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FINAL REPORT

Grantee: Harold A. Loftes, Jr.

Project No: 94-FIG-101 067

Grant No: NA56FK0101

Project Title: "Shrimp Fishing by Trawling, 100-700 Fathoms"

Period Covered: March 29, 1995 - July 31, 1997

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Approved by: Harold Loftes, Jr.

Date: November 17, 1997

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Final Report

Shrimp Fishing by Trawling, 100 - 700 Fathoms

Fishing Industry Grant No. NA56FK0101

Identifying Number 5FM 1400/8L3B6R5R/4111

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Acknowledgements

The funding for the project was through a Fishing Industry Grant (FIG) administered by the U.S. Department of Commerce, NOAA, National Marine Fisheries Service Saltonstall-Kennedy Program. The FIG appropriation came at a critical time for the fishing industry and was intended to provide possible alternatives to the traditional groundfish fishery that was facing restrictive fishery management controls upon the implementation of Amendment 5 to the Groundfish Fishery Management Plan. The FIG awards were a significant act of recognition by the federal government of the potential economic decline upon implementation of the FMP.

Design and construction of the hydraulic winch system was accomplished by Rhode Island Engine Company. Jay Gallup was the principal participant in the project. Nets, tow wire, and groundgear was supplied by Trawlworks, Narragansett, RI. The principal participant was Robert Taber.

The Fishscope and GPS was supplied by Chris Electronics, New Bedford, MA. The principal participant was Bob Dixon.

The Electronic Plotter and Software was supplied by Point Judith Electronic Service Corp. of Narragansett, RI. The principal participant was Barry Barrett.

I. Executive Summary

The final report for the Fishing Industry Grant entitled, "Shrimp Fishing by Trawling, 100 - 700 Fathoms" includes the detailed phases of the grant from the design and installation of the winch system, the exploration for Royal Red Shrimp, and the sale of the product. The report is written with the purpose of informing potential harvesters in the region that was explored of the problems encountered and how those problems were resolved.

Included in the Appendix of the final report are the actual handwritten bridge logs, and the trip purchase/price slips. There is a brief description of each trip included in the Findings section. A major part of this report focuses on the design, construction, installation and performance of the Hydraulic Winch System.

The conclusions reached by Captain Loftes, the Grant Recipient, are: That the winch system developed over the course of the grant was fully capable of performing in deep water; the electronics purchased to support the exploratory phase of the grant were necessary for navigation; and that Royal Red Shrimp can be landed as a fresh product. There are certain relatively narrow locations where the shrimp can be caught in limited commercial quantities.

Overall, the project can be judged as a success because the primary goals were achieved. The viability of a full scale commercial fishery on Royal Red Shrimp is undetermined in that exploration, in addition to the work done within this and other deep water fisheries grants, is considered to be incomplete in that the disposition of the shrimp within the total area from Cape Hatteras to the Canadian Boundary Line at all times of the year is not known.

II. Introduction

The traditional New England and Mid-Atlantic fisheries have been classified as overfished with few exceptions. Management measures required to prevent overfishing and allow rebuilding to occur are necessarily very restrictive. The time frame for rebuilding is designated to be ten years or less for some species. Fishermen are faced with the fact that the regulations will not be significantly eased within the next ten years.

Economic survival required that fishermen give early consideration to targeting underutilized species or to exploring the possibilities of new resources found deeper than the historical fisheries. Over the past twenty years, there had been enough deep water trawling out to 350 fathoms between the Canadian Boundary and Cape Hatteras to give an indication of the presence of certain species. These included Lobster, Red Crab, Monkfish, White Hake, Deep Water Whiting, and Shrimp identified as Royal Red (*Pleoticus robustus*). The catches of shrimp were

incidental to the "deep water" Whiting fishery, which is usually carried out in depths out to 200 fathoms. On occasion, there were tows of shrimp that were significant enough to warrant further exploration. This grant proposal was forwarded with the knowledge that the Royal Red Shrimp were present. The geographical limits of the resource and the potential commercial viability of a directed fishery was not known, therefore warranted further exploration.

The prospect of deep water exploration also opened up an opportunity to identify any other deep water bottom species that might be present within the geographical limits of the project including their commercial potential.

The grant proposal was made with the additional intent of evaluating the condition of sea life within the area of exploration prior to any significant commercial activity especially between 350 and 700 fathoms (the outside limit of the winch design).

III. Purpose

- A. The purpose of this fishing industry grant proposal was to determine the feasibility of developing a deep water fishery principally for shrimp. A significant part of the grant was designated for the design and construction of a hydraulic winch system that would allow a typical New England trawler in the 80-100 foot range to fish on bottom at depths out to 700 - 800 fathoms.

In addition, there was a need to determine the fish finding capability and depth sounding ability of deep water sounding equipment in depths out to 800 fathoms.

The project called for the use of Bathymetric Charts including a position plotter using the charts in order to successfully navigate in the geographic area proposed in the grant.

The target species was Royal Red Shrimp, *Pleoticus robustus*, primarily because of previous knowledge as a by-catch in the deep water Whiting fishery. The ability to fish to depths of 700 - 800 fathoms opened up the possibility of encountering other species in commercial quantities. Shrimp offered the greatest opportunity in that, in general, it had market acceptability, therefore an immediate possibility to supplement vessel earnings with the knowledge that fishing on the traditional species was going to be severely curtailed.

- B. The list of project objectives were:

1. Design, contract for, and construct a winch system capable of hauling and setting out up to 1200 fathoms of tow wire in depths of 800 fathoms.
2. Exploration of the geographical bottom region between the Canadian line and Cape Hatteras between 200 and 800 fathoms.

3. Determine the electronic equipment requirements essential to operate within the target area.
4. Determine the location of concentrations of Royal Red Shrimp, within the target area.
5. Identify alternative species that occur in possible commercial quantities within the target area.
6. Determine the level of by-catch associated with fishing with shrimp gear within the target area (the smallest twine in the nets used was 2½" mesh measured knot to knot.)
7. Based on the by-catch level encountered, determining the effectiveness of using a Nordmore grate.
8. Provide detailed trip reports indicating the specific findings and locations of the tows made over the period of the project.
9. Determine the characteristics of the Royal Red Shrimp as to size, percent of damaged product, shelf life, fresh iced storage preference, head on or head off for shelf life, and the use of preservatives for maintaining a quality product.
10. Marketing of the product when landed fresh at dockside.
11. Feasibility of shrimp trawling within the target area as a viable commercial operation.
12. Preparation of a report within the requirements of the grant. Insure that the final report presents the information in a format that will be consistent with a commercial appraisal as to the viability of the Royal Red Shrimp resource.

IV. Approach

- A. In the summer of 1994, Captain Loftes, the grant recipient, had the opportunity to spend the better part of a day discussing the problems encountered fishing in deep water with Richard Mounsey, a senior gear technologist from Australia. The discussion included gear, water depths, and most other aspects relating to their Orange Roughy fishery. Mr. Mounsey gave his opinion that the horsepower of Captain Loftes' vessel, Mary Elena, was adequate to fish in at least 500 fathoms. That advice convinced Captain Loftes to proceed with the submission of this proposal.



In September of 1995, James McCauley who assisted Captain Loftes in the preparation of this and other reports throughout the period of the grant, visited the Port of Nelson, New Zealand. During the stay, there were opportunities to discuss the deep water fishery and an opportunity to observe firsthand, the type of fishing gear, deck gear, and electronics developed to meet the needs of the fishery. This information was made available to Captain Loftes prior to receiving the grant.

Captain Loftes had fished in the deep water Monkfish and Whiting fisheries with the F/V Mary Elena and realized that the capability of the vessel was limited to fish no deeper than 200 - 225 fathoms with its existing winches.

In order to generate a grant proposal, Captain Loftes conferred with Jay Gallup of Rhode Island Engine Company of Narragansett, RI on the proposed specifications of a pair of trawl winches and the hydraulic power package. Winches of that size and power had not been specifically constructed for deep water on the East Coast. Inquiries of European manufacturers confirmed that equipment was available but was considered cost prohibitive (low pressure hydraulic systems).

The initial bid proposal from Rhode Island Engine Company was \$82,000 to design, build, and install the high capacity winches (two radial piston hydraulic motors per winch, 2 speed, winch capacity of 1200 fathoms of 11/16" wire, later revised to 1200 fathoms of 3/4" wire). Quotations for nets, trawl doors and tow wire from Trawlworks, Inc. of Narragansett and a quote for a Kodak Chromoscope was also included in the grant application.

The grant was approved on March 29, 1995. Rhode Island Engine and Trawlworks were informed of the timetable for the project and the equipment was ordered.

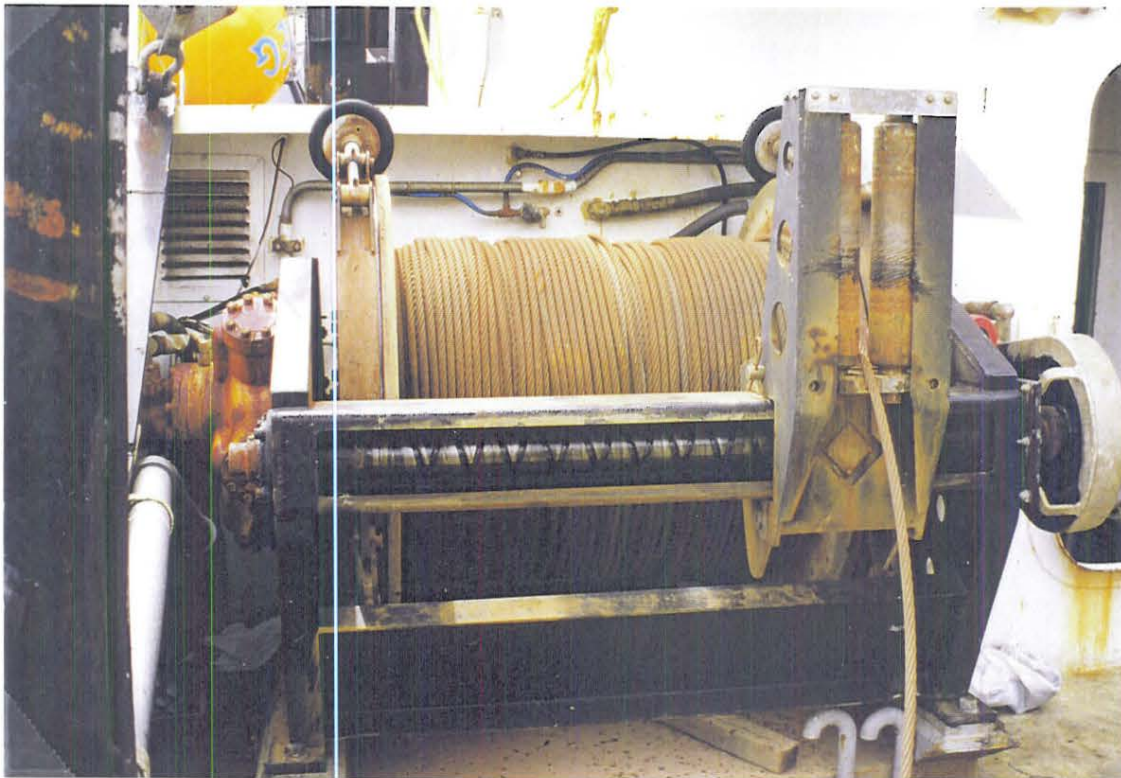
The target date for completion of the winches was mid-July of 1995. The Mary Elena was tied up on June 15th. The original winches were removed. The new winches were obviously larger than those that were removed. Using a template provided by Rhode Island Engine, heavy base plates were cut and welded to the deck. The vessel's forecastle bulkhead was modified to accommodate the winches. The work was accomplished by Captain Loftes and his son Kevin. The date was mid-July and since the winches were not completed, the Mary Elena was taken to Fairhaven, MA, hauled out, and a new transducer for the color fishscope was installed.

The winches were not ready for installation until September 1st. In part, the delay was caused by the construction of a similar pair of winches for installation aboard the Connecticut-based F/V Matthew & Melissa owned by Walter Alleyn, also a grant recipient for deep water exploration.

When the winches were installed, the overall width was 6 inches more than planned. The cap rail of the vessel was cut out and the winches were repositioned. The installation of the winch system was completed at the end of September. During sea trials, it was found that the level winds on the winches did not work properly. Rhode Island Engine analyzed the problem and ordered replacement level wind screws supplied by a Texas-based company.

