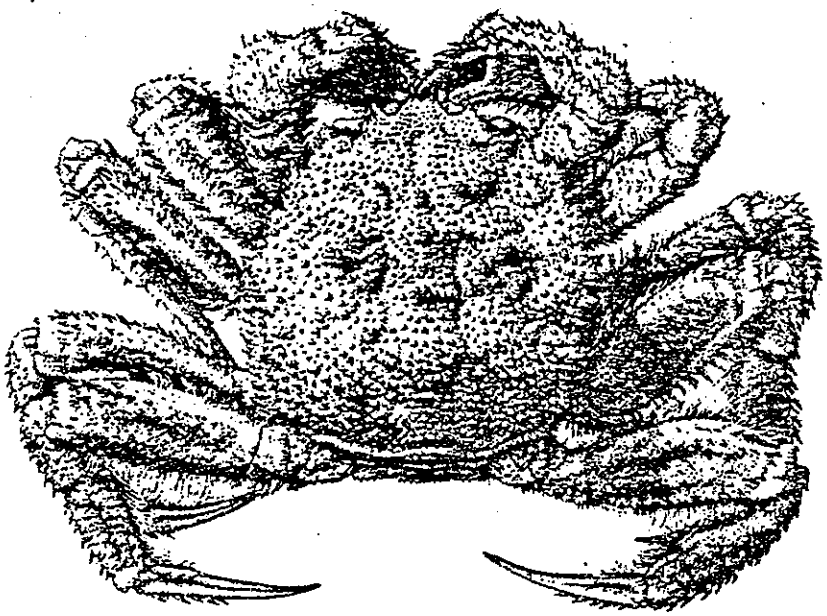
PRIBILOF ISLAND HAIR CRAB PROJECT



Preface

Fisheries development is more than a catch phrase to the people of the Pribilof Islands. It is perhaps the harbinger of a new basic industry. Current political rumblings have threatened the only basic industry on the islands, that being the yearly fur seal harvest. Budget restraints imposed by current administrative policy further limit the options for "fostering self-sufficiency" as mandated by the Fur Seal Act of 1966, 16 U.S.C. 1151 (PL 89-702).

Saltonstall-Kennedy Project No. 80-ABD-00019 was an attempt to provide financial assistance to an innovative group of fishermen to harvest and market a high value but 'underutilized' species of crab, Erimacrus isenbeckii. Success of a project of this nature can be gauged by several factors. First, quantitatively, the fishery has grown from a total annual harvest in 1980 of approximately 60,000 pounds to approximately 1,500,000 pounds in 1981 (to date). The second part of the fisheries development equation in this case is the degree of regional economic multipliers engendered by this new fishery. Unfortunately, the system breaks down here and what has evolved is an extractive resource being moved from the Pribilof area to an area where it can be more easily unloaded and prepared for shipment. To date, there is great interest in this resource but its exploitation has been primarily by those with the fishing infrastructure capable of harvesting and transporting the product. Aspiring fishermen on the Pribilofs continue to search for options on how to best avail themselves of this resource.

Saltonstall-Kennedy Project
No. 80-ABD-00019
Alaska Region - NMFS

FINAL REPORT
ON THE
PRIBILOF HAIR CRAB PROJECT
ST. PAUL ISLAND, ALASKA 99660

SUBMITTED BY

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St. Paul Island, Alaska 99660
January 14, 1981

TO:

National Marine Fisheries Service

TABLE OF CONTENTS

INTRODUCTION

The Pribilof Islands are a group of five islands located in the middle of the Bering Sea, approximately 250 air miles north of Dutch Harbor and 800 air miles west of Anchorage. Only two of the islands, St. George and St. Paul, are inhabited. St. Paul is the home of the largest Aleut population (509) who are located in a single place in the entire world.

The primary economic base in the Pribilofs is the federally managed northern fur seal harvest. The majority of local employment for both islands is seasonal, lasting an average of three months per year. Only 20 percent of the local residents hold near full time jobs on both islands. There are 108 Aleut households on St. Paul, with an average number of 4.7 people per household. The average household income on St. Paul is $15,300, with 30% of the households having yearly incomes of less than $10,000. These average income figures include unearned income such as food stamps, unemployment compensation, etc. HUD's current definition of a low income household of four is $14,000 per year. The situation is extremely similar on St. George.

Beginning in 1980, the National Marine Fisheries Service (which manages the fur seal program)began employment budget cutbacks at a time when fuel prices increased 269 percent from 1979 and electricity prices increased almost 100 percent. Coupled with inflation on goods and services, the economic plight of the Pribilovian is grim. Further employment cutbacks are presently being planned in 1981. This poses serious problems which are dramatized by the fact that the Pribilovians now owe over a quarter of a million dollars to the federal government in fuel bills; they owe over one hundred thousand dollars to the local store, with the prospect that these debts will increase as average household income diminishes - as it certainly is doing now.

The Corporation faces a difficult challenge to attempt local investments but to insure profitability. With limited investment opportunities, the Corporation turned to fisheries as a possible area of investment concentration. In line with this priority, St. Paul hosted a regional bottomfish conference in September, 1979. The conference sponsored by the State of Alaska and the Alaska Native Foundation, hosted 110 participants for four days. The participants were composed of federal, State and private industry fishery experts and Aleut village corporation representatives from Aleutian Chain villages.

