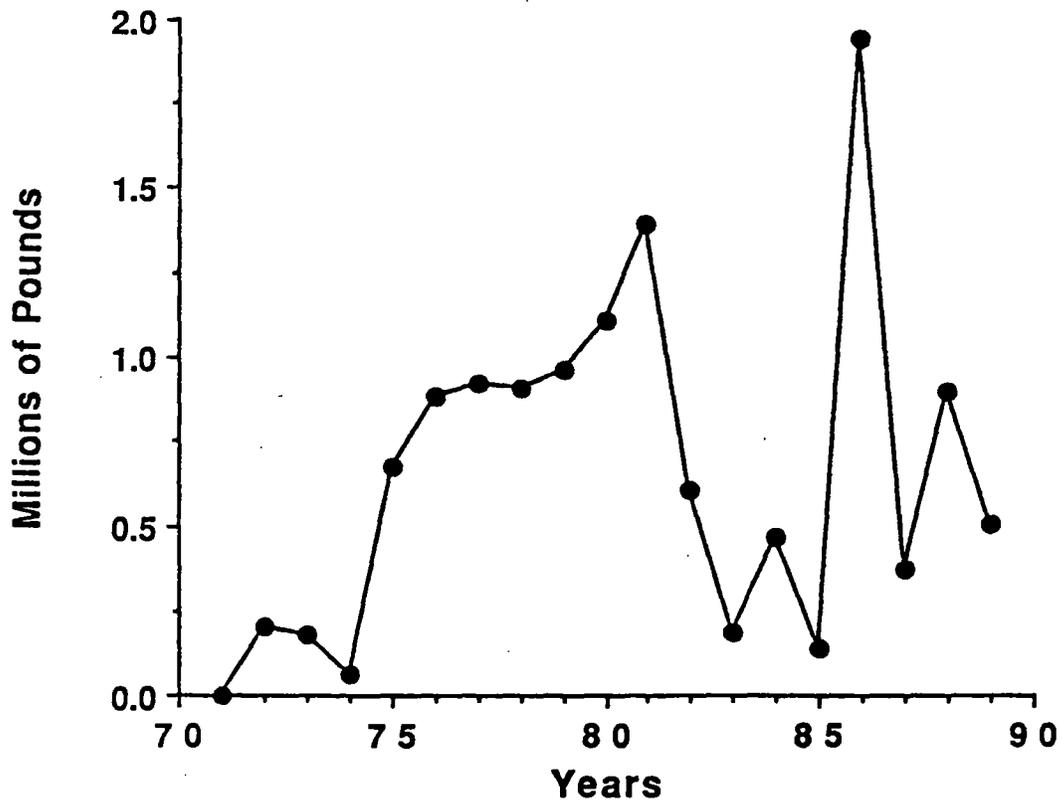


Figure 2. Seabob Shrimp Landings

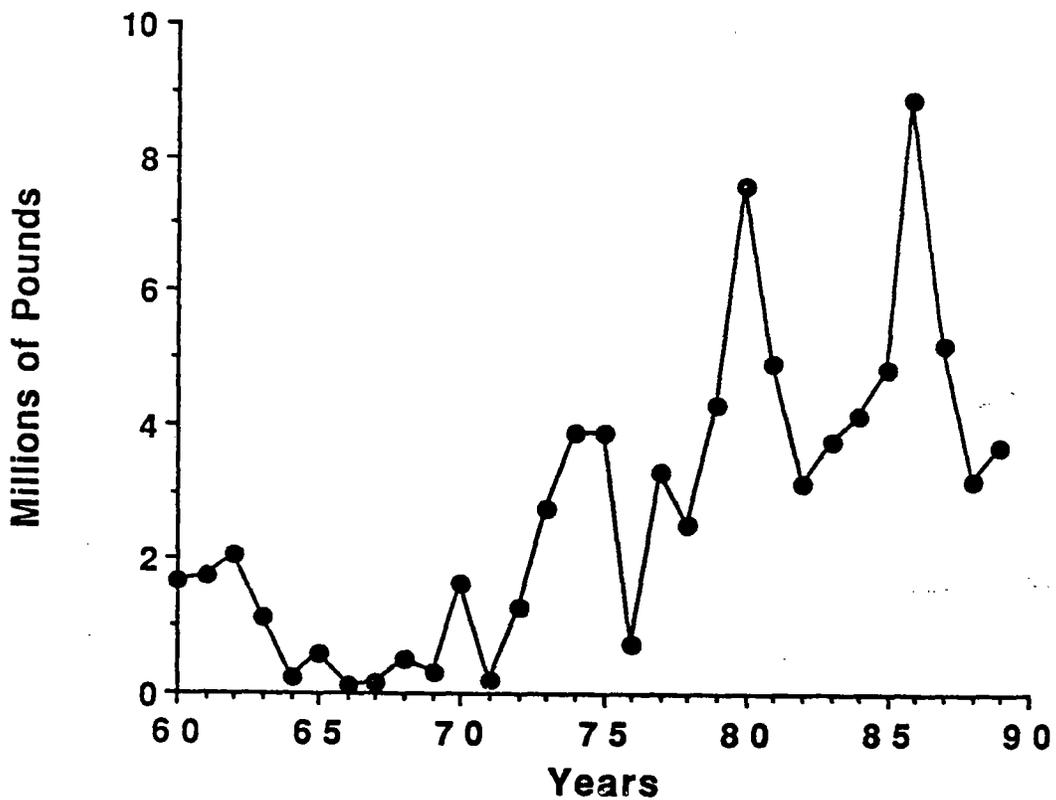


Figure 3. Brown Shrimp Parents (age 7+ months, November-February)