At that point, the vessel had been out of service for 108 days. When the vessel returned to fishing, operations were restricted to relatively shoal water. With the level winds inoperable, it was impossible to guide the trawl wire manually.

The new level wind screws were installed in four days after Christmas. Overall, the modifications to the vessel hydraulic systems, cost of materials, and cost overruns came to \$44,000 which was the responsibility of the vessel owner.



Portside Winch. Drive chain for the level wind screw is inboard (right side of photograph), two radial piston motors, and dual air brakes. The specifications for the F/V Mary Elena winches are included in Appendix II.

The deep water exploration did not begin until March 4, 1995. In the interim period the vessel was engaged in the Squid fishery. On February 22, 1996 while Squid fishing, a fish was caught, later identified by Dr. Donald Fletcher of Woods Hole as a "Big Roughy", weighing 3 lbs. and measuring 15 ½" in length.

The deep water exploration commenced with the vessel rigged with 1200 fathoms of tow wire, Thyburon Type 7 trawl doors (92" long, weighing 1740 lbs.), 20 fathoms legs and 20 fathoms ground cable, a 2 ½" nylon box style net with a 151 foot head rope and 163 foot sweep. The footrope of the net was 8" and 10" Rock-hopper style, 84-8" floats, and a 1 ½" (knot-knot measurement) liner inside a 5 ½" double braid codend. A 3/8" tickler chain was attached from wing end to wing end.



Mouth of the 2 ½" Shrimp Net. Details of the net construction in Appendix III.

Prior to commencing deep water operations, Captain Loftes acquired a full range of NOAA Bathymetric Charts. Standard charts do not provide the necessary detail to tow where drastic depth changes occur.

After considerable research and discussion, Captain Loftes purchased a Honda HE 737 Color Sounder with multiple frequencies (28, 55, and 100 kHz).

Trip #1:

The first day of actual fishing in deep water took place on March 4, 1996 in the Baltimore Canyon area (see trip logs in Appendix IV for detail). Three tows were made resulting in a catch of 75 lbs. of Big Roughy and a few Scup and Squid. Experienced a bad tear-up between 100-200 fathoms in the mouth of the Canyon. The belly and most of a wing of the net was lost. The few fish caught were unloaded in Cape May, New Jersey. Poor prices for the Roughy, since there was no dockside experience selling or even identifying the species.

In the process of exploring the deep water during this first trip, there was excessive heat generated in the hydraulic system. There was a concern that the gear might not be recovered with close to 1200 fathoms of wire overboard. To overcome the problem, the idea of incorporating an oil cooler was considered. It was later determined that the cause of the heat was the bypassing occurring in the relief valves. The settings on the relief valves were matched to the power of the GM 6-71 hauling engine, developing 220 hp at 2100 rpm. With higher pressure relieve valve settings, the engine did not have the power to haul the gear. Captain Loftes made the decision to replace the hauling engine with a rebuilt 892 Detroit-rated 400 hp at 2100 rpm. The change was carried out after Trip #2. Because of modifications in the engine room and the exhaust system, the project took 30 days. With the new engine, hydraulic pressure could be increased to the maximum rating of the hydraulic system (4000 psi). The cost of the project was not included in the grant as a reimbursement.

The need to increase the horsepower of the hydraulic system was determined to be the weight of the tow wire in addition to that of the doors, groundcable and net, using a 1½:1 ratio, length of tow wire: depth. During normal fishing practice in shoal water, most of the wire is on the drum before the doors clear bottom using a 3 or 4:1 ratio.

Trip #2:

Trip #2 was one day of five tows between March 15th and 16th. The area fished was southwest of Baltimore Canyon. All tows were made with a Rock-hopper net with a 16cm face graduated to 9cm with a 1½" liner.

Two tows in 100-200 fathoms had a "net full" of Dogfish. One tow, between 225-325 fathoms, had 100 Black Dogfish, 100 Hake, 300 Monkfish, 250 Red Crabs, 15 Scarlet Shrimp and 90 Lobsters. One tow between 400-800 fathoms had 50 Black Dogfish, 25 Hake, 3 Greenland Halibut, 10 Grenadier, 5 Scarlet Shrimp and 60 Lobsters. During the day, an attempt was made to tow over a "sea mount". No Roughy were caught during the 5 tows.

There were a number of species caught during this trip that Captain Loftes considered unusual. They were sent to Nancy Balcom of the Connecticut Sea Grant Marine Advisory Program, University of Connecticut, for identification. Photographs of the catch are included in Appendix V.

As mentioned previously, between the period March 17 and Trip #3 on June 16, 1996, the new hauling engine was installed and the vessel was employed in traditional fisheries. With the time lost to modifications to the winch and the initial lay-up for installation, Captain Loftes had no alternative other than improving the financial situation of the vessel and crew.

During this period it became obvious that the purpose of the grant could not be realized within the initial time line which was scheduled for completion by July 31, 1996. A request to extend the period of the grant another year to July 31, 1997 was submitted on June 21, 1996 and subsequently approved by the Grants Operation Branch of NMFS.

The Clinton Fisheries Grant, William Bomster and the Matthew and Melissa, Walter Allyn's Grant, had either been concluded or was nearing completion. Captain Bomster had not located shrimp deeper than 250 fathoms. Based on the information accumulated to date, Captain Loftes was able to concentrate his efforts in geographical areas that had not been explored or more completely define those areas where Royal Red Shrimp had been found.

Fishing in depths less than 200 fathoms west of Hudson Canyon during the period beginning the end of October and ending June was a violation of the "Gentlemen's Agreement" existing between fixed and mobile gear fishermen. The "Agreement" was later made a regulation through framework adjustments to the Lobster, Scallop, and Multi-Species Fishery Management Plans in the Spring of 1997. These regulations were an important consideration during the balance of the operational opportunities of this grant.

Trip #3:

Trip #3 consisted of two days of fishing on June 19th and 20th, 1996. Ten tows were made between 190 and 460 fathoms. No commercial quantities of shrimp or fish were caught. The trip resulted in a total of 32 lbs. of Royal Red Shrimp. The shrimp were sold fresh to the Point Judith Fishermen's Co. (PJFC) in Narragansett, Rhode Island. The average price to the boat was \$3.25 heads on. Note: The landing ticket/price sheet for Trips #3 through 15, with the exception of Trip #9, can be found in Appendix V.

Trip #4:

Trip #4 covered three days of fishing between June 28th and July 1st, 1996. Fourteen tows were made from the south edge of Wilmington Canyon to Washington Canyon. Vessels fishing from the port of Cape May, New Jersey had caught shrimp, on occasion, in the area. Hang-ups were common throughout the trip caused primarily by rocks with some loss of twine. The catch for the period was 600 lbs. and was sold at the PJFC for a straight price of \$3.00/lb. The trip concluded by fishing for Illex Squid from July 2nd to the 5th. This additional time was not charged to the grant.

Trip #5:

Trip #5 covered the period July 19th through the 23rd. Twenty-two tows averaging 3-4 hours were made over the five days. The trip was made between the west side of Hudson Canyon East to the west side of Atlantis Canyon in depths ranging from 180 - 300 fathoms. The best fishing was between Block and Atlantis

Canyons. Long line vessel operations were being carried out in the area, typical of the time of year, and were a constant problem. The Nordmore grate was tried during two tows during the trip. The grate was found to plug up with ghost lobster gear, rope and a type of straw-like organism common to the area. There were some discards in the tows including Monkfish, Red Crab, and Whiting. The Whiting price was low and not considered worth saving. The catch for the period was 3270 lbs. of Royal Red Shrimp.



Typical Ghost Lobster Gear caught during deepwater tows. Gear usually had to be cut out of the net.

Trip #6:

Trip #6 covered the period July 29th through August 1st, 1996. Eleven tows were made during the three-day trip in the same general area as Trip #5. Significant to this trip was that during eight tows between 175 and 195 fathoms, the catch averaged 325 lbs. Towing time for all tows was between three and four hours. Tow 9 was in 150-158 fathoms for 20 lbs. Tow 10 was in 250-260 fathoms for 10 lbs. The wing was torn out from ghost lobster gear. Tow 11 was in 265 fathoms, hung up, and parted the tickler chain, and lost 1st and 2nd belly sections of the net. The crew mended all the way back to the dock, approximately 10 hours. The catch for the trip was 2430 lbs. at an average price of \$2.45/lb.

Trip #7:

Trip #7 took place between August 18th and 20th, 1996. Twelve tows averaging 3 hours and 45 minutes were made with an average catch of 200 lbs. Catch for the trip was 2610 lbs. Two tear-ups occurred, one from aircraft wreckage.

Trip #8:

Trip #8, August 23-25, 1996, consisted of nine tows between 170 and 195 fathoms in the same general area as the previous three trips. The catch was 1065 lbs. of shrimp.



Close Up View of a Tow of Royal Red Shrimp Prior to Being Culled.

Trip #9:

Trip #9 took place between the west side of Hudson Canyon, south to Baltimore Canyon. The trip was made using a 6" face net with graduated mesh bellies down to a 1½" liner in the codend and a Rock-Hopper sweep. Extensive gear damage and twine loss occurred. Radical depths were common, especially in the area of the canyons. Two tows were made over three sea mounts on the west side of Wilmington Canyon. Only 2 Shrimp, 50 Monkfish, 50 Whiting, and 100 Red Crabs were caught in the area. Only 9 lbs. of Shrimp were caught for the trip. This was the last trip for 1996.

Towing in the Canyon areas was found to be very difficult. The bottom contours and the steep angles of the bank required that the vessel operator know his exact position on the Bathymetric Chart at all times in order to anticipate the next turn. The same held true when determining the direction to set the gear in order to begin towing in the desired depth. Captain Loftes arranged to try a GPS and a Shipmate Plotter with Bathymetric Charts. During the winter and spring of 1997, the GPS worked well but no Bathymetric Charts were delivered for the Shipmate Plotter. The Shipmate was replaced with a new P-Sea Plotter with Wind Plot Software which had Bathymetric Charts. Additional Bathymetric Charts for the area south of Cape Hatteras were installed by June 1st, 1997.

The first trip in 1997 did not begin until June. The vessel was engaged in traditional fisheries during the interim period between trips #9 and #10.

Trip #10:

Trip #10 took place between June 10th and 19th, 1997. Tows were made starting on the west side of Hudson Canyon, south to Cape Hatteras. Captain Loftes discovered that the latest Bathymetric Charts for the Cape Hatteras areas could not be accessed in the computer. This turned out to be a severe handicap. Three nets were torn up with substantial loss of twine. Due to the damage and being unable to adequately navigate in the area, the southern leg of the trip was called off. Only 5 lbs. of shrimp were caught.

The trip resumed in the Block Canyon area after the gear area closure opened on June 16th. Thirteen tows were made with an average catch of 275 lbs./tow. The tow time average was 3:30 hours. The catch was 3600 lbs. of Shrimp. There was \$2062 worth of lost twine, etc. from the tear-ups.

Trip #11:

Trip #11 took place between June 22nd and 25th for 3½ days. Twelve tows were made in 180 fathoms in the Block Canyon area. The catch was 1320 lbs.



A representative tow in the Block Canyon area. Catches were 200-300 lbs. for a 3½ hour tow.

Trip #12:

Trip #12 was for 4½ days between June 27th and July 2nd. Sixteen tows were made in 190-200 fathoms. The catch was 1365 lbs.

Trip #13:

Trip #13 was for 3½ days between July 5-9, again in the Block Canyon area. Fourteen tows resulted in a catch of 2150 lbs.

Trip #14:

Trip #14 was for 3½ days between July 12th and 16th. Twelve tows were made in 195-210 fathoms. The catch was 2160 lbs.

Trip #15:

The final trip in the series took place between July 19th to 23rd, 1997. Eleven tows were made in the three-day period for 1480 lbs. The grant period ended on July 31, 1997.

Handling of the Product:

The key to the success of the sale of the Royal Red Shrimp was the detail of attention paid to the care and handling. The shrimp were caught during tows that were of 3½ hours duration. Most of the time, the Shrimp were the bulk of the catch, as seen in the preceding photograph. The 1½" twine in the codend liner protected the Shrimp from damage since they did not protrude from the mesh to any degree and therefore were not subject to excessive mutilation when bringing the codend up the ramp.

Once on deck, the Shrimp was washed from the deck pen into a conveyor sump, then carried up by the conveyor to waist high level for a distance of twelve feet. The conveyor system both washed and drained the water from the Shrimp. Due to the number of Shrimp by count in a tow, 20-35 in a pound, there was a significant amount of hand sorting and grading. The conveyor proved to be a valuable piece of equipment. Washing the catch into the sump limited the number of times each piece was handled which contributed to the quality.