At the end of the conference, the experts and the Aleut leaders concluded the following

1. It is unrealistic and presently inpractical for a majority of Aleut villages (as well as most of coastal Alaska) to invest in bottomfish boats competitively. This is primarily due to the present high risk of such an investment, the high cost of a boat capable of taking bottomfish, the inexperience of most coastal villages in fishing and management and the small capital village corporations have to invest in any project.

2. Only those villages with potential or developed natural harbors can expect to share in Alaska's bottomfishery in any meaningful way. This precludes participation by the majority of coastal villages except as a source of low cost labor.

3. Given the conclusions, individuals in coastal villages will migrate to fishery economic centers as domestic bottomfishing develops, resulting in gradual dissolution of small coastal villages into large centers and diluting the cultures

Following the conference, Tanadgusix Corporation began exploring fishery alternatives that may allow small coastal villages some participation in the fishing economy developing in their own back yards. Tanadgusix concluded that one potential is a small boat day fishery. We decided to pursue this alternative for its many potential benefits:

1. It would not require major developed harbor sites.
2. It would not require substantial capital.
3. It would not require major technical expertise.
4. It would not disrupt village lifestyle.
5. It would not require a major influx of transients into a village.
6. It would not require individuals to be away from home for extended periods of time.
7. It could be accessible to village corporations and individual residents of villages if its viability were proven, technology developed and financing instruments created.
8. It could provide additional income and jobs in a village.

In April, 1980, the President of this corporation met two men in Seattle who owned two small Bristol Bay gillnetters and were interested in fishing around St. Paul. An agreement was struck which required this corporation to provide supportive service to the boats and local crews in return for which, the two boat owners were to provide all information obtained during actual operation.

In June of 1980, the two small boats arrived via a fishing boat on its way south from Bristol Bay. Operations began one week later.

In July, 1980, the President of this corporation met with NMFS officials to attempt to procure funding assistance. After reviewing the project and a proposal submitted, NMFS agreed to provide a $10,000 minigrant.

PROJECT NARRATIVE

I. OPERATIONS DESCRIPTION

A. Boat Description

Two thirty-two foot 16 inch draft gillnetters were used in the project. The boats, owned by two individuals from Seattle, are of double hulled aluminum construction with a small pilot cabin aft and a pilot station on the bow. The ten-thousand pound crafts were equipped with dual gasoline engines for maneuverability.

The boats were only equipped with VHF and 40 channel CB. Although there were many fishable days in the summer months (see Addendum A of this report), operations were prevented due to lack of navigational equipment for use in fog.

B. Gear Description

Conical shaped, nylon webbed pots were used. The pots have a 4 foot base diameter, 3 foot top diameter and a height of 2½ feet from base to tunnel opening on top.

C. Fishing Techique

A long line system was used with approximately 50 pots per string, double buoyed and anchored at each end. The pots were attached to a ground line at approximately 18 foot intervals. Pots were set and recovered by hydraulically powered winch drums as the boat drifted with the tide. Pots were baited with 3 pound seal meat chunks and ground up meat for bait jars.

D. Daily Procedure Summary

The boats, crewed by two men each, had to be launched from a sand beach during high tide the evening prior to fishing and moored to a concrete dock in the west side landing overnight.

E. Fishing Location

All fishing occured within 2½ miles of shore in the Village Cove area west of the village. Normal travel time to the fishing grounds was less than twenty minutes. Further site exploration was not done because the chartered vessel Flying Cloud provided information that high concentrations existed in the site fished. NMFS trawl surveys indicate that similar concentrations of crab exist throughout the nearshore waters of the island, primarily in 18 to 20 fathoms of water from June to September.

F. Crab Handling Technique

The boats used during the fishing operation were not equipped with live holding tanks. The crabs taken from each individual pot were carefully emptied onto the deck of the boat and manually placed into an empty pot set aside to hold the day's catch. The number of holding pots used were dependent upon the quantity of crab caught. The crab would then be exposed to the prevailing weather conditions for a period up to ten hours.

Upon return of the boats to shore, the crab would be off loaded for holding into a live tank which was constructed on the dock. The tank was circular in design, five feet high, 4 feet in diameter and a maximum holding capacity of 4000 pounds of crab. A continuously running salt water pump was installed in the tank. Crab were held from one to three days, depending upon plane schedules.

G. Crab Packaging Technique

Four hours prior to scheduled arrival of the plane, the crab were packaged as follows:

1. Packing carton. A standard 100lb. wetlock salmon box was used. The boxes were airline approved for fresh seafood shipments.

2. Packing insulation. Cellulose fiber blankets and sawdust was used.

3. Packing method. Crab were individually packed into the cartons. The crab were layered three high and separated with a moist fiber blanket, with a total of 40 to 48 crab per box. The packaging methods were altered subsequently to a single layer of crab, 20 crab per box surrounded by prechilled sawdust.

