

M E M O R A N D U M

TO: Council, SSC and AP Members

FROM: Jim H. Branson  
Executive Director

DATE: January 2, 1986

SUBJECT: Management of Gear Shares of Sablefish Allocation in the Gulf of Alaska

ACTION REQUIRED

Review sablefish gear allocation and Council intent of Amendment 14. Provide clarification and guidance to the Regional Director as necessary.

BACKGROUND

Public testimony during the December Council meeting indicated a strong possibility of directed trawling for sablefish in the Gulf of Alaska during 1986. Since we are unable to determine the ability or the desire of the individual trawl operators to harvest large quantities of sablefish there is no way of determining how big a problem this may be. This memorandum reviews the recent Council meetings for guidance as to the Council's intent when it passed Amendment 14. It examines the regulatory framework currently in place and outlines some possible management alternatives.

The concern of the Council is the NMFS response once the trawlers' share of the sablefish OY (20% in the Central and Western Gulf) is taken. The Council's intentions were clearly that any trawling which would remove sablefish would stop once their 20% was landed. The final rule notice does not, however, reflect the Council's intentions. In 672.24(2) Gear Limitations - Central and Western Areas, it specifies:

When the share of the sablefish OY assigned to any type of gear for any year and any area of district under this paragraph as been taken, the Regional Director will close that regulatory area or district to all fishing for groundfish with that type of gear, subject to 672.20(b) of this part.

Emergency Regulation 672.20(b) gave the Regional Director the options to keep the area open to targeting for other species. It states: ". . .when the Regional Director finds that the OY for groundfish species in a district or area has been reached, the Secretary will normally be required to close fishing for only that particular species in that district area." This regulation is no longer in effect, but the regional office of NMFS may enact a similar one for the 1986 fishery.

During the May 1985 Amendment 14 discussion the AP deferred to the Council the division of the trawlers' share into directed and bycatch allocations. It is not clear whether the Council intended to allow a directed trawl fishery for sablefish in the Central and/or Western Gulf or if it were to be a bycatch fishery only (the Eastern Gulf trawl allocation is clearly specified as a 5% bycatch allowance only). Both viewpoints were presented during public testimony and in the Council discussion. It was stated that the relatively large percentage of OY given to trawlers was a bycatch to allow for the rapid expansion of domestic trawling. Council staff has estimated the 1986 sablefish bycatch requirements for all trawl fisheries in the Gulf of Alaska to be 1,055 mt, or 12% of the OY. The data and assumptions for this estimate are provided in D-3(a)(1). Other discussion supported a limited directed trawl fishery. The final rule notice in the Federal Register specifies both trawl and hook and line gear as "allowable gear types for the directed sablefish fishery" in the Central and Western regulatory areas, stating:

The 20 percent allocation to U.S. trawlers is more than is needed to support a bycatch in other target fisheries. It is intended by the Council to provide for a directed trawl fishery to aid trawl operations that are dependent on small profit margins resulting from low value groundfish species.

The problem facing the industry is that targeting on sablefish by trawlers may result in the 20% of the OY being caught much earlier in the year. If, when this is reached, the Central and Western Areas were closed to all trawling as was the Council's intent, large amounts of other trawl-caught species such as pollock, cod and flounder would remain unharvested. This would exacerbate the problem of maintaining a steady flow of groundfish to domestic processors throughout the year. If, however, targeting occurs and trawling is allowed on other species after the sablefish allocation is taken, the trawlers would be imposing costs on the longliners by increasing the harvesting mortality of sablefish. Either way the costs are spread out over a large number of fishermen while the benefits of directed fishing accrue to the individual vessels targeting on and selling sablefish. An individual vessel owner/operator facing the current regulations is behaving rationally by targeting on sablefish. If he is reasonably confident the trawl fishery will not be shut down, the profit maximizing behavior may be to target on sablefish and harvest it before someone else does. He could then target on the other groundfish fisheries after the 20% allocation is landed and treat the sablefish as a prohibited species. Even if trawling were to be shut down it still may be rational to target on sablefish if the value of the harvested sablefish provides the vessel owner/operator an income greater than the income he could derive from the foregone harvesting of other species.