Once sorted, the Shrimp were dipped in Everfresh, a melanosis inhibitor, for the prevention of Shrimp Blackspot. The solution used was 200 grams or 7.05 ounces to 25 gallons of seawater. Fifty-five pounds of Shrimp were dipped at a time for 2-3 minutes. The solution was used for up to 10 dips before being dumped. In any case, a batch of dip was not used after 24 hours. Everfresh is available through Cultor Food Science Incorporated, 205 East 42nd Street, New York, NY.

The Shrimp were slid down a plastic coated cloth chute into standard plastic totes for storage throughout the trip. There were no holes in the totes in order to retain a mix of seawater, 1/3 to 1/2 of a cup of salt, and ice. The Shrimp were stored whole with approximately 50 lbs. to the tote. Using this method, the Shrimp could be landed on the fifth day from the time the first tow came on deck. Temperature of the water in the tote was 28-29°F during the trip because of the salt.

The product was held in totes until ready to be packed for shipping. The product was packed in 15 lb. plastic bags, then two plastic bags in a 50 lb. cardboard shipping box, well iced with flake ice. Packing the product in 15 lb. bags prevented further contact with the ice and prevented the Shrimp from becoming stuck in the ice or to other Shrimp. Although not as effective as the totes with ice water used initially, the shipping pack proved adequate for shipping and storage of up to one or two days if necessary. The pack also allowed the fresh market dealer the opportunity to sell the product in 15 lb. increments.

Most of the Shrimp were sold to the Point Judith Fishermen's Company of Narragansett, Rhode Island, a division of M. Slavin & Sons of New York City and Brooklyn, New York. The boat prices received were \$3.00-\$3.25 for large 20-30 count/pound, and \$2.00-\$2.10 for small 30-up to 40 count, with the heads on. Shrimp were sold heads-off with a yield of 52% and a selling price up to \$4.00/lb. The economics of selling heads-off product caused the focus to be on the heads-on product. The exposure to deterioration of the exposed meat of the heads-off shrimp when sold fresh was the principal cause of the comparatively low price.

During the period of the grant, small samples of fresh Shrimp were distributed to local buyers, but there was little or not interest in the product. Shrimp were also frozen, heads-off, by Deep Sea Fish Company of Narragansett, Rhode Island after the product was landed fresh. The company could not develop interest in this relatively unknown product. Possibly, over time, the product might become competitive with other frozen product. The fact that fresh Shrimp could be landed close to the New York and other East Coast city markets opens up possibilities that are not available to traditional Shrimp harvesters.

The detailed price information from each trip can be found in Appendix V.

- B. The fishing exploratory work was done by Captain Harold A. Loftes, Jr., the Grant Recipient. The vessel crew was usually comprised of four men including Kevin Loftes, the Captain's son, who contributed considerable time in the installation and modification work done during the project. Financial records for the project were managed by Mary Loftes, the Captain's wife. The quarterly reports were prepared by Captain Loftes with the assistance of James A. McCauley, who also prepared the funding requests and the final report.

The marketing of the Shrimp was done by the Point Judith Fishermen's Company of Narragansett, Lawrence Rainey, General Manager, and the parent company, M. Slavin & Sons of New York City, New York.

The design, construction, and modifications to the winches was done by Rhode Island Engine Company of Narragansett, Rhode Island under the supervision of General Manager, Jay Gallup. Captain Loftes consulted with Mr. Gallup in the summer of 1994 on the proposed design of winches capable of hauling and setting up to 1200 fathoms of $\frac{3}{4}$ " trawl wire on each drum. Jay submitted a bid on the project and it was included in the grant application. Rhode Island Engine Company has been building hydraulic winches, net drums, and other deck gear for the Point Judith fleet for decades.

The net used for shrimp trawling was designed by Robert Taber of Trawlworks, Inc. in conjunction with Captain Loftes. The Company constructed the net and provided the trawl doors, trawl wire, groundgear, and the Nordmore grate. Trawlworks submitted the original bid for the equipment that was included in the grant application.

The bid included in the grant application was for a used Koden sounder/Fishscope from Merriam Instruments. Since the electronics were the responsibility of the Grantee, Captain Loftes decided to install a new Honda HE 737 Color Sounder/Fishscope supplied by Bob Dixon of Chris Electronics of Fairhaven, Massachusetts. Prior to the 1997 phase of the project, Captain Loftes installed a new GPS and a Shipmate Plotter capable of using Bathymetric Charts. The vessel was equipped originally with a Taiyo Loran C Electronic Plotter which did not have chart capability. The Shipmate unit supplied by Chris Electronics, proved unsatisfactory primarily because the Bathymetric Charts necessary for the geographical area were unavailable. The unit was subsequently removed.

Captain Loftes then purchased a P-Sea Plotter with Winn Plot Software which was equipped with Bathymetric Charts from Barry Barrett of Point Judith Electronic Service Corporation of Narragansett, Rhode Island.

V. Findings

A. Actual Accomplishments and Findings

The F/V Mary Elena made fifteen trips over the course of the grant project. One-hundred and seventy-nine tows were made during the fifty-two days at sea. The trip reports document the exact position of each tow, time of day, and time of year. The information describes a firsthand experience of the species caught within the varied depths out to 800 fathoms. In total, 25,157 lbs. of Royal Red Shrimp, 11,770 lbs. of Whiting, and 2,378 lbs. of Monkfish were caught over the period of the grant. In addition, a small incidental catch of Lobsters were taken home by the crew. The exploration did not completely cover the area to the extent that anyone would be able to state that the results of the trip are indicative of what will be found throughout the Hatteras to the Haig Line Region. The project did define the catch in the specific documented tows to establish a basis for further exploration. Trip logs can be found in Appendix IV.

The initial phase of the grant was to design and construct a winch system capable of setting and retrieving trawl gear in depths of 800 fathoms. The details of the mechanical and hydraulic specifications of the system is presented in Appendix II. Captain Loftes, after a number of major and minor modifications to the winch system, can state that the end product is fully capable of a dependable performance in a commercial environment.

The net system is a significant departure from the standard southern Shrimp trawl. The depth of water made the standard double net rig, prevalent in the Gulf of Mexico, impractical to set. The bottom contours and rough bottom with rocks scattered throughout the areas towed, made the Rock-Hopper Sweep a necessity. The captain did employ a full-length tickler chain to compensate for the poor bottom tending features of the Rock-Hopper Sweep compared to the traditional small mud rollers used in the Gulf. The 2½" nylon box net used in the project is a large net with much heavier twine than is traditional. This style of single net can be readily towed by a vessel in the horsepower range of the Mary Elena. The net was also able to withstand the hauling of significant catches of debris on to a net drum without causing other than normal wear. Considering the number of tows made and the hangs encountered, Captain Loftes considers the gear adequate for the purpose of a Shrimp commercial venture. Details of the trawl are in Appendix III.

The not unexpected navigational difficulties encountered while towing on the steep banks and canyons within the geographical area fished requires more sophisticated electronics than is normally used by traditional New England trawlers. Captain Loftes' experience with the problems and his ultimate choice of equipment capable of providing the information to operate under these conditions,

provides valuable advice to fishermen planning to venture into similar deep water fisheries. The details of the electronics used are in Appendix I.

The catches of Royal Red Shrimp, although either insignificant or non-existent in some areas, provide the basic information of where Shrimp was found in commercial quantities. The last five trips in the series, #11-15, indicate the catch rate in an area where Shrimp were found in somewhat marginal commercial quantities.

The landings of Royal Red Shrimp were sold fresh after a mild treatment of Everfresh, a common, safe preservative used throughout the Shrimp industry. The detail of the sales segment of the report confirm that the Shrimp can be sold fresh and preferably with the heads on if limited to a 3-4 day trip. As indicated in the report, the price was not significantly different between heads-on and heads-off when considering the yield difference. The actual sales slips are proof that the Royal Red Shrimp, a virtual unknown species in the market, provide a reasonable return. The price/landing sheets are in Appendix V.

Overall, the project has provided valuable information to the industry. The report is submitted with a high level of detail provided by a fisherman with the intention of assisting other fishermen looking for alternative fisheries.

B. Significant Problems

1. The Winch System: In retrospect, the winch system on the Mary Elena is an efficient, durable, and dependable unit. The original design was well thought out and the target specifications capable of carrying out the purpose of setting and hauling in deep water. The time it took to complete the construction of the winches and the installation phase did not only delay the start of the exploration phase of the project, but was very expensive when considering the time the vessel was laid up. There were also significant costs incurred by the vessel owner in modifying the vessel to accommodate the size of the winches. The cost to modify the vessel's original hydraulic system and power pack to match the power requirements of the winches was, although not unexpected, a much more expensive proposition than planned.
2. Navigation: The electronic equipment necessary to successfully maneuver in the area of the canyons and steep banks in most areas within the geographical boundaries of the grant was more elaborate than originally contemplated. The cost of the electronics was the responsibility of the vessel as set forth in the grant application budget.
3. Gear Conflict: The potential for gear conflict during the project was minimized by the Gear Conflict Resolution between mobile gear fishermen and fixed gear fishermen. The operational areas for each group were clearly defined once the

specific points depicting the geographical boundaries were entered into the electronic plotter. The long line vessels were not a part of the agreement by choice. During the summer months, constant communication was necessary to avoid gear conflicts throughout the length of the Bank with the longliners.

4. Ghost Gear: The most disagreeable problem during the exploratory phase of the grant was the continuing encounters with lost or "ghost" lobster gear. The wire lobster pots are very difficult to remove from the trawl without taking the strain off the twine and cutting the meshes to remove the posts, most of which were broken with sharp, protruding ends. The mending of the small mesh compared to the 6 inch or larger mesh used in Monkfish trawling, caused considerable lost time and aggravation. The cause of the problem was thought to be, in some cases, that broken and unusable pots were dumped outside the normal operational depths of the user groups fishing the banks. The other cause of the problem appears to have been lost gear that was abandoned when the fixed gear vessels moved in shore in the late spring in accordance with the Gear Conflict Resolution. Most of this gear was towed up in depths under 200 fathoms during the months of June and July.

V. Evaluation

- A.1 The original project goals of this grant could be simplified by stating three objectives: a. To develop fishing gear and equipment capable of fishing in depths out to 700 fathoms; b. To explore the sea bottom between 100 and 700 fathoms from Cape Hatteras to the Canadian Line on the south side of George's Bank for Royal Red Shrimp and report findings of concentrations of other species in the region; and c. To determine the most productive way Shrimp should be landed from the vessel as a fresh product, shipped, and sold into the fresh market.

By achieving these goals, the industry would be provided with the guidelines to: Equip a vessel for a commercial Shrimp venture, locate concentrations of Royal Red Shrimp, and sell the product in the fresh market, thereby creating an alternative fishery.

- B. The accomplishments of this project will become known with the publication of this report. The information, we believe, is presented in the level of detail that will enable a fisherman to enter this fishery at least on a seasonal basis. The overall purpose of the Fishing Industry Grants was to provide funds to the industry for the purpose of exploring opportunities that might lead to a more diversified New England fleet. In some ways, the project results were disappointing because the Royal Red Shrimp resource appears to be limited at least from the experiences of this and other deep water grant recipients. In addition, there does not appear to be a large unexploited resource of other known or unknown species in the region. Further exploration should be encouraged using the information available from this series of grants as starting points.

The information on handling the Shrimp provides a quality control process that assures the harvester of a very marketable product. The grant project did just what it was supposed to do and that was to help finance a new venture through the learning curve to a point where most of the mistakes have been made and acceptable solutions have been proven in practice.