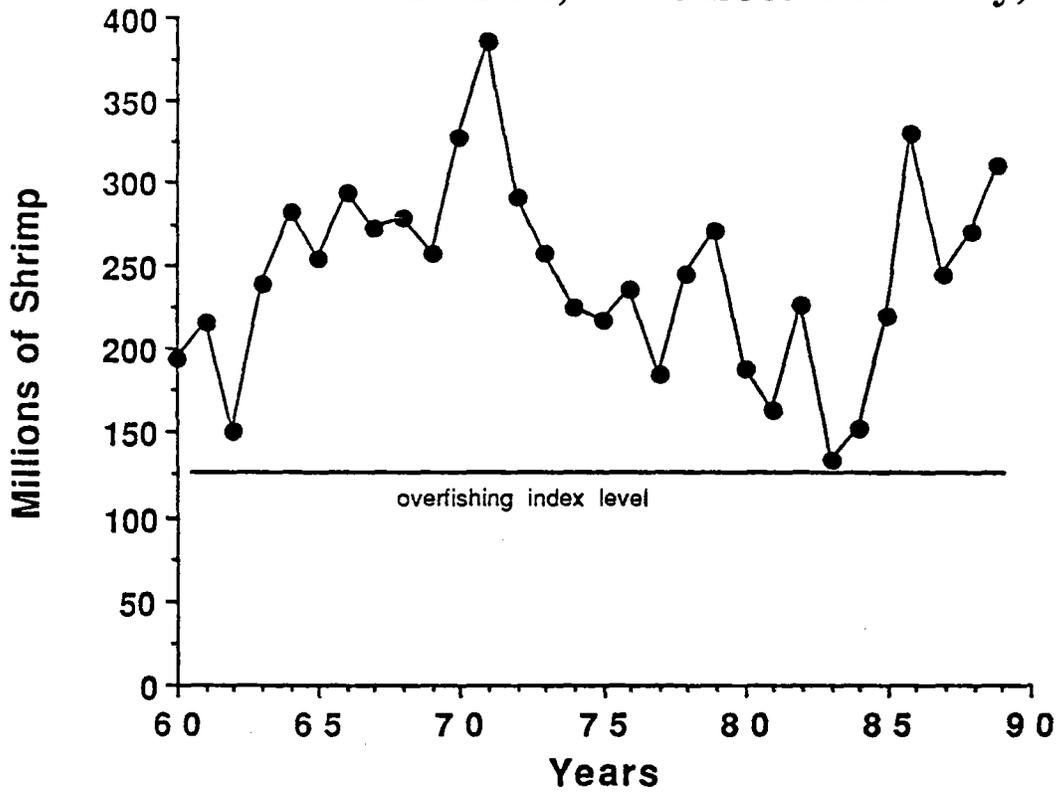


Figure 4. Brown Shrimp Landings

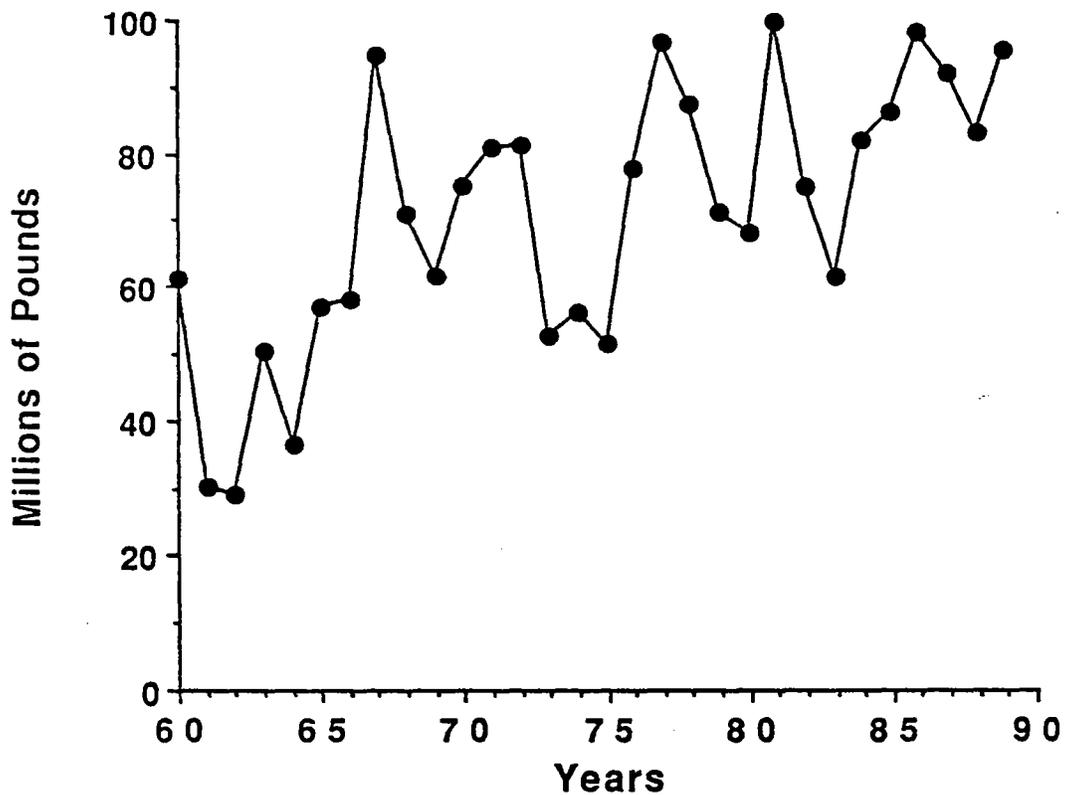


Figure 5. Brown Shrimp Directed Nominal Fishing Effort