#### Options

1. Status quo with no recommendation to the Regional Director. This option assumes that the Regional Director will issue an emergency rule for 1986 similar to 672.20(b) which may not close the trawl fishery when the sablefish trawl allocation is taken. Therefore, sablefish could be designated as a prohibited species. Declaring sablefish a prohibited species would clearly be contrary to the Council's desire to count all removals of fish to the extent possible.

2. Status quo with a recommendation to the Regional Director that he close the trawl fishery when the trawl allocation of sablefish is taken. The Regional Director would not reimplement the expired emergency regulation, reflecting the Council's original intention.

3. Recommend measures to limit targeting on sablefish.

Note: For any of these options, a domestic observer program is necessary for enforceability.

a. Trip Limits. There have been two instances where management agencies on the Pacific Coast have encountered problems similar to this one. In both cases, management using trip limits was established. In British Columbia, the trawlers argued for an increased proportion of the sablefish harvest relative to pot vessels. The Department of Fisheries and Oceans implemented a system in 1985 imposing a 10,000 lb trip limit with no total allocation. For the 1986 fishery, the trawlers have been given an allocation of 350 mt (about twice their previous year's bycatch and less than 10% of the total quota). To prevent targeting on sablefish, the trawlers were also limited to 20,000 lbs. of sablefish per trip. This is a less binding constraint in that the 20,000 lbs is about ten times the average trip's share of sablefish. The Department seems reasonably satisfied with the results. It should be noted that they had the support of both pot and trawl fishermen in this solution.

The Pacific Fishery Management Council's (PFMC) experiments with trip limits have been more troublesome. When 90% of the OY was reached in the 1985 sablefish fishery the remainder was to be split evenly between fixed gear and trawl gear. The trawlers were to be limited to the percentage of their total catch that sablefish may comprise, which was estimated to be 13%. The PFMC experience was not particularly successful because they could not maintain good enough landing records to make timely decisions when 90% of the OY was taken. By the time the PFMC had set trip limits, additional landings had closed the fishery. The trawlers have also criticized the 13% allocation as too small and too constraining. The PFMC has also used trip limits since 1982 in both its Sebastes and widow rockfish fisheries.

Trip limits have been criticized in both cases because high costs render them unenforceable. High-grading of fish landed under the trip limit is also a strong possibility. In the case of sablefish, small fish are probably discarded in favor of larger, more valuable fish.

b. Timed Allocations. Another measure to limit targeting on sablefish is timed allocation (e.g. quarterly) of the 20% trawl share of sablefish. It is entirely possible however that one four-month season would simply be replaced with four one-month seasons. This measure does not address the problem of trawl targeting on sablefish but it does increase management costs.

c. Individual share quotas. In this alternative, each vessel is given a percentage share of the sablefish OY. The shares can be either transferrable or non transferrable. Under such a system the costs imposed on a fishery by fishermen who target on sablefish or who maintain

high levels of bycatch are borne only by that individual. Each fisherman is constrained by his own quota; however, if the quotas are transferable the individual could purchase/lease shares from those who are able to fish without high levels of bycatch. Any system along this line is complex, would require rigorous management, and is probably not worth considering under present funding levels.