- C.1 The project benefited the industry by providing, with a limited amount of analysis, a step-by-step outline in the form of this report on how to successfully enter this Shrimp fishery. Just as important, the pitfalls to avoid are equally discussed. Bottom trawling information on new, unexplored ground where hangs, if previously encountered were not known, is, in itself, valuable information to any future venture. The cost of outfitting the vessel for the 500-700 fathoms fishery is a valuable contribution to the project report. Captain Loftes has made it clear throughout his notes for this report that new entrants should not be overly optimistic about the possibilities for commercial opportunities based on his observations.
- D.1 The fact that over 25,000 lbs. of Royal Red Shrimp were landed over the course of 52 days at sea provides the industry with evidence that there is Shrimp in certain areas of the deep water. During the last few trips, at least one other Mid-Atlantic based vessel began Shrimp fishing as an alternative to other summer opportunities. Over time, with the strong demand for Shrimp in the U.S., the market recognition for the Royal Red Shrimp should improve. The range of prices for whole fresh Shrimp in the New York area markets was encouraging.
- D.2 The benefit to the fish dealers' segment of the industry is difficult to document. The Shrimp was not as firm as other similar product, but then a high percentage is frozen. In general, the markets have a strong preference for fresh product, especially in the New York area. The interest in whole Shrimp as opposed to removing the heads was unexpected initially until the realization that a 2-3 minute soak in an Everfresh solution did not completely protect the exposed tail of heads-off Shrimp. The care of the Shrimp from the time of catch to delivery to the market and ultimately to the end user is the key to a profitable venture.
- E. The need for federal assistance in this project becomes evident in the analysis of the costs. The federal contribution, as requested, was \$251,800, the non-federal provided by the grant recipient, most in cash contributions, came to \$216,440. Overall, the fifty-two days of fishing grossed \$64,567. There was a great deal of effort expended and lost time during the installation of the equipment that is not reflected in the costs. It is evident that undertaking a grant project of this kind can be a major undertaking and is not within the financial ability of many fishermen in the industry, especially at this time. There is no doubt that the extent of the exploration would not take place without assistance and in any event would not become public information.

VII. Conclusions

A. The conclusions derived from the work performed for this project were:

1. The winch system necessary to trawl in depths of 700-800 fathoms requires considerable horsepower. The solution is to use a hauling engine in the 400hp range to drive the hydraulic system. The recommendation is to use two hydraulic motors, one on each side of the winch. The motors should also be capable of two speeds.
2. The electronic package to successfully navigate in the canyon areas and steep banks in the deep water is more sophisticated than would be in common use in most fisheries. For depth out to 250-300 fathoms, most sounding machines would suffice.
3. Royal Red Shrimp, *Pleoticus robustus*, can be found in commercial quantities but only in limited areas based on our exploratory tows. The majority of the Shrimp were caught in the 200 fathoms range during the summer months. Because the Shrimp were located in the area closed to mobile gear from November to June, no tows were made during the winter months to verify the presence of the Shrimp. Captain Loftes has serious doubts that this is a sustainable fishery, especially if no further discoveries are made indicating a broader distribution in "commercial quantities".
4. The Royal Red Shrimp can be landed in a whole, fresh form with careful handling. The product should be treated with a mild solution of Everfresh or equal preservative. The Shrimp has a reasonable level of acceptance in the fresh market. Prices were relatively strong considering the Royal Red as a fresh product was a relative unknown.

B. The project was successful in providing the information to satisfy the intent of the grant. The results were less optimistic than the grant recipient had anticipated, but there was enough of a catch to warrant participating in the fishery on, at least, a seasonal basis.

C. Further work should be done in the deep water to determine if there may be additional significant quantities of other species. There is information on Monkfish, Whiting, Red Crab, Lobster, and now Shrimp. The fact that some Roughy, Rat-tails, Greenland Halibut and Redfish were caught during the exploratory phase of the grant leaves an unanswered question of whether or not these species occur in significant quantities in areas that were not explored during the projection of the deep water grants or during different seasons. Captain Loftes has every intention of carrying out further exploration in the future. There is still a need to expand beyond the traditional fisheries.

Appendix I

Specifications of the Fishing Vessel Mary Elena

The F/V Mary Elena was built at LaForce Shipyard in Bayou La Batre, Alabama in 1990. The vessel is 90 feet in length overall with a beam of 22.75 feet. The vessel was built as a small mesh multi-species trawler. There are three netdrums, two stacked over the ramp and one aft of the wheelhouse.

The main engine is a Caterpillar diesel rated for 1000 hp at 2100 rpm's. The vessel has a 150 hp hydraulic bow thruster and a Detroit 8-92 diesel hauling engine rated for 400 hp at 2100 rpm's driving the hydraulic package.

The vessel is equipped with a hydraulic deck conveyor. There is also diesel-driven refrigeration units with a 30 ton capacity that provides refrigerated sea water to five insulated holding tanks capable of holding 120,00 lbs. of fish. The vessel also has a fresh fish ice hold. There are accommodations for up to 8 men.

The electronics package on the vessel includes a full compliment of radars, fishscopes, sounders, lorans, GPS's, and electronic plotters. New equipment installed for this project was a Honda HE737 color sounder with multiple frequencies of 28, 55, and 100 kHz, a P- Sea Plotter with Wind Plot Software, and a GPS.



Appendix II

Operation of Winch System and Winch Specifications

The winch system on the F/V Mary Elena has direct drive to the drum from motors on either side. This arrangement requires that the wire, when setting, is powered out. The controls for the setting and hauling the trawl doors are located in the rear of the pilot house with a full view of the deck and the winches.

The sequence of events to set out are as follows: The hauling engine is started supplying power to the hydraulics. The net is deployed from the stern net reel by the crew. The crew man operating the net drum has complete control of the drum. The net is set including the legs and ground cables, hooked to the doors, then disconnected from the drum. At this time, the Captain takes over, first lifting both doors so the dog chains, holding the doors, can be removed. Next, the wire counters are set at zero. The doors are dropped to the door markers using power out with the winch motors set at full displacement. The boat is then brought to full speed. When the doors are spread, the winches are powered out. At this time, the displacement speed controls are set to minimum displacement or high speed. The hauling engine speed is increased to match the wire payout to the speed of the boat. The doors are controlled by the hauling engine throttle throughout the set. The speed of the payout varies with weather conditions. Care must be taken to not payout faster than the boat is moving, otherwise the wires go completely slack which could cause a foul set. The wires are run out to the desired length, slowing both the vessel and the hauling winch prior to coming to a complete stop with the winches. The brakes are applied to stop the drums.

The brakes on the winches have bands on either side of each drum and are controlled by air. The two brakes were considered to be more positive because of the large diameter of the drums. Since each winch motor has two separate displacement settings with two motors to each winch, there are 4 speed settings - see specifications.

The sequence to haul back is as follows: Start the hauling engine. Set the motor displacement to selections 1 through 4 depending on how much wire is on the drum. If 1200 fathoms is out, the high setting (4) is used to start the wire in. The high speed setting has a lower line pull up to 4,297 lbs., but will turn the winch at maximum speed in order to retrieve the wire faster with a more or less empty drum. As the hydraulic pressure increases, the settings are changed to the larger displacement. The sequence continues until the doors come out of the water and the doors are stopped and held with the help of the brakes while the dog chains are hooked into the doors. The wire is payed out enough to allow the weight of the doors to come on the dog chains. The hook ups are disconnected and the drum sequence begins.

Rhode Island Engine High Capacity Winches Performance

All values are calculated using Tyronne HP7-350 aid hydraulic pumps putting out 66.35 GPM each (2) and a wire capacity of 1200 fathoms of 3/4" wire (full drum).

Speed	1(low)	2	3	4 (High)
Displacement	383 cubic in.	287 cubic in.	249 cubic in.	153 cubic in.
Line Speed (Feet per Min.)	440 F.P.M.	583 F.P.M.	682 F.P.M.	1100 F.P.M.

Actual line pull full drum (1200 fathom of 3/4")

Original 6-71 Detroit Diesel hydraulic engine @ 2000 R.P.M.

Line pulls for winches are restricted to 2400 P.S.I. system pressure due to the horse power limitations of the 6-71 hydraulic engine.

Speed	1(low)	2	3	4 (High)
Line Pull actual @ 2400 P.S.I.	6,446 lbs. pull	4,841 lbs. pull	4,197 lbs. pull	2,578 lbs. pull

Replacement 8V-92 Detroit Diesel hydraulic engine @ 2000 R.P.M.

Speed	1(low)	2	3	4 (High)
Line Pull actual @ 4000 P.S.I.	10,743 lbs. pull	8,069 lbs. pull	6,994 lbs. pull	4,297 lbs. pull

Appendix III

Shrimp Net Designed for the Project

The Shrimp net used in the project was designed by Robert Taber of Trawlworks in Narragansett, RI with input from Captain Loftes based on his vision as to the work expected to be performed. The company supplied the twine and constructed the net.

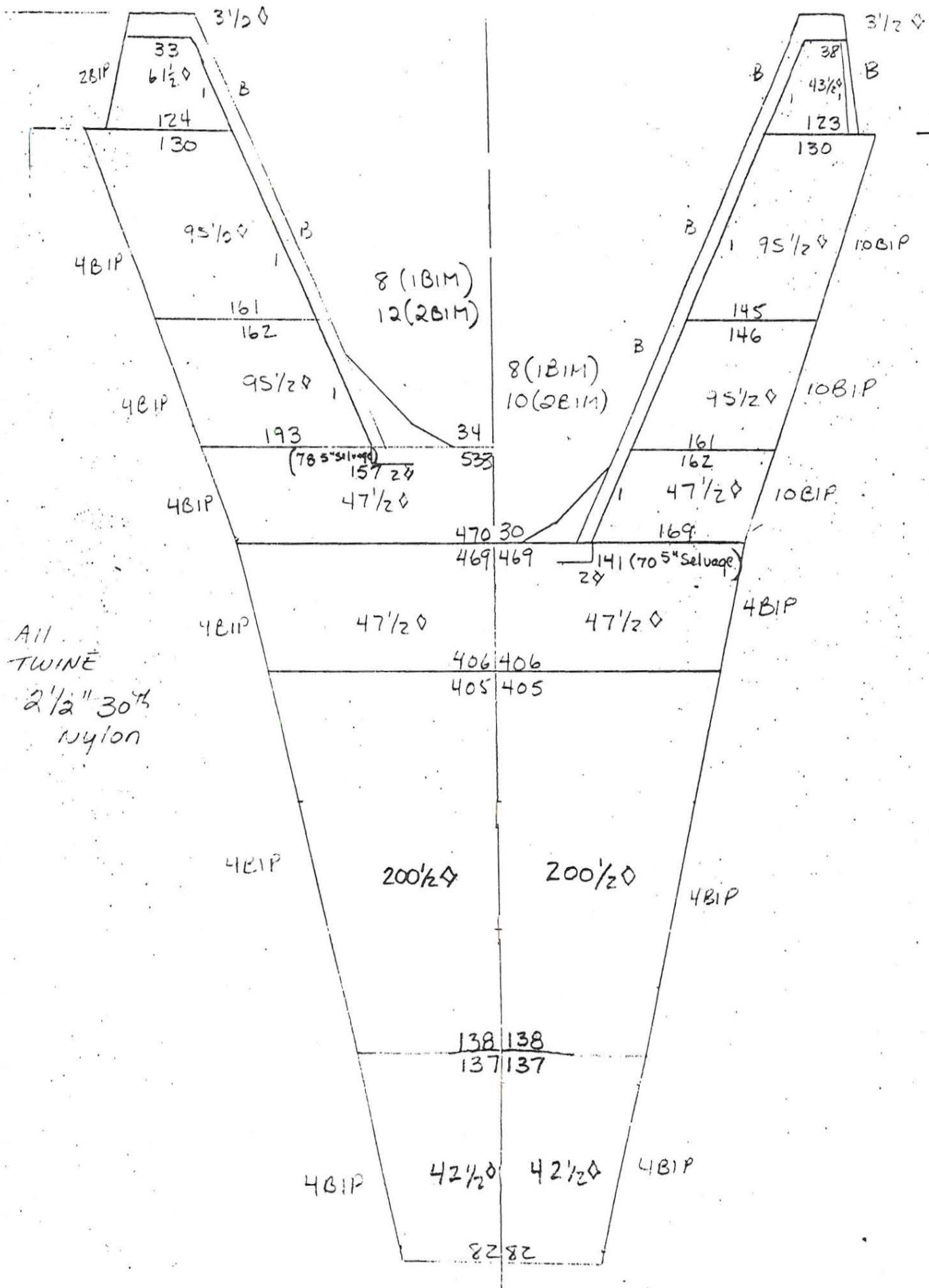
The net was made of 2 1/2", 30 thread nylon throughout and hung on stainless steel combination wire rope with rubber cookies on a 3/4" wire sweep. The selvedge of the net was 5" nylon with the 2 1/2" twine attached for ease in repair.

The net was used with a 3/8" tickler chain attached from wing end to wing end. The original center section was replaced with 10" down to 8" Rock-Hopper style sweep. This was done because of the significant number of rocks encountered throughout the region.