H. Crab Shipment

During the fall of 1979, contacts were made with Reeve Aleutian Airways and two international carriers with routes from Anchorage to Japan. In the planned flight time, it was calculated that the crab would be in air transit for a period of 26 hours. Ambient temperature during shipment on Reeve was estimated to be 50° to 60° F. Upon arrival in Anchorage, a twelve hour waiting period was required prior to making the connecting flight to Japan. During this time, the cartons were held in a refrigerated container with a holding temperature of 39° F. When Flying Tigers were used for transport of crab to Japan, the cartons were held in the cargo holds with an ambient temperature between 40° to 50° F When Japan Airlines transported the cargo in containers, the ambient temperature was maintained at 32° F.

II. OPERATION RESULTS

A. Boat Design, Operating Characteristics

The boats were of adequate size in terms of gear storage and cargo capacity, but they are not suitably designed for the Pribilof waters. Wind conditions above twenty five knots or moderate seas were marginal safe operating conditions for this type of boat. An additional factor creating down time was the inability for the boats to operate during days of low visibility due to fog.

Moderate swells at the concrete dock prevented operation due to an inability to moor for purposes of off loading crab. With 3 to 6 foot swells, the mooring lines would take severe stress and the boat would be thrown violently against the dock causing hull damage and bursting buoys tied to the boats side. Oversiz tires were placed over the docks side but did little to cushion the boat.

B. Gear Effectiveness

The only comparison that can be made is to King Crab pots. When the two styles of pots were fished side by side, the conical pots fished equally as well or better. The CPUE changed as the project progressed, ranging from 12 pounds in mid June to 38 pounds in mid August. The difference is attributed to increased knowledge of crab locations, time intervals gear was checked and baiting techniq

C. Fishing Technique

The pots were allowed an average three day soak, retrieving an average of 9-12 crabs of an average weight of 900 grams each per pot. Due to inclement weather conditions, pots have soaked for as long as two weeks with no mentionable increase of crab per pot but also no visible ill effects on the captured crab.

D. Crab Handling Technique

The crab handling technique on board the boat did not prove to be a survival problem, however, it was apparent through visual observations that the longer the crab were held on deck the weaker they appeared to be. Interestingly, rainfall showed results of increased number of crabs which became weak in a shorter period compared to non-rain conditions.

E. Crab Holding Technique

The live tank with circulating salt water pumped directly from the sea proved to be an effective holding technique. Circulating water was necessary as demonstrated when the pumps clogged and there was a dramatic rise in mortality due to noncirculation of water.

F. Crab Packaging and Shipment Technique

The following table shows the results of 5 shipments of live crab to Tokyo. Following the table is a narrative explaining conditions that existed during each shipment.

Shipment #	Date Shipped	Date Received	Quantity Shipped	Mortality	Transp Cost
1	6/28/80	6/30/80	39 Kgs	100%	$395.5
2	7/7/80	7/9/80	33.5 Kgs	100%	$366.0
3	7/16/80	7/18/80	68.5 Kgs.	50%	$536.0
4	7/23/80	7/25/80	610 Kgs.	100%	$2641.
5	8/5/80	8/8/80	107.5 Kgs.	40%	$1098.

Shipment 1 & 2: Shipped with extensive moisture in cartons. Refrigerated at 32° F overnight on island. Not refrigerated from island to Tokyo.

Shipment 3 : Shipped with little moisture in cartons. Placed in moisturized sawdust and seaweed. Refrigerated overnight and from Anchorage to Tokyo.

Shipment 4 : Shipped with little moisture in packs. Packaged with dry, prechilled sawdust and newspaper. Refrigerated overnight and from Anchorage to Tokyo. Multiple handling of cartons due to unscheduled off loading and reloading at Cold Bay.

Shipment 5 : Shipped with little moisture in packs. Packed with prechilled dry sawdust and newspaper, with gel packs in some boxes. Information received did not indicate mortality rates of boxes with and without gel ice.

It appeared that using one layer of crab and sawdust proved to be the most effective

method of shipment. Multilayered crab increased temperature and moisture in the cartons, causing mortality.

III. OPERATIONS ANALYSES AND RECOMMENDATIONS

A. Boat Construction and Equipment

Analysis:

1. Down time was unreasonable due to:
   a. Engine failure and lack of repair parts on hand.
   b. Limited visibility due to fog.
   c. Swells from 3' to 6' alongside the dock, making it extremely difficult if not impossible to moor and offload cargo.
   d. Wind conditions in excess of 25 knots which made operating conditions marginally safe in moderate seas.
2. Time was wasted in searching for pots due to lack of navigation aids even during good conditions.
3. The island has two basic landings - the east and the west. Frequently the east landing would be operable; however, the boats could not operate there since they would be tied up on the west landing unable to move in the marginal west landing operating conditions.
4. Deckspace of the craft proved adequate; however, the manner of storing crabs on board required manual offloading, resulting in more time inefficiency. In addition, mortality of crab increased due to exposure to the elements under certain conditions, particularly rain.
5. The dual gasoline engines proved effective for maneuvering as pots are set and recovered and when mooring next to the concrete dock. Boat speed was good but proved not to be a necessity, given location of crab concentrations. Use of gasoline engines proved costly and are relatively dangerous to operate.
6. On board navigation equipment was lacking. CB and VHF communications adequate.
7. Hydraulic winch drums proved effective for launching and recovering pots on a ground line.