1986 JVP Bycatch Requirements

General Assumptions

JVP Gear Shares

For P. cod<sup>1/</sup> 64% bottom trawl (bt) 36% Longline (LL)  
 For Flounder 100% bt  
 For Pollock 0% bt 100% mid-water trawl (mwt)

1986 JVP

Pollock = 40,000 mt (W/C) + 35,000 mt (O. Shel.) = 75,000  
           1,695 mt (bt) 73,306 (mwt)  
 P. Cod = 5,480 mt (W/C) 3,480 mt (bt) 2,000 mt (LL)  
 Flounder = 2,120 mt (W/C) 2,120 mt (bt)

Total JVP bt = 7,295 mt  
Total JVP mwt = 73,306 mt  
Total JVP LL = 2,000 mt

Rates and Estimated Bycatch

<u>Fully-utilized Species</u>	<u>mwt pollock</u>	<u>bt Pollock, P. Cod, Flounder</u>	<u>LL P. Cod</u>	<u>Total JVP Bycatch</u>
Sablefish	.0002 15 mt	.02 146 mt	.02 40 mt	201 mt
P.O.P.	.0002 15 mt	.002 15 mt	.0003 1 mt	31 mt
O. Rockfish	.0003 22 mt	.003 22 mt	.0007 1 mt	45 mt
Salmon	.0008 59 mt	.0007 5 mt	-0- 0 mt	64 mt
King Crab	-0- 0 mt	.002 15 mt	-0- 0 mt	15 mt
Tanner Crab	-0- 0 mt	.002 15 mt	.0002 1 mt	16 mt
Halibut	.0004 29 mt	.038 277 mt	.092 184 mt	490 mt

1986 ABC and OY of Fully-utilized Species

<u>Species</u>	<u>ABC</u>	<u>OY</u>
Sablefish	14,100 mt (W/C)	9,000 (W/C)
P.O.P.	6,100 mt (W/C) for complex	3,266 (W/C)
	3,770 mt (W/C) for aleutus	
O. Rockfish	n/a	4,400 Gulfwide

1/ Based on permit applications.

1986 DAP Trawl Sablefish Bycatch Requirements

General Assumptions

DAP Gear Shares

For. P. cod            85% bottom trawl (bt) 15% Longline (LL)  
 For Flounder        100% bt  
 For Pollock         25% bt 75% midwater trawl (mwt)  
 For Sablefish       15% bt 5% mwt

1986 DAP

Pollock = 40,000 mt (W/C) + 5,000 (O. Shel.) = 45,000  
           11,250 mt (bt) 33,750 mt (mwt)  
 P. Cod = 29,400 mt (W/C)  
 Flounder - 6,168 mt (W/C) 6,168 mt (bt)  
Total DAP bt = 42,408 mt  
Total DAP mwt = 33,750 mt

Rates and Estimated Bycatch

<u>Fully-utilized Species</u>	<u>mwt Pollock</u>	<u>bt Pollock, P. Cod, Flounder</u>	<u>Total DAP Trawl Bycatch</u>
Sablefish	.0002      7 mt	.02        848 mt	855 mt

For Western/Central Area

Trawl DAP sablefish bycatch + trawl JVP sablefish bycatch = total trawl sablefish bycatch

$$855 \text{ mt} + 201 \text{ mt} = 1,056 \text{ mt}$$

Trawl share of sablefish in Western/Central Area equals 20% OY

W/C sablefish OY = 9,000 mt

20% sablefish OY = 1,800 mt

Estimated trawl bycatch is approximately 12% sablefish OY.

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January 9, 1986

Jim H. Branson, Executive Director  
North Pacific Fishery Management Council  
P.O. Box 103136  
Anchorage, AK 99510

Dear Jim:

I believe the best way to spread the sablefish OY among the trawl fleet and avoid closing the entire trawl fishery when that 20% of the total Gulf OY is taken is to give the OY to specific segments of the trawl fleet.

Whether that proportionment is done by boat, person, company, or association, is really immaterial as long as individual segments of the fleet are responsible for their own performance. They can close only themselves down if they target excessively on sablefish or fail to avoid excessive numbers as an incidental catch.

Sincerely,

DB -

Donald E. Bevan

*by JHB  
from phone call 1/8/86*

M E M O R A N D U M

TO: Council, AP and SSC Members

FROM: Jim H. Branson *JHB*  
Executive Director

DATE: January 7, 1986

SUBJECT: Gulf of Alaska Groundfish Fishery Management Plan

ACTION REQUIRED

Review request from State of Alaska for emergency action to protect king crab.