The net used is considerably heavier than the traditional light multiple nets outfitted with mud rollers used in the Gulf Shrimp fishery. It was determined from the outset that the net had to be constructed heavy enough to withstand the abuse of hangups and deployment using a net drum.

The ground gear used with the net was 20 fathom legs in an effort to obtain a designed headrope height of approximately 12 feet. An additional 20 fathoms of ground cable was used to allow the doors to work more effectively on the bottom as well as allowing the doors to remain farther apart when setting in the deep water. It was acknowledged that the ground gear would not contribute to the Shrimp catch as compared to the herding effect of ground gear with most groundfish.

938 x 2 1/2"
HL = 4600



✓ NEW TRAWL

FISHING VESSEL MARY ELENA

REPAIR

TRAWL 938 x 2.5

2-SM

HL 4600

TWINE SIZES 5.0 FOOTROPE EXT = 3'9" DATE 8 / 2 / 1995

BOTTOM 30 MESHES @ 2.5 = 72.5 x 3.25 "COMBO" 1/2" (5/8)" 3/4" 7/8"

8 1B1M @ 4.25 = 34 SS - GALV (2 PC SS) - STEEL

11 2B1M @ 6.5 = 71.5 CUT LENGTH'S REG - NEW WAVE

131.5 "BARS @ 1.05 = 688 " (57'4") HL = 2 X 2130
HD = 2 HD WINGS 2 x 1364
XHD CENTER 1 x 1229

JIB + 1/2# = 136.5 " (11'4.5")

WING + 1/2# = 252 21'

TOTAL WEBBING = 1659.5 " ETE

EXT = 192 cm - 8cm 3/4 BS = 184 cm

TOTAL HL = 4600

FLOATS? YES NO 84 float

TOP 34 MESHES @ 2.5 = 82.5 " (7'3.25") TRAVELER 3/8" (9/16)" 1/2"

8 1B1M @ 4.25 = 34"

SS OR (GALV)

13 2B1M @ 6.5 = 84.5 " (7'0.5")

114.5 " BARS @ 1.044 = 595 " (49'7")

EXT = 5/8 GALV
CUT LENGTH = 4 X 231

JIB + 1/2# = 183 " (15'3")

WING + 1/2# = 250.5 " (20'10.5")

TOTAL WEBBING = 1509.5 " (125'9.5") ETE

EXT = 192 cm - 8cm 3/4 BS = 184 cm

TOTAL HEADROPE = 4203

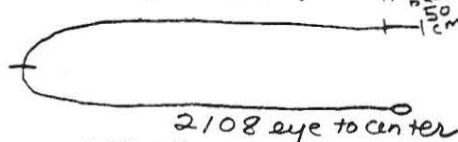
WE START IN = NA

NEW WAVE TRAVELER
9/16" 6 X 7

BOTTOM 26 # BARS @ 1.025 = 133.25 " (11'1.25")

TOP 35 # 2B1M @ 1.025 = 179 " (14'11")

TOTAL WEBBING = 312.25 " ETE TOTAL WE = 1319



Appendix IV

The Trip Logs from the Exploratory Phase of the Project

Appendix IV includes the trip logs from all 15 trips made over the period of the grant. The position of the vessel at the time the net was set and the position and time of the haul back is expressed in TD's - using Loran C and the latitude/longitude beginning with trip #4 after a GPS was installed. The depth is indicated in fathoms.

The unedited log reports also include brief comments on weather, hangups, lobster gear encountered, and actions taken during or after a particular tow. The summary comments on each trip is included in Section IV A.

[illegible]

TRIP # 1

DAY	DATE	Toss	START TIME	DURATION MIN	START Position		END Position		NOTES	COMMERCIAL CATCH		
					LAT	LONG	LAT	LONG		LBS	LBS	LBS
1	3/4/96	1	06:00	100min	73°51'20"	38°13'	73°52'	38°09'	100-200 FTH	900 LBS	300 LBS	10 LBS
1	3/4/96	2	09:00	105min	73°52'	38°09'	73°51'	38°05'	90-160 FTH	50 SCUP	400 SQUID	FS LBS Big Roughly
1	3/4/96	3	12:00	90min	73°52'	38°06'	73°51'50"	38°10'	110-180 FTH TURNS-UP & 051, Back to turning	25 SCUP	200 SQUID	50 LBS Big Roughly

1/V MARY ELENA

TRIP # 2

Ref	DATE	Tow#	START Time	DURATION	START Position LAT LONG	END Position LAT LONG	NOTES	COMMERCIAL CATCH					
2	3/15/91	1	06:30	30 min	73°51'30 38°13	-	100-200 ft	DOG FISH 25,000					
2	3/15/91	2	09:30	60 min	73°32 38°09	73°51 38°07	100-150 ft	DOG FISH 15,000					
2	3/15/91	3	12:00	240 min	73°45 38°07	73°40 38°25	235-325	BLACK DOG FISH 100	HAKE 100	MONK 300	ROCK CRAB 250	SHRIMP 15	LOBSTER 90
2	3/15/91	4	19:00	180 min	73°45 38°05	73°41 38°01/150	400-800 100-200 ft 12 FLOES	BLACK DOG FISH 50	HAKE 25	CRAB HABIT 3	ROCK CRAB 10	SHRIMP 5	LOBSTER 15
2	3/16/91	5	04:00	140 min	73°15 38°31	73°10 38°36	210-250 SW WIND 20-30	WHITING 1000	HAKE 50	MONK 500	ROCK CRAB 25	SHRIMP 10	LOBSTER 60

ALL TOWS WERE MADE WITH ROCKET HOOKER NET
16CM MESH GRADUATED DOWN TO 9CM LINE IN GOOD END

Trip # 6

F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

[illegible]

Trip # 3

F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

[illegible]

Trip # 47

F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

[illegible]

Trip # 5 F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

#	Date	Time	Tow		Set Position		Haul Position		Depth	Commercial Catches (LBS) and Discards						Bag of STRAW + Mud
			TD'S	Lat Long	TD'S	Lat Long	TD'S	Lat Long		Shrimp	MONK	Whiting	Hake	Red Crab	LOBSTER	
#1	7/19/96	8:15 AM	1481	39:48.7	14822	39:46	230	230	230	Shrimp 2	MONK 10	Whiting 15	Hake 5	Red Crab —	LOBSTER —	Bag of STRAW + Mud
Set	8:15 AM	1:35	43248	71:45.4	228	71:46.5	207	207	207							
#2	11:00 AM		14837	39:43.4	14903	39:35.7	224	224	224	Shrimp 5	MONK 50	Whiting 150	Hake 10	Red Crab 5	LOBSTER 100	
#3	4:20		43204	71:48.5	43142	71:58.4	205	205	205							
#4	4:15 PM		14909	39:35	14964	39:28	200	200	200	Shrimp 5	MONK 10	Whiting 200	Hake 25	Red Crab 200		
#5	4:00		43137	71:54	43077	72:07.6	240	240	240							
#6	9:00 PM		14972	39:30	14903	39:37.4	140	140	140	Shrimp 2	MONK 30	Whiting 50	Hake 25	Red Crab 50	LOBSTER 20	
#7	3:40		43095	72:09.7	43157	71:58.8	165	165	165							
#8	7:20 PM	1:45 AM	14894	39:38.2	14838	39:45.7	170	170	170	—	25	75	10	10	25	STEAM TO EAST
#9	3:45		43163	71:58.3	43224	71:44.5	173	173	173							
#10	7:20 PM	1:45 AM	14591	39:58.2	14505	39:59.8	197	197	197	Shrimp 100	MONK 100	Whiting 75	Hake 20	Red Crab 20	LOBSTER 5	Longline AS IN AREA AND TO CRUISE
#11	4:00		43305	71:08.4	43301	70:52.8	184	184	184							
#12	7:20 PM	3:30	14448	39:58.9	14408	39:56.9	185	185	185	Shrimp 100	MONK 75	Whiting 50	Hake 25	Red Crab 25	LOBSTER 15	
#13	4:30		43301	70:51.3	43276	70:33.5	210	210	210							
#14	7:20 PM	8:45	14407	39:56.7	14526	39:58.7	210	210	210	Shrimp 100	MONK 100	Whiting —	Hake 15	Red Crab 25	LOBSTER 5	
#15	6:00		43274	70:30.2	43302	70:56.6	187	187	187							

Trip # 5
F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 F.T.M.

Date	Tow	Set Position	Haul Position	Depth	Commercial Catches (LBS) and Discards						
Time	Time	TDS	Lat Long	TDS	Lat Long	Depth					
#9	7/21/96	14527	3958.9	14412	3957.0	184	SHRIMP	MONK	WHITING	MONK	LOSSIES
	4:00 AM						160	80	50	15	15
	4:45	43301	7056.8	43277	7034.3	202					
#10	7/21/96	14411	3957.4	14468	3958.4	205	SHRIMP	MONK	WHITING	MONK	
	12:20						40	20	20	10	10
	3:10	43280	7034.2	43294	7046.4	192					
#11	7/21/96	14470	3958.7	14528	3958.9	188	190	25	15	15	15
	4:15 PM										
	3:00	43296	7046	43301	7057.1	184					
#12	7/21/96	14531	3958.8	14477	3958.	187	SHRIMP	MONK	—	—	10
	8:00 PM						140				
	4:20	43304	7057.5	43288	7041.3	185					
#13	7/22/96	14448	3957.6	14529	3958.8	183	SHRIMP	MONK	WHIT	MONK	
	1:15 PM						190	25	25	10	
	3:45	43287	7041.4	43303	7057.3	186					
#14	7/22/96	14529	3958.9	14438	3957.5	183	SHRIMP	MONK	WHIT	MONK	
	5:45 PM						220	15	50	25	
	4:45	43304	7057.2	43284	7039.4	185					
#15	7/22/96	14432	3957.4	14504	3950	186	SHRIMP	MONK	WHIT	MONK	
	11:20										
	3:20	43282	7039.7	43285	7052	177	110	50	50	10	
#16	7/22/96	14536	3958.8	14438	3957.3	186					
	4:20										
	5:00	43306	7058.1	43282	7039.3	187	175	30	50	20	
#17											

CHANGED NET ALL 22

Being harassed by
two submarines
Told to leave area

Trip #

F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

[illegible]

Trip # 6

F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

Date	Tow	Set	Position	Haul	Position	Depth	Commercial	Catches	(LBS)	and Discards	Notes
Time	Time	TD'S	Lat Long	TD'S	Lat Long	Depth	Commercial	Catches	(LBS)	and Discards	Notes
7/29/96	14:35	14532	3959.5	14116.2	39:59		Shrimp	None	Whiting	Hake	
3:20	43309	70:58	43299	70:45.6	176		320	50	300	20	
7/29	19:00	466	3958.9	14544	3959	180		275	30	250	20
400	297	7045.4	43310	70:45	190						
7/30	0:00	14541	3959.7	14468	39:59	184		310	25	200	10
340	43311	7059.7	43299	70:45.9	175						
7/30	07:00	14468	39:59	14544	3959	177		320	40	150	10
4:00	43300	70:45	43310	71:00	194						
7/30	14:20	14546	39:59.11	14466	39:59.2	184		300	50	200	10
4:00	43312	71:00	43300	70:45.6	178						
7/30	19:45	14467	39:59.2	14538	39:59.9	172		300	25	100	15
3:30	43300	70:45.8	43312	70:59.3	172						
7/31	01:30	14540	39:59.8	14464	39:59.2	172		440	40	125	15
3:45	43312	70:59.5	43300	70:45.1	171						
7/31	05:30	14468	39:59	14545	39:59	174		320	60	150	10
4:00	43300	70:45	43312	71:00	190						
		</									

Trip 終

9

F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

[illegible]

Trip # 7

F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

Date	Tow	Set	Position	Haul	Position	Depth	Commercial	Catches	(lbs)	and Discards		
Time	Time	TD'S	Lat	Long	TD'S	Lat	Long	Depth	Commercial	Catches	(lbs)	and Discards
8/18	05:00	14545	39:59	14472	39:59.3	194	194	300	80	50	30	25
4:00	43312	70:58	43301	70:46.1	172	172	300	80	50	30	25	
8/18	10:20	14465	39:59	14544	39:59	179	179	250	50	40	20	15
3:50	43298	70:45	43306	70:00	196	196	250	50	40	20	15	
8/18	15:45	14542	39:59	14466	39:59	190	190	400	60	60	15	10
3:45	43309	70:00	43300	70:45	171	171	400	60	60	15	10	
8/18	20:45	14465	39:59	14544	39:59.3	172	172	220	40	20	—	75
3:50	43300	70:45.5	43309	71:00	195	195	220	40	20	—	75	
8/19	06:30	14538	39:59	14465	39:59.2	176	176	250	40	100	25	20
3:45	43309	70:59	43300	70:45	171	171	250	40	100	25	20	
8/19	11:00	14466	39:59	14542	39:59	176	176	260	30	90	10	15
3:30	43298	70:45.6	43309	70:59	177	177	260	30	90	10	15	
8/19	15:45	14543	39:59	14465	39:59	174	174	150	25	75	15	25
3:50	43310	71:00	43300	70:45	171	171	150	25	75	15	25	
8/19	21:20	14469	39:59.3	14542	39:59.6	170	170	220	40	100	10	10
3:50	43301	70:46	43311	71:00	170	170	220	40	100	10	10	