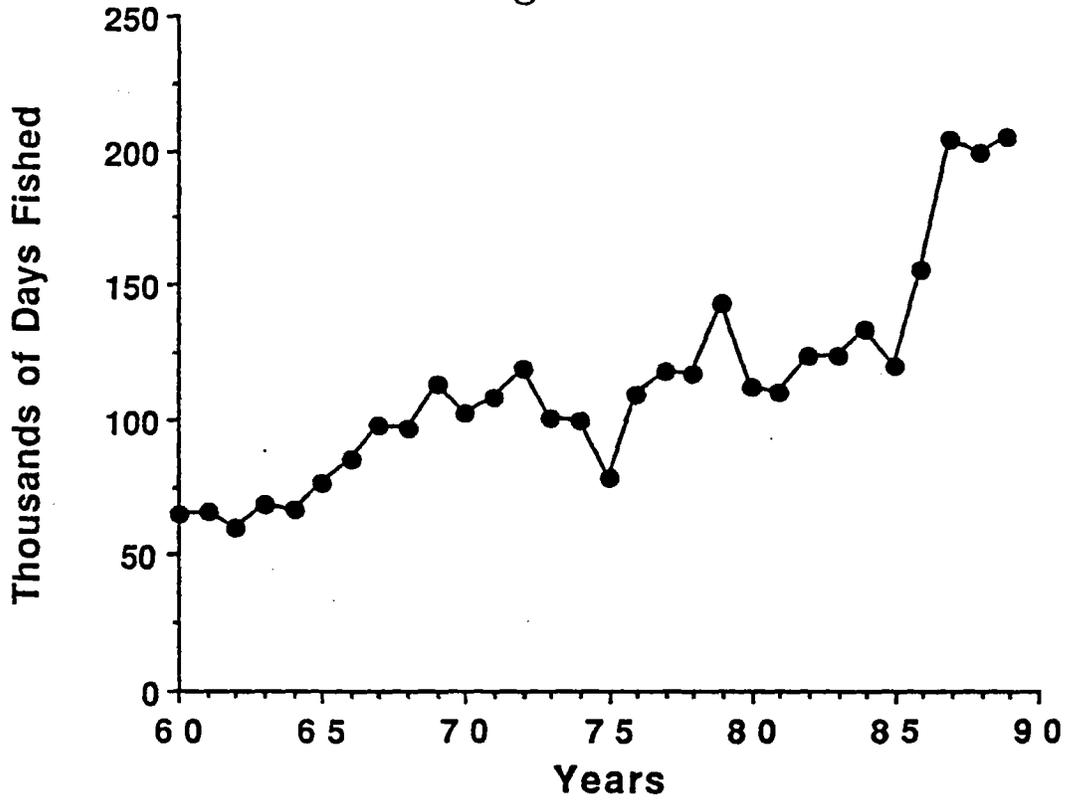


Figure 6. Brown Shrimp Recruitment

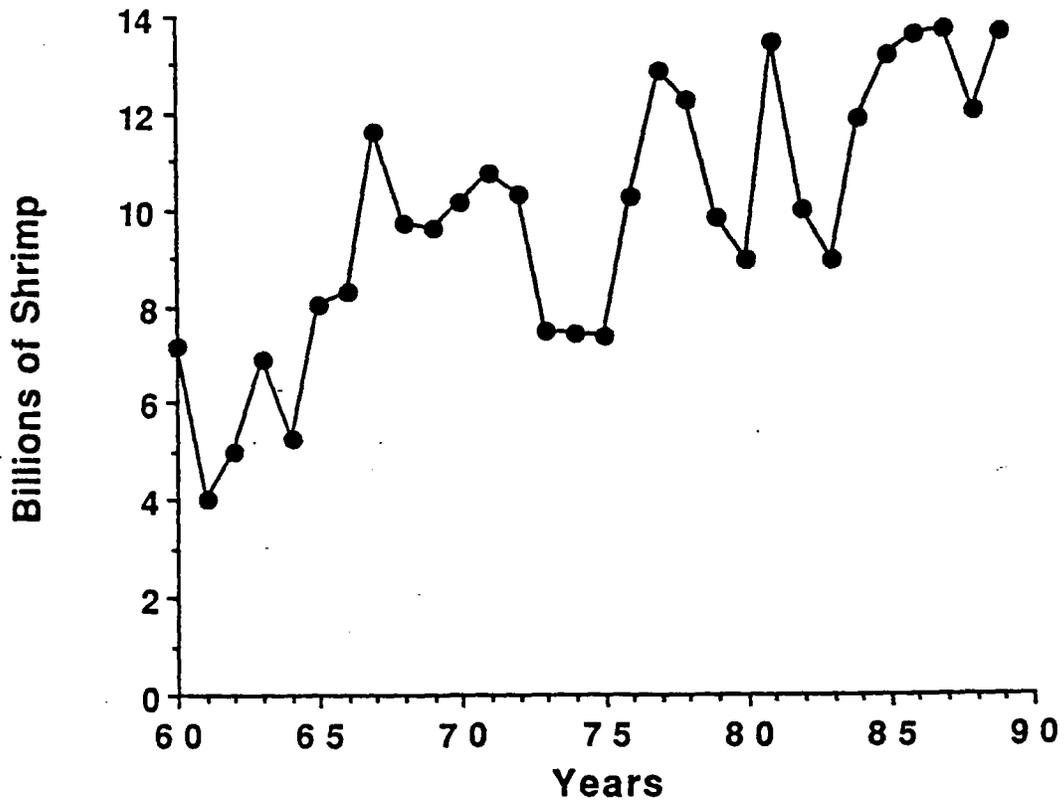


Figure 7. White Shrimp Parents (Age 5+ months, April-August)