RECOMMENDATIONS:

1. If new boats are to be constructed, down time may be decreased by:
   a. Installation of the more reliable and safe diesel engines. Dual engines are a necessity.
   b. Keep on hand spare parts that are most likely to be needed.
   c. Installation of radar and LORAN to allow operation in fog and quick location of crab pots.
   d. Install mooring dolphins alongside dock to allow docking to offload during periods of sea swells, or provide an extended conveyer alongside dock, or offload crab at sea. To keep costs down, increase efficiency and decrease handling of crab, the extended conveyer and/or mooring dolphins may be the most practical solution.
   e. Boats should be designed to operate safely in moderate seas and wind conditions up to 35 knots minimum in exposed waters.
2. Construct boat trailers to transport boats to the other landing when its conditions are operable. A concrete boat ways would be required on the east and west landings if this method is used. In lieu of such boat ways,

a large mobile crane could lift boats in and out of the water.

3. Boats should be constructed with circulating sea water holding tanks if practical. At a minimum, crab should be stored in large coverable boxes which could be removed from the boat by a dockside winch.

4. A better system of pumping fuel onboard is required. The present method requires transport of a 50 gallon drum to the mooring location and manually pumping fuel onboard.

5. A 40 channel CB, VHF, and marine radio should be installed on any boat operating from St. Paul.

6. Boats must have hydraulic winch drums and a davit on deck if the ground line method is to be used.

B. Crab Handling Technique

Analysis:

1. The present method of handling crab on deck is inadequate and causes hazardous deck clutter.
2. Exposure to elements increase mortality with time and conditions.

RECOMMENDATIONS:

1. See recommendation A-3.

Analysis:

1. The present method is inadequate in terms of tank sizes, reliability of circulati pumps and motors and temperature control. The pumps clogged frequently, requirin constant monitoring if crab mortality was to be kept at a minimum.

2. The system did not allow for pumping fresh salt water in and old water out, resulting in some increase in ambient temperature.

3. The tanks were exposed to rain, other elements and harrassment of the crab by children on the dock and resulted in increased mortality.

RECOMMENDATIONS:

1. Increase tank sizes and build more tanks.

2. Keep standby pump motors on hand.

3. Develop a more efficient pump filtering system, and

4. Install a refrigeration system on the tanks to control ambient temperature, or

5. Consider placing holding taks inside a refrigerated room to control ambient temperature.

D. Crab Packaging and Shipment Technique

Analysis:

1. The first packaging method used with 3 crab layers in wetlock boxes, moisturized sawdust, kelp and newspapers proved gravely inadequate.

2. Single layered crab reduced mortality.

3. Prechilling sawdust and use of gel ice with minimization of moisture proved the most effective in reducing crab mortality.

4. Keeping crab in refrigeration during transport to market increased survivability of the crab.

RECOMMENDATIONS:

1. Use expert Japanese technicians to advise on packaging techniques. The technicians provided such advice to St. George and were able to obtain up to 100% survival of crab.

2. Based on Japanese advice, use styrofoam containers with a single layer of crab placed vertically in the box with the head facing up.

3. Keep ambient moisture contents to a minimum.

4. Use only aircraft with refrigeration capability during transport.

E. Crab Pot Construction, Setting, Soaking

Analysis:

1. The crab pots used were too high from base to top. Slope of pot from base to top is too steep. Entrance of pot too large. Hair crab are lively and probably escape ocassionally from present pot type.

2. The average soaking time of the pots was three days, resulting in an average of 12 crab per pot. The pots were set 3 fathoms apart on the ground line laid in the direction of the tide. No other method was tried; i.e., spacing between pots, time of soak.

3. Seal meat in chunks or ground up proved comparable to if not better than herring. The seal meat lasted longer in the pots than herring.

RECOMMENDATIONS:

1. Decrease slope of pot from base to top.
2. Decrease pot entrance size.
3. Experiment with side door to pot.
4. Experiment with different spacing of pots on ground line.
5. Experiment with different soak times.
6. Maintain use of seal meat which is cheap and easily accessible.

F. Crab Concentrations and Migratory Patterns

Analysis:

1. Crab appear to be concentrated heavily offshore to the shoreline in the west side. No experimentation was made in any other area.

2. CPUE ranged from 12 pounds to 38 pounds. This variance is not due to the

season but rather to experience and technique of catching which was improved.

3. Crab begin to migrate out by late September to deeper waters.

RECOMMENDATION:

1. Scientific studies are mandatory to determine maximum sustainable yield, specific migratory patterns, concentrations, reproductive capacity, molting periods and total biomass in the immediate vicinity. These items become particularly critical in light of increased interest in hair crab by large commercial fishing boats. At this writing, four 120 foot crabbers are planning to fish hair crab during tanner season. One boat already shipped 7,000 of crab from St. George waters.

2. Consider efforts to limit size of boats allowed to fish hair crab until scientific is developed. The size should be set so that open sea commerical boats cannot fish the Pribilof waters until data is developed and a reasonable quota is set. Overfishing may result unless such action is taken soon.