Trip # 8

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Trip # 8

F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

Date	Tow	Set Position	Haul Position
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Time	Time	TD'S	Lat Long	TD'S	Lat Long	Depth	Commercial Catches (LBS) and Discards
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[illegible]

Trip # 9 F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

Date Tow Set Position Haul Position

Rock Hopper Net with thicker chain

Time	Tow	Set	Position	Haul	Position	Depth	Commercial Catches (LBS) and Discards							
Time	Tow	TD'S	Lat Long	TD'S	Lat Long	Depth	Shrimp	MONK	Whiting	LOBSTER				
8/29/96	01:00	26347	38°54	26384	38°48	330	2	25	10	1				RADICAL DEPTH change's 800 ft. Towline
3:00		42770	72°48	42710	72°55	300								
8/29/	09:00	26494	38°30	26445	38°28	380		10	20					SCARLET SHRIMP 3
1:45		42524	73°13	42494	73°16	425								LONG FIN HARRE 100
8/29	14:00	26447	38°26	26544	38°14	650								11000 FTM WIRE 100 LBS RAT TAIL
3:45		42476	73°16	42405	73°25	650	2							
8/29	20:00	26586	38°19	26563		160	2	50	50					ROCKY TOWER OVER 3 SANDWICHES WESTSIDE WITH TON CAPON
20:00		42399	73°33	42382		510								
8/30	00:00	26582	38°18	26604	38°13	275								LOST COD END PAPERED BULL ROPE MUD LAY TO RIG COD END
3:00		42391	73°32	42331	73°37									
8/30	10:00	26613	38°13	26631	38°07	260	2	3	50					200 LBS ROB CRAB 1 LG CUSK
3:00		42331	73°39	42268	73°43	460								
8/30	15:00	26650	38°07	26684	37°57	370								TORRE OUT WING + Belly
3:30		42219	73°47	42149	73°55	270	1	25	25					HURRICANE EDWARD MAY COME THIS WAY 230 MILES TO BAY TOWNS

Trip # 10

FV MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

DEPART Port Jervis 6/10/97 at 10:00

Date	Tow	Set Position	Haul Position																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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Trip # 10

F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

OFF SHORE AREAS OPEN TO DRILLING
AS OF 6/16/97

AS OF 6/16/97

Date	Tow	Set	Position	Haul	Position	AS OF	6/16/97
Time	Time	TDS	Lat	Long	TDS	Lat	Long
				Depth		Commercial	Catches (LBS) and Discards
6/15/97							
6/16/97	14:53	46°00'	141°17'	39°59'	170	Shrimp	MONK
09:30	43°34'	70°59'	433°01'	70°51'	185	36.0	60
2:30	43°34'	70°59'	433°01'	70°51'	185	150	15
6/16/97	14:44	39°50'	144°46'	39°58'	180	110	25
12:30	43°30'	70°49'	432°89'	70°41'	180	100	10
2:20	43°30'	70°49'	432°89'	70°41'	180	15	15
6/16/97	14:48	39°59'	145°42'	39°59'	183	175	40
16:30	43°31'	70°42'	433°12'	433°12'	190	120	15
3:00	43°31'	70°42'	433°12'	433°12'	190	5	5
6/16/97	14:54	40°00'	144°47'	39°59'	193	240	50
20:00	43°31'	71°00'	433°01'	70°49'	186	220	10
3:30	43°31'	71°00'	433°01'	70°49'	186	5	5
6/17/97	14:48	39°50'	145°43'	40°00'		210	30
04:30	43°30'	70°48'	433°15'	71°00'	186	150	10
3:00	43°30'	70°48'	433°15'	71°00'	186	5	5
6/17/97	14:54	40°00'	144°48'	39°59'	182	380	20
08:00	43°31'	71°00'	433°00'	70°48'	194	175	15
3:15	43°31'	71°00'	433°00'	70°48'	194	10	10
6/17/97	14:48	39°58'	145°47'	40°00'	195	325	25
12:00	43°29'	70°49'	433°14'	71°01'		200	10
3:30	43°29'	70°49'	433°14'	71°01'		15	100

STEERING EAST WORKING
ON BEAR 3 NETS
TORN UP

GHOST ROSSIE RIGOR

Trip # 10

FV MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

Date	Tow Time	Set Position TD'S	Set Position Lat Long	Haul Position TD'S	Haul Position Lat Long	Depth	Commercial Catches (LBS) and Discards						
							SHRIMP	MONK	WHITING	HARE	LOBSTER	REDCRAB	
6/17/97	16:10	14548		14481	39°59'								Ghost gear
	3:40	43314		43300	70°48'	181	315	30	150	10	10	25	ALL TOWS
6/17/97	22:30	14480	39°54'	14537	40°00'	184							Tore OFF COO END
	3:25	43300	70°48'	43316	70°59'	170	-	-	-	-	-	-	LOST 3RD Belly
													6 H.R. Repair
6/18/97	07:00	14542	39°58'	14486	39°58'	191							
		43304	70°50'	43247	70°47'	195	350	25	200	10	10	150	
6/18/97	11:30	14486	39°58'	14546	40°00'	198							
	3:20	43247	70°49'	43315	71°00'	191	280	15	150	15	5	200	
6/18/97	15:30	14539	40°00'	14481	39°59'	177							
	3:15	43314	70°50'	43300	70°48'	181	360	15	175	10	2	-	
6/18/97	19:20	14477	39°54'	14535	40°00'	182							
	3:30	43299	70°47'	43314	70°59'	175	300	10	200		5	-	

Active - 6/19/97 at 0000

Trip # 11

F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

Left P.J. 4 PM 21st

Date	Tow	Set Position		Haul Position		Commercial Catches (LBS) and Discards							
Time	Time	TD'S	Lat Long	TD'S	Lat Long	Depth	SHRIMP	MONK	WHITING	HARE	LOBSTER	REVENUE	
6/22/97	05:00	14600	39°58	14540	40°00	181							Big Ball longline - MONO + POTS SMALL Holes
	300	43310	70°10	43319	71°00	170	25	30	200	10	20	15	
6/22/97	10:00	14541	40°00	14471	39°59	172							
	3:35	43315	71°00	43300	70°46	176	100	25	150	5	25	-	
6/22/97	14:25	14472	39°58	14416	39°57	189							ONE Tow east N.G.
	3:30	43246	70°46	43281	70°35	187	30	20	175		15	25	
6/22/97	20:00	14419	39°55	14473	39°57	200							
	345	43268	70°34	43288	70°46	220	15	50	200	10	5	250	
6/23/97	04:30	14479	39°58	14547	39°54	207							Tore up
	420	43291	70°47	43307	71°00	193	275	60	300	-	5	200	
6/23/97	13:20	14548	39°59	14474		207							
	3:50	43308	71°00	43295		193	160	30	200	10		200	
6/23/97	18:30	14485	39°54	14544	39°59	186							DUMPER POTS ON HANG
	3:30	43301	70°44	43313	71°00	190	120	20	150		5	100	
6/24/97	04:30	14537	40°00	14484	39°59	171							
	400	43313	70°59	43300	70°45	183	160	10	150	10	15	-	

F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

Arrived P.S. at 17:00

[illegible]

Trip # 12

FV MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

DEPART P.S. 6/27/97 14:00

V. J. J. J.

Date	Tow	Set	Position	Haul	Position	Depth	Commercial Catches (LBS) and Discards					
Time	Time	TDS	Lat Long	TDS	Lat Long	Depth	Shrimp	MONK	Whiting	Parrot	Loose Fish	Perch
6/28/97	04:00	14534	39°59	14479	39°59	180	5400					
3:15		43306	70°50	43301	70°47	186	40	25	150	-	20	200
6/28/97	04:00	14476	39°58	14545	39°58	205						
04:00		43244	70°47	43304	71°00	200	220				5	300
3:40												
6/28/97	14:00	14547	39°50	14485	39°58	200						
14:00		43305	71°00	43294	70°48	205	160	70	175	15	5	250
3:30												
6/28/97	18:40	14441	39°50	14546	40°00	195						
18:40		43298	70°50	43313	71°00	196	140	20	200	10	5	150
3:50												
6/29/97	05:00	14546	39°59	14481	39°58	195						
05:00		43311	71°00	43296	70°48	194	120	30	100	5	20	100
6/29/97	09:20	14484	39°58	14534	39°58	205						
09:20		43294	70°48	43302	70°58	191	80	25	150		10	200
2:40												
6/29/97	13:10	14534	39°58	14592	39°58	198						
13:10		43303	70°59	43306	71°08	195	25	10	100	15	10	200
2:40												
6/29/97	16:45	14592	39°58	14572	39°58	192						
16:45		43309	71°08	43298	70°54	192	100	25	100	-	15	50
4:00												

2000 ELKEX

POTS

MORE POTS
DUMPED GEAR ON
HANGJung up NOBBLES
MUN + STARDUTOWEN TOWEST
N.G.

Trip # 12

F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

Date	Tow	Set Position	Haul Position	Commercial Catches (LBS) and Discards									
Time	Time	TDS	Lat Long	TDS	Lat Long	Depth	Shrimp	Munk	Whiting	Hake	LOBSTER	Redfish	
6/29/97	21:15	14512	39°58	14580	39°58	189	100						
3:15		43244	70°54	43305	71°06	194							
6/30/97	64:45	14590	39°58	14509	39°58	192	80						
4:00		43308	71°08	43244	70°53	190							
6/30/97	09:50	14507	39°59	14428	39°59	182	20	20	100	15	5	25	Long 428 - 277 Big 1 Rock - DUMPER ROCK 20T 144326 - 432601 2627F Tore knife & cod end
4:00		43302	70°53	43277	70°37	198							
6/30/97	16:00	14465		39°59	14547		410	50	200	20	5	200	LAY TO WORKED ON GEAR
4:20		43247		70°45	43302	198							
7/1/97	4:45	14546	39°59	14481	39°58	202	20						
3:30		43307	71°00	43245	70°49	197							
7/1/97	09:15	14479	39°59	14546	40°00	175	5	20	150	5	10	-	HOUSE IN SIDE NET
3:20		43301	70°48	43314	71°00	179							
7/1/97	14:30	14541	39°57	14578	39°56	230	10	20	200	100	2	1000	50 LBS SH BRAT TAILS
1:45		43291	70°58	43281	70°53	245							
7/1/97	18:00	14575	39°54	14545	39°54	320	0	15	50	-	-	500	TWO VIREO FISH 10 LBS BRAT TAILS
2:00		43265	70°52	43270	70°58	315							

ARRIVED P.T. 7/2/97 1PM

Trip # 13

FV MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

Depart P.J. 16.00 7/5/97

Date	Tow	Set	Position	Haul	Position	Depth	Commercial Catches (LBS) and Discards						
Time	Time	TDS	Lat Long	TDS	Lat Long	Depth	Shrimp	Totals	Whiting	Hake	Loosefin	Pre-fillets	
7/6/97 06.00		14627	39°51'	14617	39°57'	210	5	10	10	10	-	50	Shadon east edge of Black canyon
1:20		43330	71°15'	43302	71°18'	263	5	20	25	30	1	-	Stearns S.W.
7/6/97 08:30		14662	39°56'	14711	39°53'	193	5	20	25	30	1	-	Stearns S.W.
2:30		43294	71°20'	43280	71°23'	191	5	20	25	30	1	-	Stearns S.W.
7/6/97 13:00		14818	39°48'	14846	39°43'	184	20	15	50	20	3	150	Stearns S.W.
2:00		43241	71°46'	43207	70°50'	193	20	15	50	20	3	150	Stearns S.W.
7/6/97 17:00		14934	39°33'	14950	39°31'	187	2	10	20	-	41	-	Stearns N.E.
1:20		43117	72°03'	43103	72°06'	191	2	10	20	-	41	-	Stearns N.E.
7/7/97 04:00		14539	39°59'	14479	39°59'	190	1	10	25	-	5	-	Stearns S.W.
3:10		43309	70°54'	43299	70°47'	181	1	10	25	-	5	-	Stearns S.W.
7/7/97 09:20		14478	39°58'	14511	39°58'	208	140	20	50	10	10	-	Stearns S.W.
3:20		43293	70°47'	43299	70°54'	205	140	20	50	10	10	-	Stearns S.W.
7/7/97 13:00		14546	39°58'	14479	39°58'	205	180	10	75	5	10	50	Stearns S.W.
3:00		43298	71°00'	43294	70°47'	200	180	10	75	5	10	50	Stearns S.W.
7/7/97 16:45		14483	39°57'	14550	39°58'	218	260	10	100	10	5	200	Stearns S.W.
3:30		43289	70°48'	43301	71°00'	214	260	10	100	10	5	200	Stearns S.W.