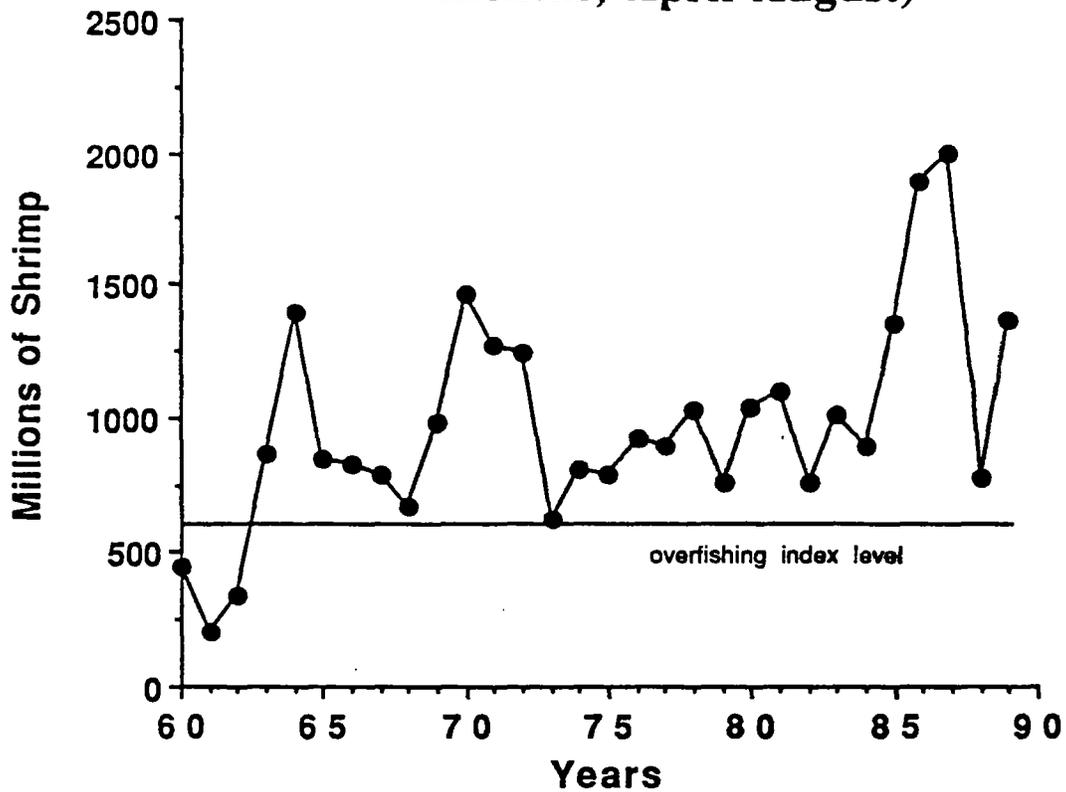


Figure 8. White Shrimp Parent Stock - Recruitment Relationship

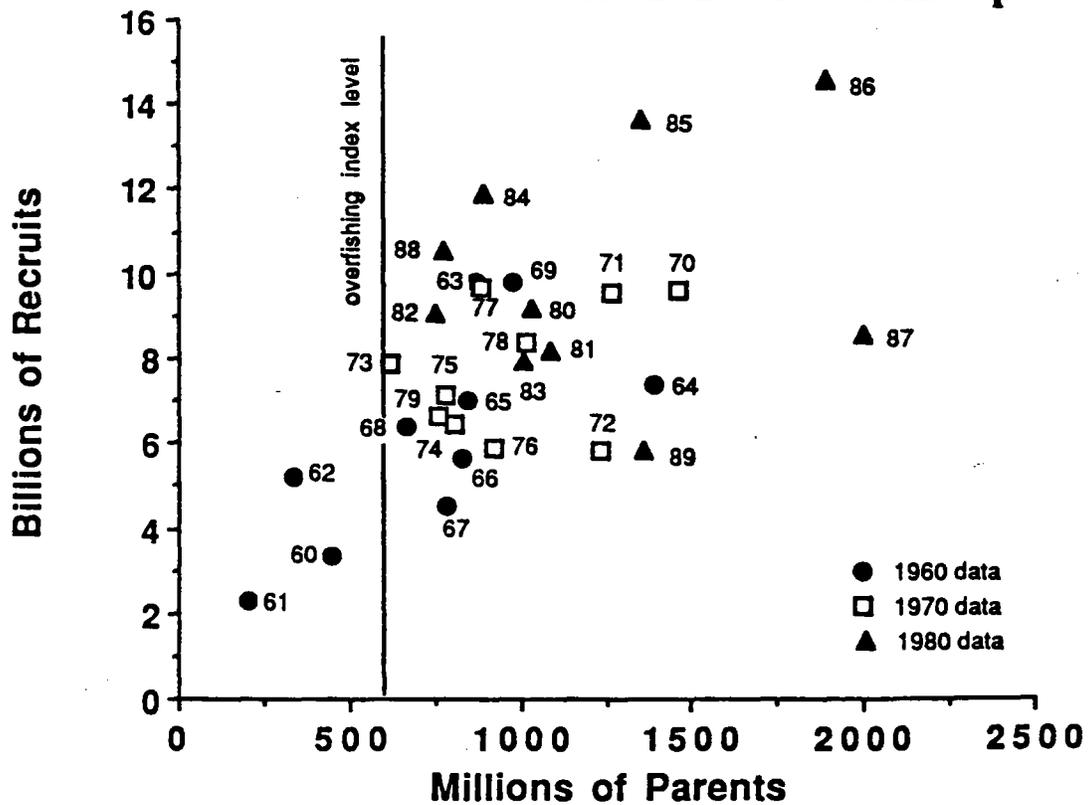


Figure 9. White Shrimp Directed Nominal Fishing Effort

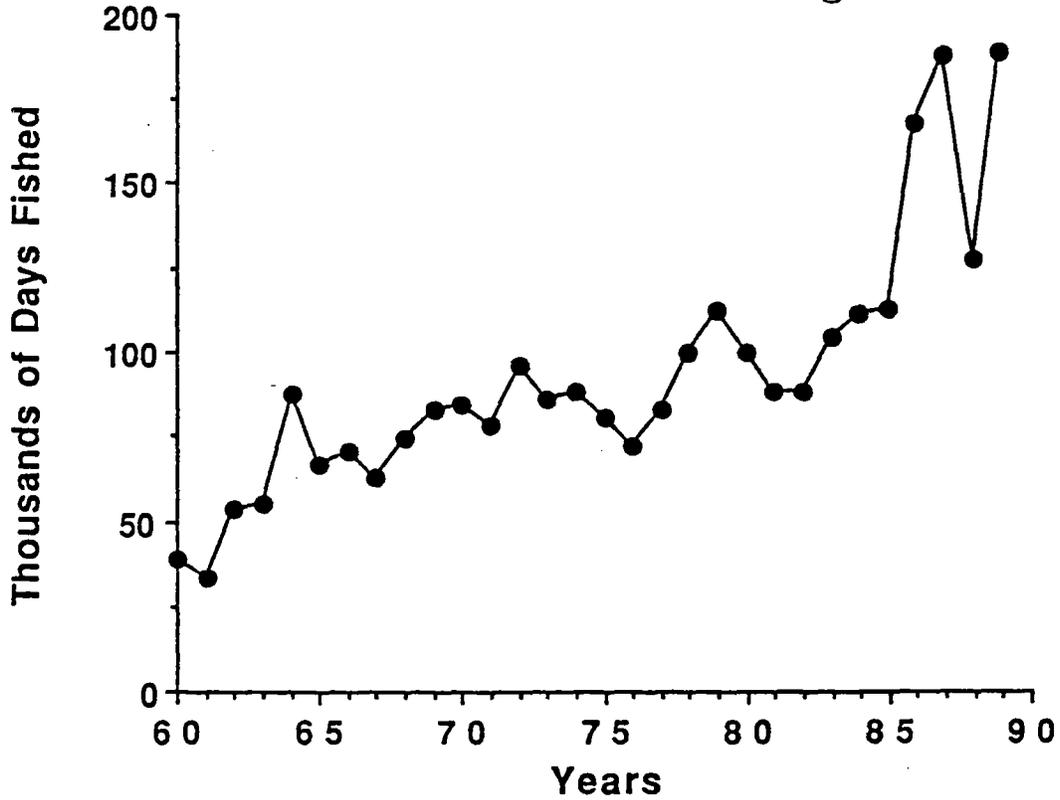