BACKGROUND

At the December 1985 meeting ADF&G and NMFS presented a discussion paper that summarized the status of the king crab resource in the Kodiak area and the potential damage to those stocks from on-bottom trawling. The condition of the Kodiak king crab resource remains extremely poor. The number of egg-bearing females has been below normal with no sign of recruitment in at least three years. The directed king crab fishery has been closed since 1983 to protect the remaining king crab and allow for rebuilding.

Observations collected by ADF&G from bottom-trawl vessels have shown high rates of incidental king crab catch in two primary areas, Marmot Flats and Alitak Flats located off Kodiak Island. Catch rates are highest during the spring months when king crab migrate inshore for reproduction with the trawl bycatch imposing significant mortalities. The ADF&G and NMFS have prepared an analysis for the Council and it is included as agenda item D-3(b)1. An oral report summarizing the analysis and outlining ADF&G's emergency action request will be presented during the meeting.



CONSERVATION CONCERNS OF THE KODIAK KING CRAB RESOURCE:  
A DISCUSSION OF MANAGEMENT OPTIONS

Prepared for:

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January 8, 1986

## INTRODUCTION

Stocks of red king crab, Paralithodes camtschatica, in the waters around Kodiak island are at historical low levels. The directed king crab fishery has remained closed for the 1983, 1984 and 1985 fishing seasons to protect stocks. The condition of the stocks is not expected to improve for at least several years since the abundance of small juvenile crabs is extremely low. The remaining reproductive potential must be conserved in order to rebuild the stock.

Groundfish fishing for cod, pollock, and flounder in the Kodiak area with hard-on-bottom trawls has been gradually increasing in recent years. During 1986 the harvest of these species with bottom trawls in the Kodiak area is expected to increase significantly. Unlike most other fisheries which encounter soft-shell king crab, groundfish bottom trawling is not currently subject to seasonal restrictions. Since many of the groundfish trawling grounds overlap the distribution of king crab, there is a large potential for substantial female king crab mortality during the spring 1986 king crab soft-shell period.

King crab are known to congregate during the spring in certain areas to molt and mate. Approximately 70% of the female red king crab from Kodiak stocks are estimated to be congregated in two areas, Marmot and Alitak Bays and the areas immediately offshore (Figure 1a). After molting, king crab exoskeletons are soft and pliable and require 2 to 3 months to fully harden. During this "soft-shell" period which runs from February 15 to June 15, king crab are particularly susceptible to damage from encounters with fishing gear and handling. Directed king crab pot fisheries have not been allowed during the soft-shell period since the late 1960's in the Kodiak area. Scallop dredge and Dungeness pot fisheries have also been restricted in areas where soft-shell king crab congregate.

Management action is proposed to address two significant management concerns: the conservation of spawning and molting king crab and improving the bycatch data base from the domestic trawl fleets.

## PROPOSED MANAGEMENT MEASURES

- 1) Establishment of a time and area closure to protect major concentration of spawning king crab stocks.
- 2) Establishment of a check in/check out system, with provision for a mandatory observer program, for hard-on-bottom trawl vessels operating in certain times and area of known king crab habitat.

## TIME AND AREA CLOSURES

OPTION 1. Two areas immediately offshore from Marmot and Alitak Bays (Figure 1) will be closed to all hard-on-bottom trawl and crab pot fishing between February 15 and June 15. Such action is necessary to prevent additional fishing and handling mortality of king crab taken incidentally to other target fishing operations. King crab stocks are severely depressed. The king crab fishery has been closed for the past three years in response to these historically low population levels. King crab congregate for the purpose of mating and molting during the February 15 - June 15 period. Molting crab, due to the soft shell nature of their exoskeleton, are particularly vulnerable to damage which results in high mortality. During the 1984 king crab survey, approximately 70% of the female king crab spawning stock are found within the proposed closed area.