PROJECT CHRONOLOGY

June 14

Boats arrive in St. Paul

June 5 - 14

Vessel repair
Gear preparation

June 15 - 17

Exploratory fishing with individual pots
(15 pots used - 10 pots lost)

June 18 - 21

Analysis of gear effectiveness
Location of crab concentrations
Consultation with F/V Flying Cloud skipper
Rearrangement of fishing method

June 22 - 25

Set and hauled longline gear three times
Moving gear according to density of crab

June 26 - 27

Experimentation on crab survival in refrigerated box environment

June 28

First shipment of live crab

June 29 - 30

Awaiting results of first shipment
Construction of first live tank

July 1 - 4

Construction of second live tank
Awaiting additional information on possible ways of shipping live crab
(Shin Hishoku Ltd.)

July 5

C. Cetak departs St. Paul
Meeting with Larry Merculieff

July 6

Set more gear
Fishing approximately 100 pots

July 7

Second shipment

July 8 - 9

Awaiting results from second shipment

July 10 - 15

Waiting for sawdust from Anchorage
Set additional gear
Problems with moorage -- L.C.M. was moved to the beach

July 16

Third shipment with sawdust

July 17 - 18

Waiting for results on third shipment
Waiting for more sawdust

July 19 - 22

Constructed larger live tank
Live tank capacity 4,000 lbs., filled live tank with one lift of gear
Preparing boxes for fourth shipment

July 23

Fourth shipment of 610 kgs. crab

July 24 - 25

Awaiting results of fourth shipment

July 26 - 31

Moorage facilities hampered fishing operations
Discussed logistics with Larry Merculieff
Scheduling M. Morin's trip to Japan

August 1

Hauled gear to provide adequate crab for fifth shipment

August 2

M. Morin departed St. Paul for Anchorage
Live tank pump problems

August 3

Live tank of crabs all dead, pump inoperative

August 4

Scott Dilly hauled gear
Kept crabs in pots to keep alive

August 5

Fifth shipment
Plane delayed, shipment was made without Scott Dilly's knowledge, plane left late
M. Morin unaware of shipment, lack of proper communication

August 6

M. Morin in Anchorage awaiting notification of shipment
Afternoon - M. Morin informed of shipment
Shipment passed through Anchorage to Tokyo without M. Morin's knowledge--no communication, lack of responsible personnel on St. Paul

August 7 - 9

M. Morin in Anchorage awaiting next shipment from St. Paul

August 10

M. Morin departs Anchorage for Tokyo

August 11 - 13

M. Morin in Tokyo discussing past shipments and logistic problems

August 14

M. Morin returns to St. Paul
Live tank pump inoperative

August 15 - 18

Pick up gear--approximately 3,000 lbs. Released some, gave balance to St. Paul residents and restaurant
Stow gear
Prepare for departure
Meetings with Larry Merculieff and all participants in project to discuss project, problems, results, etc.

August 19

M. Morin and Scott Dilly depart St. Paul

TOTAL IN KIND CONTRIBUTION	$4,793.00
TOTAL ALL EXPENSES - 2 BOATS	$41,455.55

* VI MARKET ANALYSIS

A. The market price for live hair crab varies from $3 to $6 per pound, depending on quality, size and time of sale.

1. Quality factor: The lightest colored male crab obtains the highest price. Physical condition of crab (liveliness) is also a factor.

2. Size factor: 1000 gram size male crab obtain the highest price.

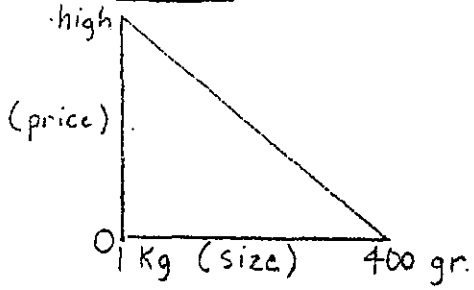
3. Season factor: December is the month of highest price and demand. Reasonably high prices are maintained from November through January. Price drops dramatically as demand drops, beginning in March and ending in May. The price raises moderately in June and is maintained through September. Prices increase again in October. No crabs are taken during molting season.

4. Price factor: The largest sized (1000 gram), light colored male obtains the premium price of any other hair crab in any given season, with the maximum price for the year obtained in December.

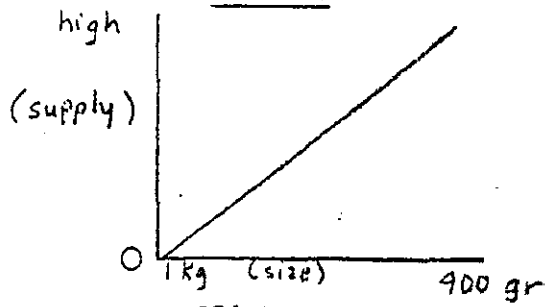
B. The market characteristics are shown graphically below:

LIVE CRAB

GRAPH 1



GRAPH 2



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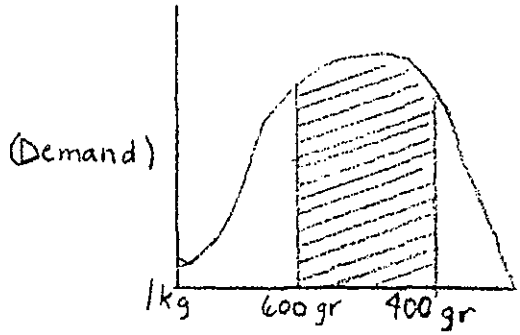