Trip # 13

F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

Date	Tow	Set Position	Haul Position																	
Time	Time	TD'S	Lat Long	TD'S	Lat Long	Depth	Commercial Catches (LBS) and Discards													
7/7/97	20:45	14549	39°59	14482	39°58	204	Shrimp	Mont	Whiting	Discards	Logistics	Remarks								
2:30		43305	71°00	43245	70°48		240	15	50	5	5	50								
7/8/97	05:30	14479	39°58	14546	39°58	208	320	10	50	5	2	75								
3:20		43291	70°47	43300	71°00	206														
7/8/97	09:30	14549	39°58	14486	39°58	202	335	10	50	-	5	50								
3:00		43300	70°59	43297	70°49	197														
7/8/97	14:00	14483	39°58	14549	79°58	195	320	15	50	-	3	50								
3:00		43296	70°48	43299	71°00	214														
7/8/97	17:45	14550	39°58	14480	39°58	203	260	20	50	5	-	50								
3:30		43303	71°00	43295	70°47	193														
7/8/97	21:30	14481	39°58	14541	39°58	193	160	5	25	5	2	25								
2:05		43301	70°48	43301	70°59	196														

No more hauls

Trip # 14

FV MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

Depart Point Lueders 15:00 7/12/97

Water Temp has warmed up 75° long lines in area
Ability to move is restricted

Date Tow	Set Position	Haul Position	Commercial Catches (LBS) and Discards				
Time	Time	TD'S	Lat Long	TD'S	Lat Long	Depth	
7/13/97 04:00 2:45	145344 43301	39°58' 71°00'	14488 43295	39°58' 70°49'	201 208	Ship 150	None 10
7/13/97 68:00 3:30	14478 43300	39°54' 70°47'	14546 43302	39°58' 71°02'	182 200	230	15
7/13/97 14:00 4:00	14550 43302	38°58' 71°00'	14467 43297	39°59' 70°45'	198 182	70	10
7/13/97 14:45 4:10	14468 43292	39°58' 70°45'		39°58' 71°00'		140	15
7/14/97 04:00 3:50	14543 43304		14467 43296	39°58' 70°45'	194 184	200	5
7/14/97 10:10 4:10	14467 43293	39°58' 70°45'	14550 43303	39°58' 71°00'	186 220	220	20
7/14/97 17:00 2:45	14546 43311	39°58' 71°09'	14551 43312	39°59' 71°01'	182 188	130	10
7/14/97 20:00 4:10	14548 43315	40°00' 71°01'		39°58' 70°45'	193	120	20

Shrimp
None
Whiting
Hake
Losses
Red snapper

PT Tote Hole in
humer

200+ deeper all lines

Haul and Slamm
WOT 14:00

Trip # 1

F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

[illegible]

Trip #

15

F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

DEPART P.S. 7/19/97

Date	Tow	Set Position	Haul Position	Depth	Commercial Catches (LBS) and Discards								
Time	Time	TDS	Lat Long	TDS	Lat Long	Depth	Shrimp	MONIE	Whiting	Hake	Loose Fish	Red Crab	
7/20/97	05:00	14548	39°39	14472	39°58	195	Shrimp	50					
4:10	43306	71°00	43294	70°46	200		10	350	20	5	50		Big Sea + Ed + L + M
7/20/97	10:30	14472	39°58	14543	39°58	188							
3:45	43295	70°46	43303	70°59	189		10	5	200	10	5	-	
7/20/97	16:15	14540	39°58	14477	39°57	210							
3:40	43300	70°59	43288	70°46	218		285	10	250	10	2	250	STARBU
7/20/97	21:00	14472	39°57	14546	39°57	210							
3:30	43290	70°46	43297	71°00	211		240	15	100	15	-	100	
7/21/97	05:00	14545	39°58	14468	39°57	208							
4:00	43299	70°59	43284	70°45	209		300	20	75	5	-	200	
7/21/97	9:45	14467	39°58	14549	39°57	207							
4:20	43294	70°45	43298	71°00	216		250	25	75	5	-	200	
7/21/97	15:00	14553	39°57	14475	39°58	212							
	43298	71°01	43292	70°46	204		320	20	100	15	1	200	
7/21/97	19:35	14474	39°58	14552	39°58	201							
4:00	43292	70°46	43299	71°01	210		180	20	75	10	2	150	

F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

15.

F/V MARY ELENA DEEP WATER SHRIMP TRAWLING 100 - 700 FTM.

[illegible]

Appendix V

Landing and Price Sheets by Trip

The following landing and price sheets are from the Point Judith Fisherman's Co., the buyer of the trips. The trips are complete with the exception of Trip #1, #2, and #9 during which no significant catch was landed.

The printout from each trip is self explanatory. A discussion on the marketing and price can be found at the end of Section IV, The Approach. Note that the Whiting are described as "Big Eye" in most cases, referring to species of Silver Hake, *Merluccius Albidis*, caught in deep water. A "King" Whiting is one that is 17" or longer. A #1 Whiting is 12"-17".

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730
(401) 782-1500

275
*PURCHASE 62228 06/23/96 1

06/24/96

PURCH FROM

XXXXX F/V MARY ELENA
XXXXX HAROLD LOFTES JR
271 CONGDON DRIVE
WAKEFIELD, RI 02879
(401) 783-3856

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730

LARRY

Prepaid XXXXXXXXXXXX Check 06/23/96 FOB DESTINATION

935.00	3100111D	Whiting Big Eye - #1 100#	LB	0.40	374.00
200.00	3100115B	Whiting Big Eye - King 50#	LB	0.80	160.00
50.00	4010112D	Angler - LGE 100#	LB	1.75	87.50
30.00	47301120	Red Fish - LGE 1b	LB	0.30	9.00
208.00	4010111D	Angler - SM 100#	LB	0.90	187.20
2.00	4760110D	TILE - SM 100#	LB	0.80	1.60
8150.00	11001100	Squid Illex 1b	LB	0.10	815.00
16.00	50001100	Shrimp - Head On (Fresh)	LB	3.50	56.00
16.00	50001400	Shrimp - Head Off (Fresh)	LB	4.00	64.00

#28

Thank you for your business.

1,754.30

Net 1 Day.

4

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730
(401) 782-1500

*PURCHASE 62411 07/06/96 1

07/07/96

PURCH FROM

XXXXX F/V MARY ELENA
XXXXX HAROLD LOFTES JR
271 CONGDON DRIVE
WAKEFIELD, RI 02879
(401) 783-3856

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730

Orlando

Prepaid XXXXXXXXXXXX Check 07/06/96 FOB DESTINATION

100.00	4010111D	Angler - SM 100#	LB	0.90	90.00
67.00	4010112D	Angler - LGE 100#	LB	1.75	117.25
12.00	4550110D	Hake - CUT 100#	LB	0.35	4.20
388.00	3100111D	Whiting Big Eye - #1 100#	LB	0.65	252.20
45.00	3100115D	Whiting Big Eye - King 100#	LB	1.00	45.00
40.00	4710112D	Jon Dory - LGE 100#	LB	0.50	20.00
1.00	4730112D	Red Fish - LGE 1b	LB	0.40	0.40
380.00	50001100	Shrimp - Head On (Fresh)	LB	3.00	1,140.00
180.00	50001100	Shrimp - Head On (Fresh)	LB	3.00	540.00
30.00	50001400	Shrimp - Head Off (Fresh)	LB	3.50	105.00
8450.00	11001100	Squid Illex 1b	LB	0.10	845.00

B28

Thank you for your business.

3,159.05

Net 1 Day.

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730
(401) 782-1500

*PURCHASE 62650 07/24/96 1

07/25/96

PURCH FROM

XXXXX F/V MARY ELENA
XXXXX HAROLD LOFTES JR
271 CONGDON DRIVE
WAKEFIELD, RI 02879
(401) 783-3856

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730

ORLANDO

Prepaid XXXXXXXXXX Check 07/24/96 FOB DESTINATION

2085.00	50001130	Shrimp LGE - Head on (Fresh)	LB	2.70	5,629.50
1185.00	50001100	Shrimp - Head On (Fresh)	LB	2.00	2,370.00
1500.00	3100111D	Whiting Big Eye - #1 100#	LB	0.20	300.00
350.00	3100115B	Whiting Big Eye - King 50#	LB	0.35	122.50
600.00	4010111D	Angler - SM 100#	LB	0.90	540.00
150.00	4010112D	Angler - LGE 100#	LB	1.75	262.50
2.00	4500111D	Ling - #1 100#	LB	0.07	0.14
6.00	49991100	Wolf Fish 1b	LB	0.50	3.00

28

Thank you for your business.

9,227.64

Net 1 Day.

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730
(401) 782-1500

#6
*PURCHASE 62774 08/01/96 1

08/02/96

PURCH FROM

XXXXX F/V MARY ELENA
XXXXX HAROLD LOFTES JR
271 CONGDON DRIVE
WAKEFIELD, RI 02879
(401) 783-3856

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730

JOHN

Prepaid XXXXXXXXXXXX Check 08/01/96 FOB DESTINATION

1470.00	50001130	Shrimp LGE - Head on (Fresh)	LB	2.75	4,042.50
960.00	50001100	Shrimp - Head On (Fresh)	LB	2.00	1,920.00
205.00	4010112D	Angler - LGE 100#	LB	1.75	358.75
1250.00	3100111D	Whiting Big Eye - #1 100#	LB	0.45	562.50
150.00	3100115B	Whiting Big Eye - King 50#	LB	0.80	120.00
2.00	4500111D	Ling - #1 100#	LB	0.15	0.30

#28

Thank you for your business.

7,004.05

Net 1 Day.

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730
(401) 782-1500

*PURCHASE 63018 08/21/96 1

08/22/96

PURCH FROM

XXXXX F/V MARY ELENA
XXXXX HAROLD LOFTES JR
271 CONGDON DRIVE
WAKEFIELD, RI 02879
(401) 783-3856

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730

Orlando

Prepaid XXXXXXXXXX Check 08/21/96 FOB DESTINATION

930.00	50001100	Shrimp - Head On (Fresh)	LB	2.10	1,953.00
1680.00	50001130	Shrimp LGE - Head on (Fresh)	LB	2.90	4,872.00
608.00	3100111D	Whiting Big Eye - #1 100#	LB	0.45	273.60
40.00	3100115D	Whiting Big Eye - King 100#	LB	0.55	22.00
166.00	4010111D	Angler - SM 100#	LB	0.90	149.40
61.00	4010112D	Angler - LGE 100#	LB	1.80	109.80

boat #28

Thank you for your business.

7,379.80

Net 1 Day.

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730
(401) 782-1500

*PURCHASE 63071 08/26/96 1

08/27/96

PURCH FROM

XXXXX F/V MARY ELENA
XXXXX HAROLD LOFTES JR
271 CONGDON DRIVE
WAKEFIELD, RI 02879
(401) 783-3856

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730

Juan

Prepaid XXXXXXXXXXXX Check 08/26/96 FOB DESTINATION

135.00	3100115D	Whiting Big Eye - King 100#	LB	0.40	54.00
6.00	4010112D	Angler - LGE 100#	LB	1.80	10.80
86.00	4010111D	Angler - SM 100#	LB	0.90	77.40
540.00	50001100	Shrimp - Head On (Fresh)	LB	2.10	1,134.00
525.00	50001130	Shrimp LGE - Head on (Fresh)	LB	2.90	1,522.50
725.00	3100111D	Whiting Big Eye - #1 100#	LB	0.15	108.75

boat #28

Thank you for your business.