Figure 10. White Shrimp Recruitment

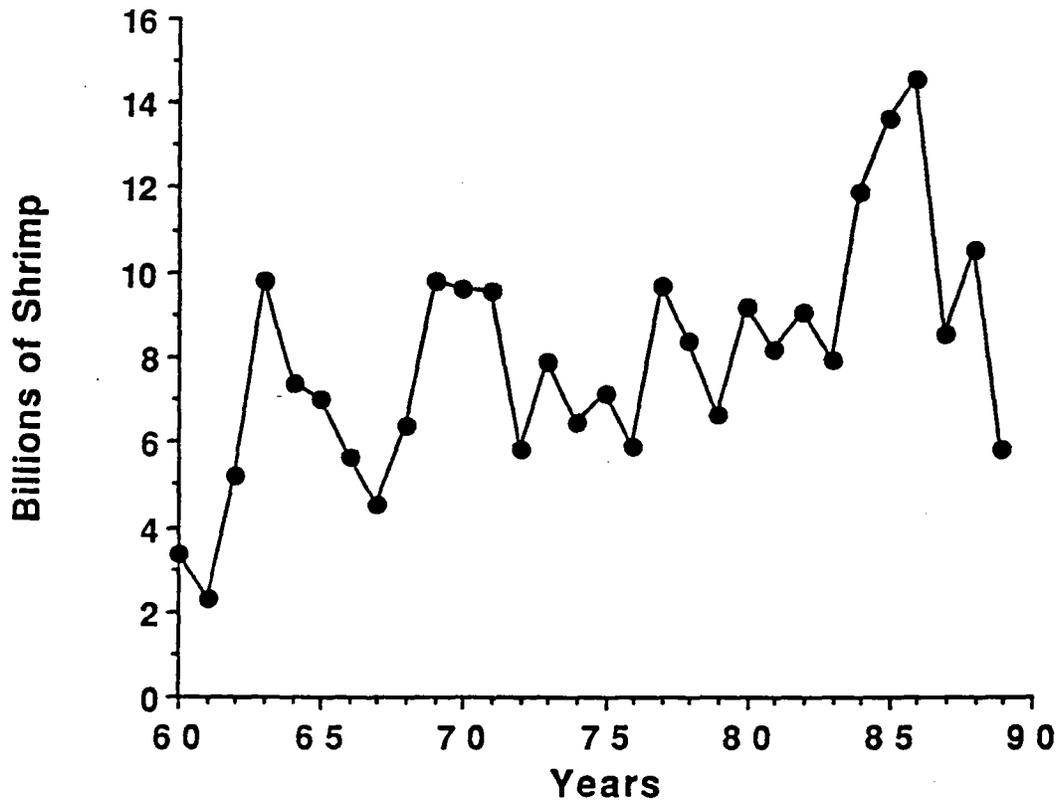


Figure 11. White Shrimp Landings

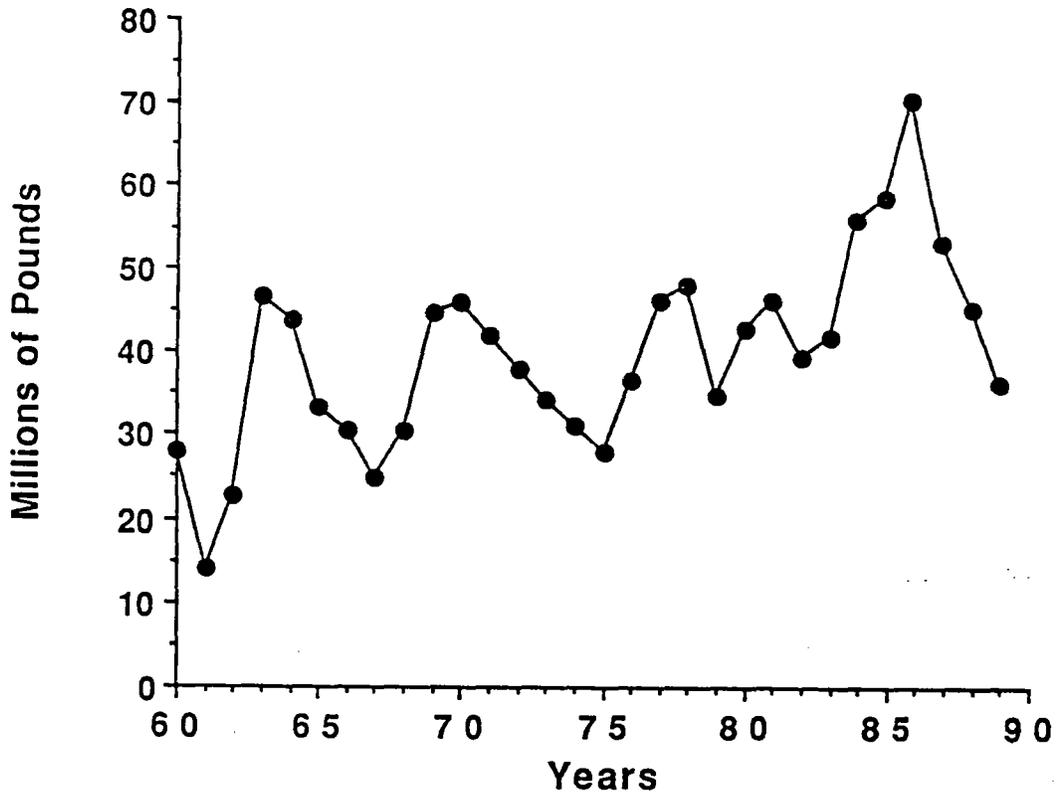


Figure 12. Pink Shrimp Parents (Age 5+ months, July-June)