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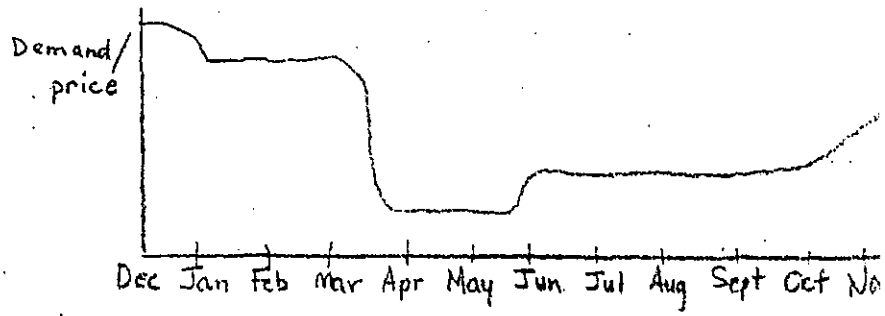
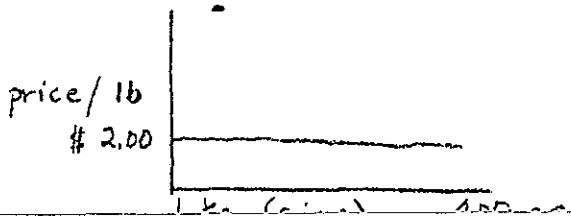
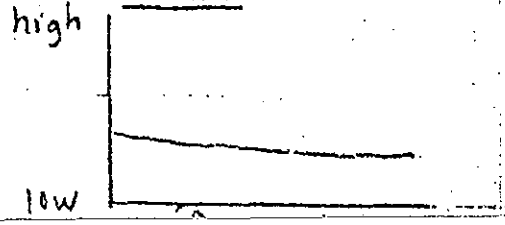


GRAPH 5



GRAPH 6



V. Cost ANALYSIS - ACTUAL

A. Equipment and Gear

1. Boats valued at $80,000 amortized over 10 years	$8,000.00
*2. 400 pots and lines	$9,552.00
3. CB and VHF @ $500 amortized over 3 years	$ 267.00
TOTAL EQUIPMENT AND GEAR	* 17,819.00

B. Transportation

1. Boat operator airfares 3x 460.65	$1,381.95
2. Boat transport from Norton Sound to St. Paul	$3,940.00
3. Boat transport from St. Paul to Seattle	$7,000.00
TOTAL TRANSPORTATION	$10,940.00

C. Maintenance

1. Props, ignition parts, oil filters, freight	$ 550.00

D. Insurance

1. $600/boat for crab fishing operation	$1,200.00
2. $600/boat shipping insurance	1,200.00
TOTAL INSURANCE	$2,400.00

E. Fuel

300 gallons at .96/gal.	$ 288.00

F. Administrative Support

1. Telephone, telegram	$ 400.00

G. Licensing and Bonding	$ 160.00
H. Product Packing material, boxes, liners	$4,105.55

I. Tanadqusix in-kind Contribution

1. Vehicle fuel, 50 gal. @ .96/gal	$ 48.00
2. Housing, 3 people x 59 days @ $10/day	$ 590.00
3. Food, 3 people x 3 meals/day @ 5.00/meal x 59 days	$2,655.00
4. Storage of gear and supplies	$ 500.00
5. Cash for travel to Japan 1 person	$1,000.00

GRAPH 1: Indicates that the highest price is obtained for the 1 kg. size, provided that it is the proper light color. The darker colored 1 kg. crab obtain a higher price than lower weight crab but less than the lighter colored 1 kg. crab. Price drops dramatically the lower the crab weight.

GRAPH 2: Indicates that in Japan market, the available quantities of crab per given weight increases as the weight decreases, with the least supply of 1 kg. crab.

GRAPH 3: Indicates the demand curve per given weight. The greatest demand for crab between 400 to 600 grams. Demand is low for 1 kg. crab but the price is high.

GRAPH 4: Indicates the demand/price curve for hair crab by month, with the peak months being December through February, then a dip which partially recovers in June and rises again in October.

GRAPH 5: Indicates an inflexible price curve at $2 per pound for boiled-frozen crab.

GRAPH 6: Indicates a declining demand for boiled-frozen crab.

* NOTE: Market information obtained from two sources:

Shin Nishoku Co., Ltd., broker from Japan, and Marudui Seafoods Co. Ltd., Wholesalers and hair crab processors from Japan

VII. PROJECT CONCLUSIONS

Overall, we consider the project highly successful in terms of our gain in knowledge of and experience with hair crab fishing. We have resolved numerous problems (including air transportation costs which we have negotiated down from .23/lb. to .14/lb. from St. Paul to Anchorage), and we have a good understanding of problems which need to be overcome.