2,907.45

Net 1 Day.

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730
(401) 782-1500

16
*PURCHASE 67186 06/19/97 1

06/20/97

PURCH FROM

XXXXX F/V MARY ELENA
XXXXX HAROLD LOFTES JR
271 CONGDON DRIVE
WAKEFIELD, RI 02879
(401) 783-3856

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730

ORLAND

Prepaid XXXXXXXXXXXX Check 06/19/97 FOB DESTINATION

1440.00	50001130	Shrimp LGE - Head on (Fresh)	LB	3.00	4,320.00
2145.00	50001100	Shrimp - Head On (Fresh)	LB	2.00	4,290.00
30.00	50001100	Shrimp - Head On (Fresh)	LB	2.00	60.00
1006.00	3100111D	Whiting Big Eye - #1 100#	LB	0.10	100.60
28.00	47301110	Red Fish - MED 1b	LB	0.80	22.40
212.00	3100115B	Whiting Big Eye - King 50#	LB	0.25	53.00
120.00	4010111D	Angler - SM 100#	LB	1.05	126.00
175.00	4010112D	Angler - LGE 100#	LB	2.00	350.00

28

Thank you for your business.

9,322.00

Net 1 Day.

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730
(401) 782-1500

(11)
*PURCHASE 67335 06/25/97 1

06/26/97

PURCH FROM

XXXXX F/V MARY ELENA
XXXXX HAROLD LOFTES JR
271 CONGDON DRIVE
WAKEFIELD, RI 02879
(401) 783-3856

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730

JOHN

Prepaid XXXXXXXXXX Check 06/25/97 FOB DESTINATION

690.00	50001100	Shrimp - Head On (Fresh)	LB	2.00	1,380.00
630.00	50001130	Shrimp LGE - Head on (Fresh)	LB	3.15	1,984.50
110.00	4010111D	Angler - SM 100#	LB	1.10	121.00
3.00	47301110	Red Fish - MED 1b	LB	0.30	0.90
725.00	3100111D	Whiting Big Eye - #1 100#	LB	0.30	217.50
215.00	3100115B	Whiting Big Eye - King 50#	LB	0.35	75.25

#28

Thank you for your business.

3,779.15

Net 1 Day.

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730
(401) 782-1500

(2)
*PURCHASE 67479 07/02/97 1

07/03/97

PURCH FROM

XXXXX F/V MARY ELENA
XXXXX HAROLD LOFTES JR
271 CONGDON DRIVE
WAKEFIELD, RI 02879
(401) 783-3856

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730

JOHN

Prepaid XXXXXXXXXXXX Check 07/02/97 FOB DESTINATION

700.00	3100111D	Whiting Big Eye - #1 100#	LB	0.50	350.00
591.00	50001100	Shrimp - Head On (Fresh)	LB	2.00	1,182.00
774.00	50001130	Shrimp LGE - Head on (Fresh)	LB	3.30	2,554.20
154.00	4010111D	Angler - SM 100#	LB	1.10	169.40
65.00	4010112D	Angler - LGE 100#	LB	1.70	110.50
2.00	4500111D	Ling - #1 100#	LB	0.30	0.60
296.00	3100115B	Whiting Big Eye - King 50#	LB	0.50	148.00

#28

Thank you for your business.

4,514.70

Net 1 Day.

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730
(401) 782-1500

*PURCHASE 67479 07/02/97 1

07/03/97

PURCH FROM

XXXXX F/V MARY ELENA
XXXXX HAROLD LOFTES JR
271 CONGDON DRIVE
WAKEFIELD, RI 02879
(401) 783-3856

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730

JOHN

Prepaid XXXXXXXXXX Check 07/02/97 FOB DESTINATION

700.00	3100111D	Whiting Big Eye - #1 100#	LB	0.50	350.00
591.00	50001100	Shrimp - Head On (Fresh)	LB	2.00	1,182.00
774.00	50001130	Shrimp LGE - Head on (Fresh)	LB	3.30	2,554.20
154.00	4010111D	Angler - SM 100#	LB	1.10	169.40
65.00	4010112D	Angler - LGE 100#	LB	1.70	110.50
2.00	4500111D	Ling - #1 100#	LB	0.30	0.60
296.00	3100115B	Whiting Big Eye - King 50#	LB	0.50	148.00

#28

Thank you for your business.

4,514.70

Net 1 Day.

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730
(401) 782-1500

13
*PURCHASE 67605 07/09/97 1

07/10/97

PURCH FROM

XXXXX F/V MARY ELENA
XXXXX HAROLD LOFTES JR
271 CONGDON DRIVE
WAKEFIELD, RI 02879
(401) 783-3856

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730

JOHN

Prepaid XXXXXXXXXXXX Check 07/09/97 FOB DESTINATION

1035.00	50001130	Shrimp LGE - Head on (Fresh)	LB	3.25	3,363.75
1125.00	50001100	Shrimp - Head On (Fresh)	LB	2.05	2,306.25
290.00	3100111D	Whiting Big Eye - #1 100#	LB	0.90	261.00
100.00	3100115B	Whiting Big Eye - King 50#	LB	1.00	100.00
150.00	4010111D	Angler - SM 100#	LB	1.05	157.50

#28

Thank you for your business.

6,188.50

Net 1 Day.

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730
(401) 782-1500

147
*PURCHASE 67704 07/16/97 1

07/17/97

PURCH FROM

XXXXX F/V MARY ELENA
XXXXX HAROLD LOFTES JR
271 CONGDON DRIVE
WAKEFIELD, RI 02879
(401) 783-3856

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730

JOHN

Prepaid XXXXXXXXXXXX Check 07/16/97 FOB DESTINATION

1170.00	50001130	Shrimp LGE - Head on (Fresh)	LB	3.25	3,802.50
930.00	50001100	Shrimp - Head On (Fresh)	LB	2.05	1,906.50
88.00	4010111D	Angler - SM 100#	LB	1.05	92.40
20.00	4010112D	Angler - LGE 100#	LB	1.70	34.00
700.00	3100111D	Whiting Big Eye - #1 100#	LB	0.20	140.00
250.00	3100115B	Whiting Big Eye - King 50#	LB	0.30	75.00

#28

Thank you for your business.

6,050.40

Net 1 Day.

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730
(401) 782-1500

15
*PURCHASE 67852 07/23/97 1

07/24/97

PURCH FROM

XXXXX F/V MARY ELENA
XXXXX HAROLD LOFTES JR
271 CONGDON DRIVE
WAKEFIELD, RI 02879
(401) 783-3856

Point Judith Fishermen's Co.
75 State Street - PO Box 730
Narragansett, RI 02882-0730

CARL

Prepaid XXXXXXXXXX Check 07/23/97 FOB DESTINATION

690.00	50001130	Shrimp LGE - Head on (Fresh)	LB	3.25	2,242.50
790.00	50001100	Shrimp - Head On (Fresh)	LB	2.05	1,619.50
50.00	4010112D	Angler - LGE 100#	LB	1.75	87.50
180.00	4010111D	Angler - SM 100#	LB	1.05	189.00
12.00	4020112D	Bluefish - LGE 100#	LB	0.30	3.60
800.00	3100111D	Whiting Big Eye - #1 100#	LB	0.55	440.00
150.00	3100115B	Whiting Big Eye - King 50#	LB	0.75	112.50
300.00	0100113D	Squid Loligo - REG 100#	LB	0.75	225.00
40.00	0100114C	Squid Loligo - LGE 100#	LB	1.15	46.00
8.00	4110111D	Fluke - MED 100#	LB	1.75	14.00
12.00	4110112D	Fluke - LGE 100#	LB	2.25	27.00
10.00	4110113D	Fluke - JO 100#	LB	2.75	27.50

28

Thank you for your business.

5,034.10

Net 1 Day.

Appendix VI

Deep Water Species By-Catch

During the exploratory tows, a number of species unknown to Captain Loftes and the crew were brought up. Enclosed in the Appendix is a letter from Nancy Balcom of the Connecticut Sea Grant Marine Advisory Program. The fish listed in Nancy's letter were not caught in any quantity during the project, with the exception of the Royal Red Shrimp. Further exploration may find some of these species in commercial quantities. An example of the appearance and size of some of the species caught can be seen in the enclosed photographs.

UNIVERSITY OF CONNECTICUT

SEA GRANT MARINE ADVISORY PROGRAM

TO: Captain Harold Loftes
FROM: Nancy Balcom, CT Sea Grant
DATE: March 27, 1996
RE: Identification of trawl catch

I picked up your samples last week and have identified 95% of them. I will try to finish the rest soon. These are all new to me and so it takes me a while to key them out. I will send you copies of line drawings of some of the fish, so that you can put names and faces together.

Fish:

White hake *Urophycis tenuis*
Barndoor skate (egg cases) *Raja laevis*
Black Dogfish *Centroscyllium fabricii*
Longnose chimaera *Harriotta raleighana*
Roundnose or Rock Grenadier *Coryphaenoides rupestris*
Greenland halibut *Reinhardtius hippoglossoides*
Slatjaw cutthroat eel *Synaphobranchus kaupi*
Trigonolampa miriceps
Longtooth anglemouth *Gonostoma elongatum*
Bigeye Smoothhead *Bajacalifornia megalops*

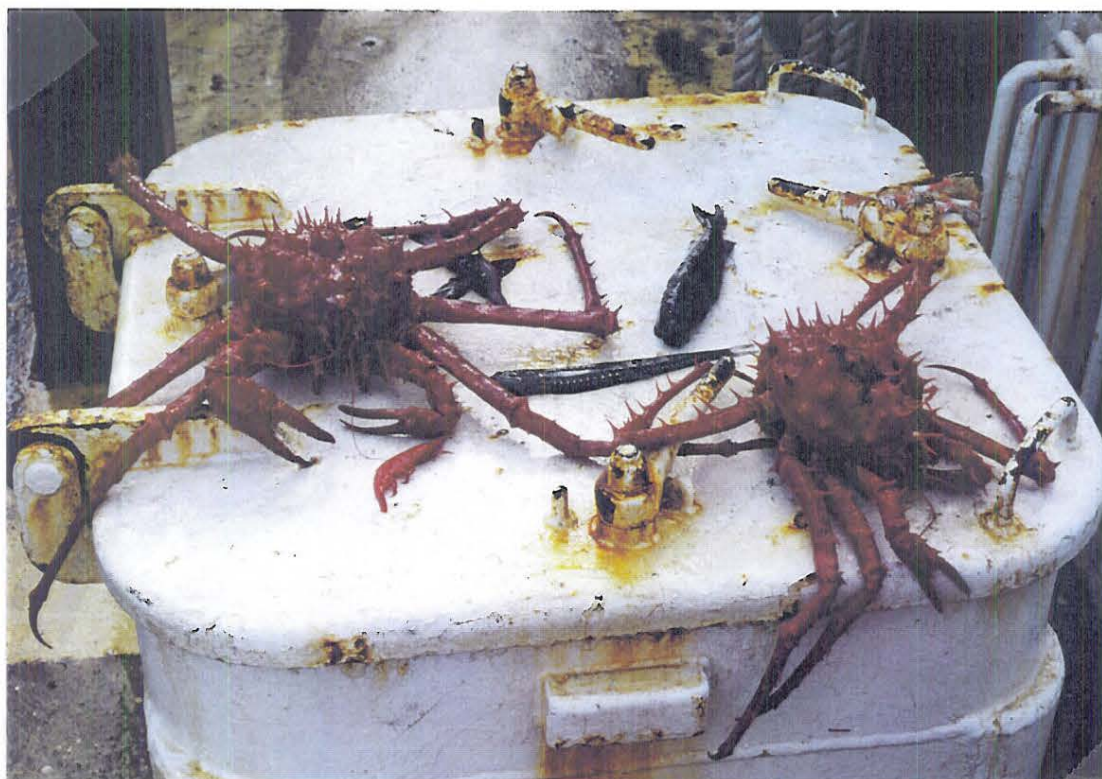
Crabs/Shrimp:

Scarlet shrimp *Plesiopenaeus edwardsianus*
Royal red shrimp *Pleoticus robustus*
Stone porcupine crab *Neolithodes grimaldi*





From Left to Right: Black Dogfish (*Centroscyllium fabricii*), Longnose Chimaera (*Harriotta raleighana*), Roundnose or Rock Grenadier (*Coryphaenoides rupestris*)



Stone Porcupine Crab (*Neolithodes grimaldi*)



Greenland Halibut (*Reinhardtius Hippoglossoides*)