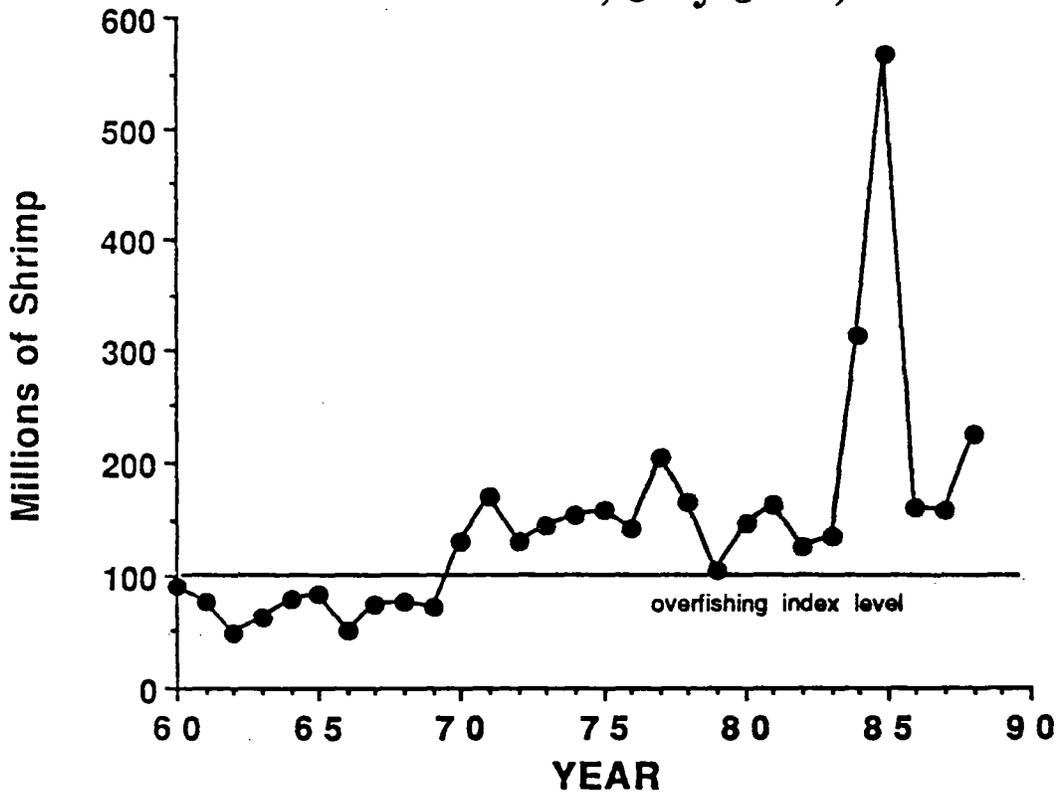


Figure 13. Pink Shrimp Landings

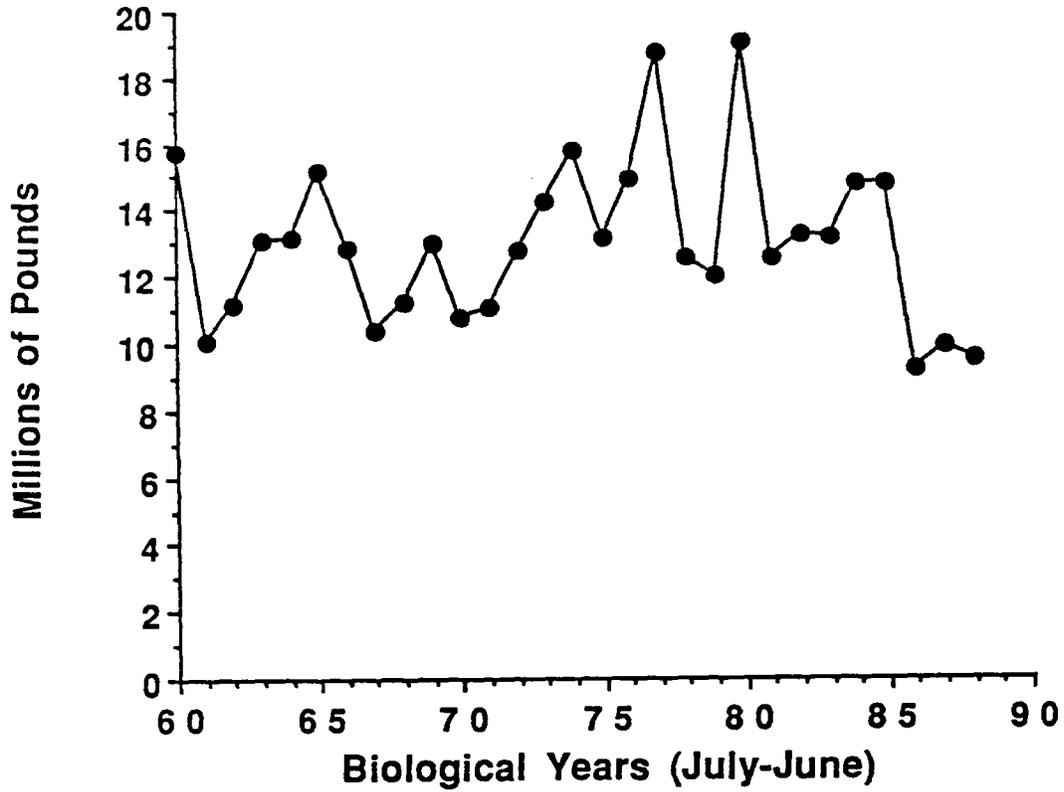


Figure 14. Pink Shrimp Recruitment