In addition, the training of two local men on this project will greatly assist us should we decide to go forward with a more agressive and better planned project. The training consisted of:

1. Crab pot use and bait setting
2. Crab pot setting
3. Boat handling and operation
4. Live crab storage
5. Live crab packing and shipping
6. Boat mooring techniques
7. Boating safety

In addition, a seminar was held on all facets of hair crab fishing. The seminar was attended by 6 local individuals. Topics covered in the seminar were:

1. Construction of hair crab pots
2. Use of pots, baiting, gear
3. Boat techniques in setting pots
4. Care of live crab
5. Shipment of live crab
6. Problems with existing operation
7. Hair crab markets

We believe that we now have sufficient information to reliably catch, hold and ship hair crab with mortality of no more than 20 percent. We have solved the problem of holding hair crab in the event of plane delay due to weather without significant mortality.

VIII. PROJECT FOLLOW UP

The Corporation is encouraged by the potential of a hair crab fishery as an economicall feasible project, having proven that the major problems are resolvable. To further our goals in this area, we have retained a fishery development consultant firm from Seattle to do a feasibility analysis. The contract with the firm specifies that if feasibility is demonstrated, they are to develop a total operations plan, including boat design specs, equipment and gear specs, fishing techniques, processing techniques, quality control monitoring procedures and standards, training requirements and specifications, personnel requirements and an operations manual.

We are planning to explore expansion of the fishery to include cod and/or squid, as well as halibut. Corporation representatives will go to Vancouver, B.C. for a hearing before the International Halibut Commission to advocate a summer fishery for halibut in the Pribilof waters.

We will be encouraging NMFS to launch a comprehensive hair crab assessment program to develop data necessary for proper management of the specie.

In addition, we will be seriously examining the possibility of urging a vessel size limitation for the fishery pending completion of study activities.

FINAL COMMENTS

Two points make the analysis of a Korean hair crab fishery (Erimacrus isenbeckii a significant pursuit:

1. NMFS scientists believe that Korean hair crab could provide a viable fishery in the Pribilof fishing district (as delineated by ADF&G regulations) as more than 50% of the eastern Bering sea population is located there. According to NMFS data, if fished at the 40% harvest rate applied to other crab species, the hair crab resource could provide an annual yield of 6-8 million pounds.

2. In Japan, Korean hair crab called "Ke-gani" is highly marketable as a live product. Current Japanese domestic production consists of about 10 mt/day being caught off Hokkaido. Ninety percent of these domestically caught crab are transported live to fish markets throughout Japan including 3 mt/day to the Tokyo fish market. The remaining 10% is frozen and commands a much lower price. Market preference is for larger size crab with the most popular size being crab that weigh about 800 grams. This size commands a wholesale price in the range of yen 1,400 - 4,000/kilo ($6.73 - $19.20). Information indicates that the Japanese market could absorb an additional 15 mt/week from sources other than their domestic fishery.

This particular study provided much insight into the logistics of small boat harvesting and air transhipping of live hair crab to the Japanese market place. It should be noted that the technical reviews of the project were generally good, but the following weak points were identified:

(1) Catch-per-unit-effort data needs to be elaborated upon:

(2) The transportation costs as provided; appear illogical in the price/lb breakdown (e.g., price fluctuates between $1.96/lb and $4.96/lb). Consistency of price formulation is essential in any long term marketing plan.

RECOMMENDATIONS:

1. Re-design pots more in line with Japanese style (see attached).

2. Explore possibility of using 'live' holding tanks and floating pens for holding large numbers of crabs.

3. Other shipment modalities should be explored such as using styrofoam lined cardboard boxes with sealed plastic liners gassed with 100% 0_2 (300 mm Hg) -- two atmospheres.

4. Research projects to study migrational patterns, growth rates and molting periods would add significantly to OY determinations for the specie.

5. Maintain a flow of information (i.e. technology transfer) between those parties interested in developing this resource.

In summary, this project opened a number of doors that could lead to economic opportunity for the Pribilovians. The most salient problem of the high moralities resulting during air shipments to Japan and subsequent loss of profits will no doubt be mitigated by time and experience.

This manuscript was read by Hank Pennington, Alaska Marine Advisory Program; Therese Arnetta, National Marine Fisheries Service, Kodiak Lab, and Tony Mecklenburg of the Alaska Department of Commerce and Economic Development. Their advice and comments are gratefully acknowledged by the National Marine Fisheries Service, Fisheries Utilization and Development Division, and Technical Monitor, H. Terry Elwell.

ADDENDUM A

		WIND DIRECTION	FASTEST MPH	AVERGAE MPH *1	FOG VISIBILITY ¼ MILE	MAXIMUM 32 F & BELOW	MINIMUM 32 F & BELOW
1975	March - Oct	019 (NNE)	40	16	9	6	14
	Nov - Feb	010 (N)	48	21	3	15	27
1976	March - Oct	016 (NNE)	38	17	10	8	14
	Nov - Feb	005 (N)	50	15	3	18	27
1977	March - Oct	016 (NNE)	39	16	6	4	11
	Nov - Feb	014 (NNE)	54	22	2	10	23
1978	March - Oct	022 (NNE)	38	No Data	6	3	8
	Nov - Feb	019 (NNE)	48	No Data	1	5	17
1979	March - Oct	011 (n)	39	15	4	2	6
	Nov - Feb	016 (NNE)	51	17	0	7	18

*1 Data on average mph was scarce, i.e. only one or two months represented in the average

*2 Data on visibility ¼ mi, averages of months March - Oct could be misrepresentative. Heaviest months are June, July, Aug, Sept., remaining months usually 0 days

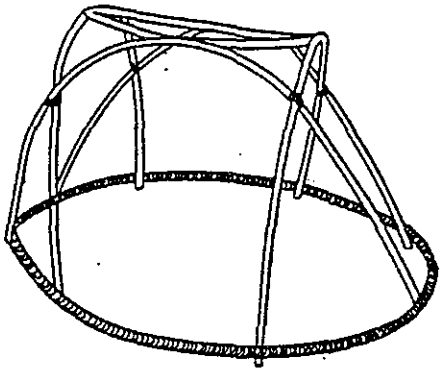
*3 Data on maximum 32 F & Below, averages of months March - Oct could be misrepresentative. March has most # of days maximum 32 F & Below

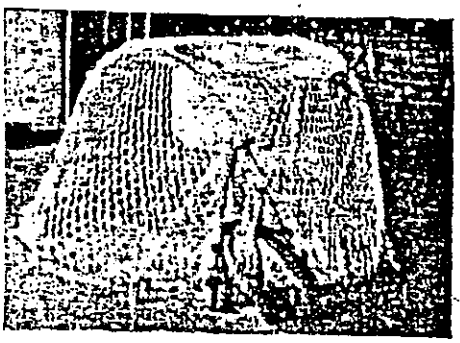
AVERAGES OF A 5 YEAR PERIOD 1975 - 1979	WIND DIRECTION	WIND VELOCITY Fastest MPH	WIND VELOCITY Avev. MPH	FOG VISIBILITY ¼ MI	ICING IN ATMOSPHERE MAXIMUM 32 F & BELOW	ICING IN ATMOSPHERE MINIMUM 32 F & BELOW
MARCH THRU OCTOBER	016 (NNE)	38	16	7 Days/Month	4	10
NOV THRU FEB	08 (N)	50	18	2 Days/Month	11	22

3. 漁具構造

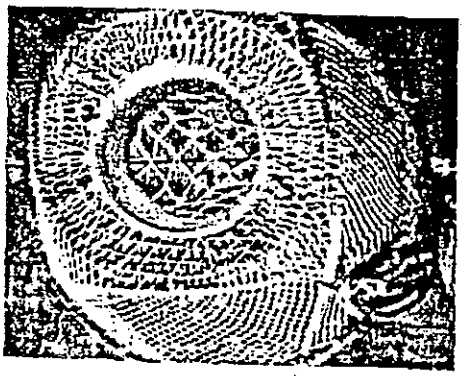
（a）漁　具　図

全体（骨格）

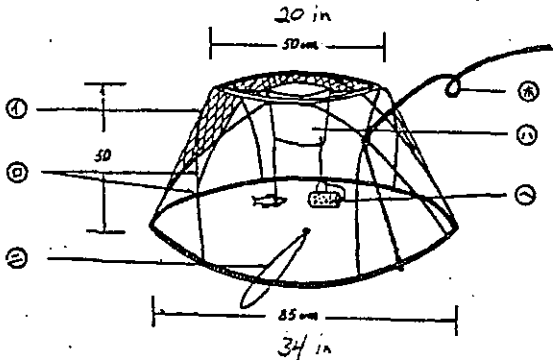




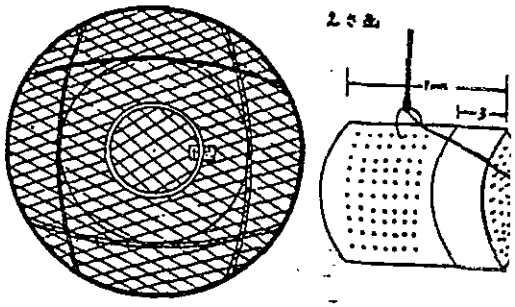
完成図



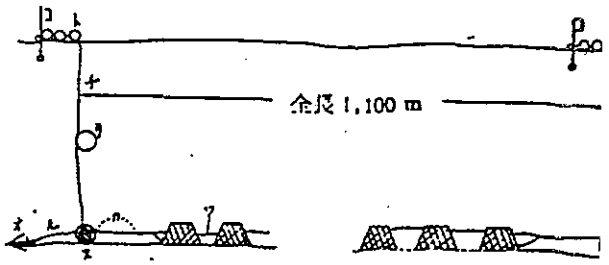
上からみたじょうご口

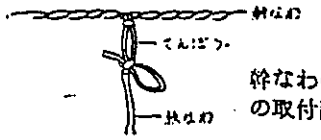


上面図



（b）漁具敷設図





枠なわのてんぼうと
の取付図

（c）付　属　具

巻き揚げ機（ドラム）刺し網と同様のもの用。魚群探知機

（d）仕立に要する人工数

1人で1日5～8かごを作る。全部を作るのに8人で1カ月を要する。1かごにつ～850円。全漁具では125万円になる。耐用は3年であるが、竹とえさ缶は1年ごとに更いる。トワインはカッチ染めにする。

参　考　事　項

（a）市町村別着業隻数（昭和40年調）

根室支庁管内	30隻
（根室市	29隻）
（標津町	1隻）
10～20 t	8隻
20～29	22

（許可制限で10 t 以上30 t 未満に限られてい

（b）1隻当りの平均漁獲量（年間）

167,000kg	7,396千円

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