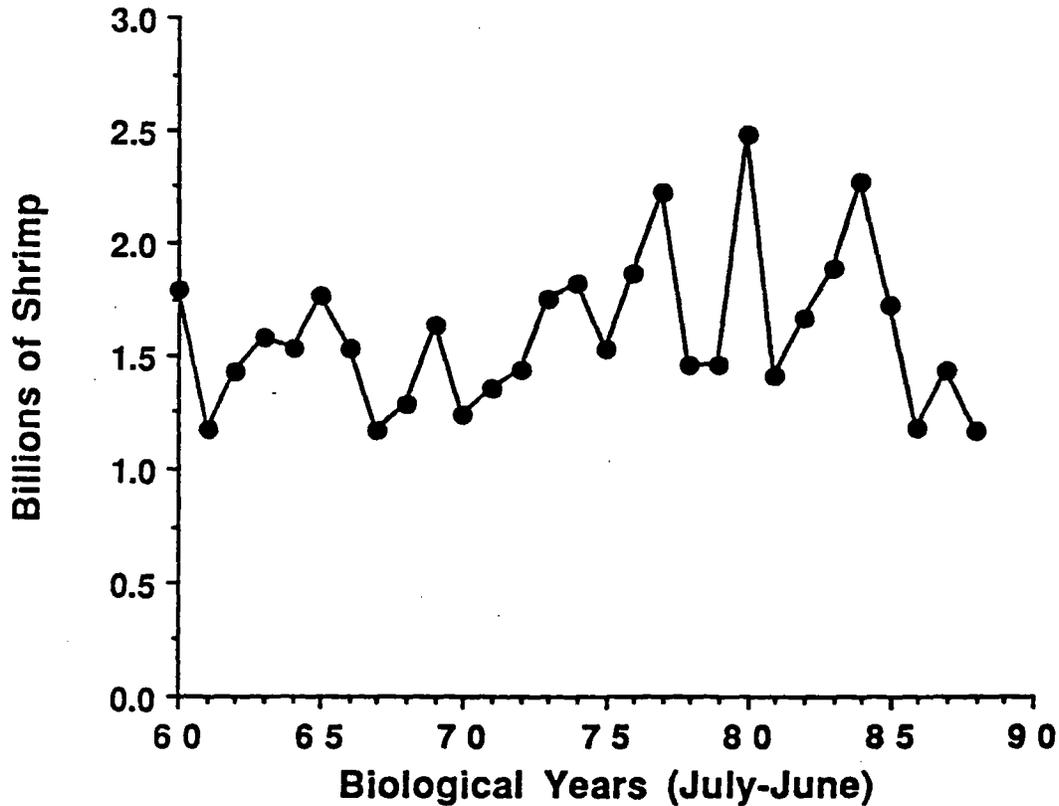


Figure 15. Pink Shrimp Directed Nominal Fishing Effort

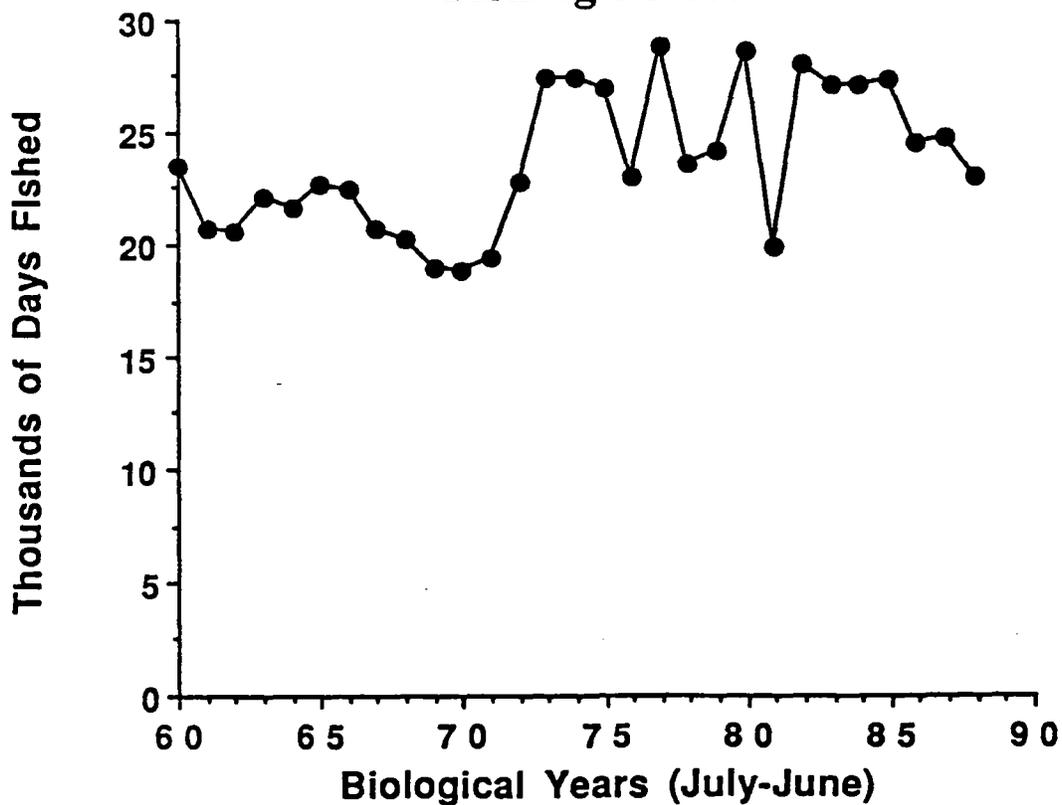


Figure 16. Pink Shrimp Catch per Day

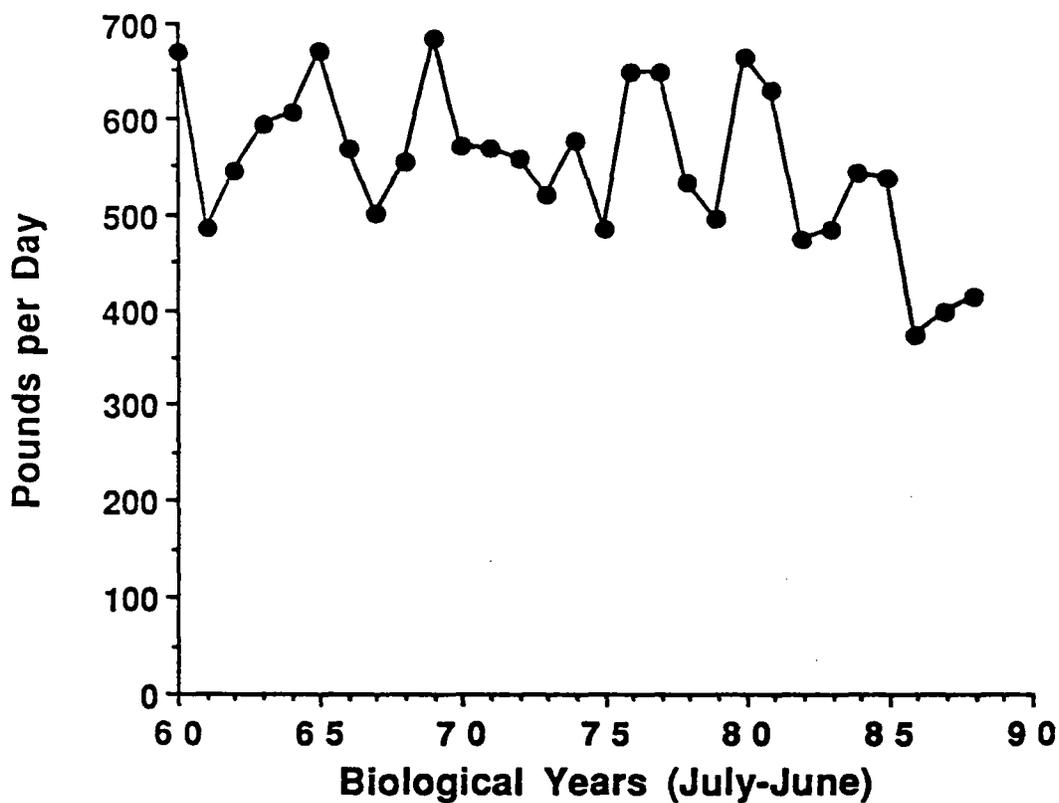
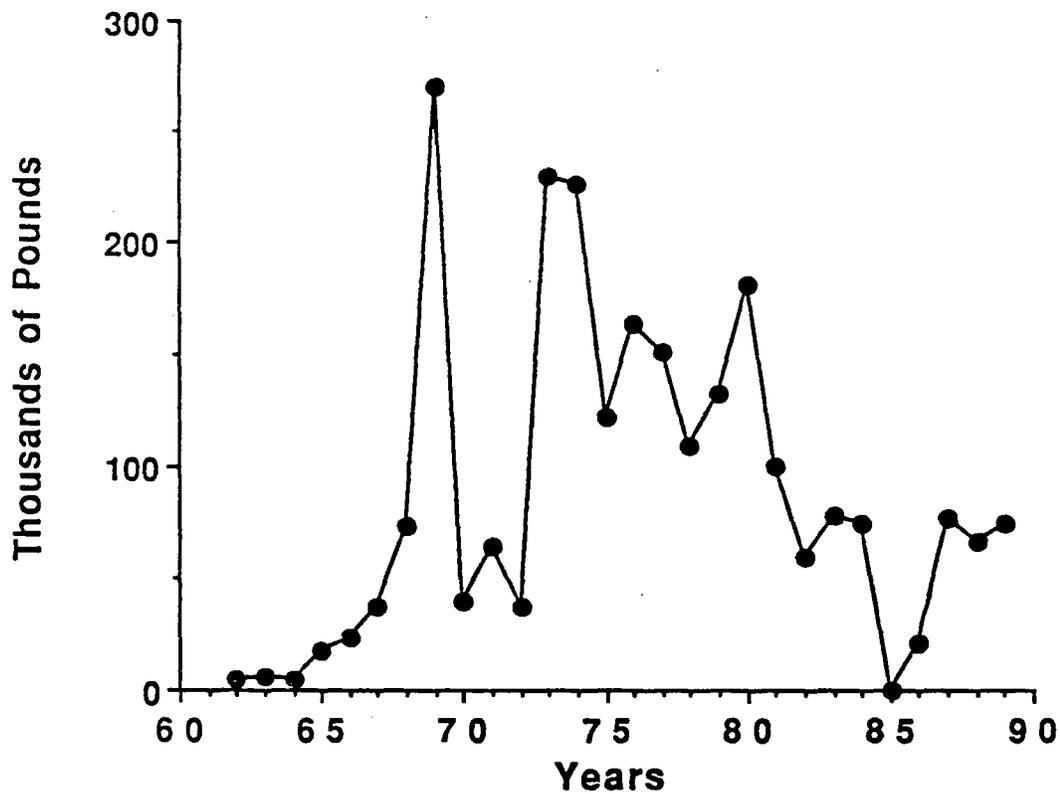


Figure 17. Royal Red Shrimp Landings



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