Negative impacts on the trawl fishery as a result of option 1 are estimated to be minimal. Flounder are the primary bottomfish resource of commercial importance in the Alitak Flats area and are widely distributed in other areas around Kodiak Island. Flounder, Pacific cod and pollock resources all occur on the Marmot Flats area. All of these resources are widely distributed in other nearby areas around the northern end of Kodiak Island. Only shore based operations in Kodiak City will be negatively affected by the Marmot closure, which will require some additional vessel travel time. The shore based fleet did not fish the Marmot closed area during May-December 1984 under a cooperative agreement with ADF&G. Fishing effort in late 1985 and early 1986 has increased in the Kodiak area. With the influx of new vessels the cooperative management agreement may no longer be effective.

Negative impacts on the Tanner crab fishery are also minimal. The Tanner crab fishery in the two closed areas was concluded in 1985 by February 18. Impacts in the Dungeness crab fishery the impacts are also negligible since the Dungeness crab season in the Alitak area does not open until June 15. In the Marmot Flats area in 1985, less than 77,000 pounds of Dungeness crab were harvested prior to June 15.

OPTION 2. Most significant king crab grounds around Kodiak Island (Figure 17) would be closed to hard-on-bottom trawling and crab pot fishing between February 15 and June 15. According to the king crab distributions observed during the 1984 king crab survey, such a time and area closure would provide nearly 90% protection to the female king crab stock during spawning, molting and the soft-shell period. The closure would also have a salutary effort of protecting male king crab which may be taken and killed as bycatch in groundfish and shellfish fisheries.

Negative impacts on the trawl fishery, although not quantifiable, would be more severe than under option 1. Flounder and cod are known to be widely distributed around Kodiak. Approximately 15%

of the Central Gulf catches of these species in 1984 and 1985 came from the proposed closed areas under option 2 between February 15 and June 15. Groundfish operations during the February 15 - June 15 period would be required to expend more fuel to avoid the closure area and search for new fishing grounds. The shore based fleet would likely be impacted the greatest because, unlike catcher processors or floating processors, their fishing opportunities may be significantly curtailed. Negative impacts on the Tanner crab fishery are fairly small, if the 1986 fishery proceeds similarly to 1985. However, if the fleet stages a price-related strike, or for any other reason delays fishing, then the king crab time and area closure would have a significant impact on the Tanner fishery.

### DOMESTIC OBSERVER DATA IMPROVEMENT

OPTION 1. A vessel check in/check out system would be established with provision for a mandatory observer for hard-on-bottom trawl vessels operating in areas of known king crab habitat between February 15 - June 15 (Figure 17). There is a paucity of bycatch data from domestic trawling operations in the Gulf of Alaska. Because of the conservation concerns with the Kodiak king crab resource, information on king crab bycatch in these trawl operations are essential. The council must have this information to adequately set PSC or other limits as proposed by the plan team for the 1986 amendment to the Gulf of Alaska groundfish FMP. In addition to king crab bycatch information, bycatch levels of halibut and other species important to the council and state will be collected.

The vessel check in/check out procedure is necessary to determine effort levels and to select vessels for placement of observers so that observer samples are representative of the fishing activities of the entire fleet. Provisions for placing a mandatory observer onboard these vessels are essential to allow for acceptable fleet coverage over a broad area through time.

The check in/check out procedure could be implemented either by the NMFS regional office or in cooperation with ADF&G. Funding for observers, although not budgeted, may be secured through reprogramming or supplemental appropriations.

OPTION 2. Continuation of the present voluntary basis for placing observers aboard groundfish vessels would be encouraged by the council. While observer programs operating on a voluntary basis have provided some data on incidental catches at the low fleet effort levels in the past, they may not be satisfactory to insure adequate data collection for management purposes. Because of budgetary restrictions, currently planned domestic observer coverage in this area for 1986 is much lower than that for 1984.

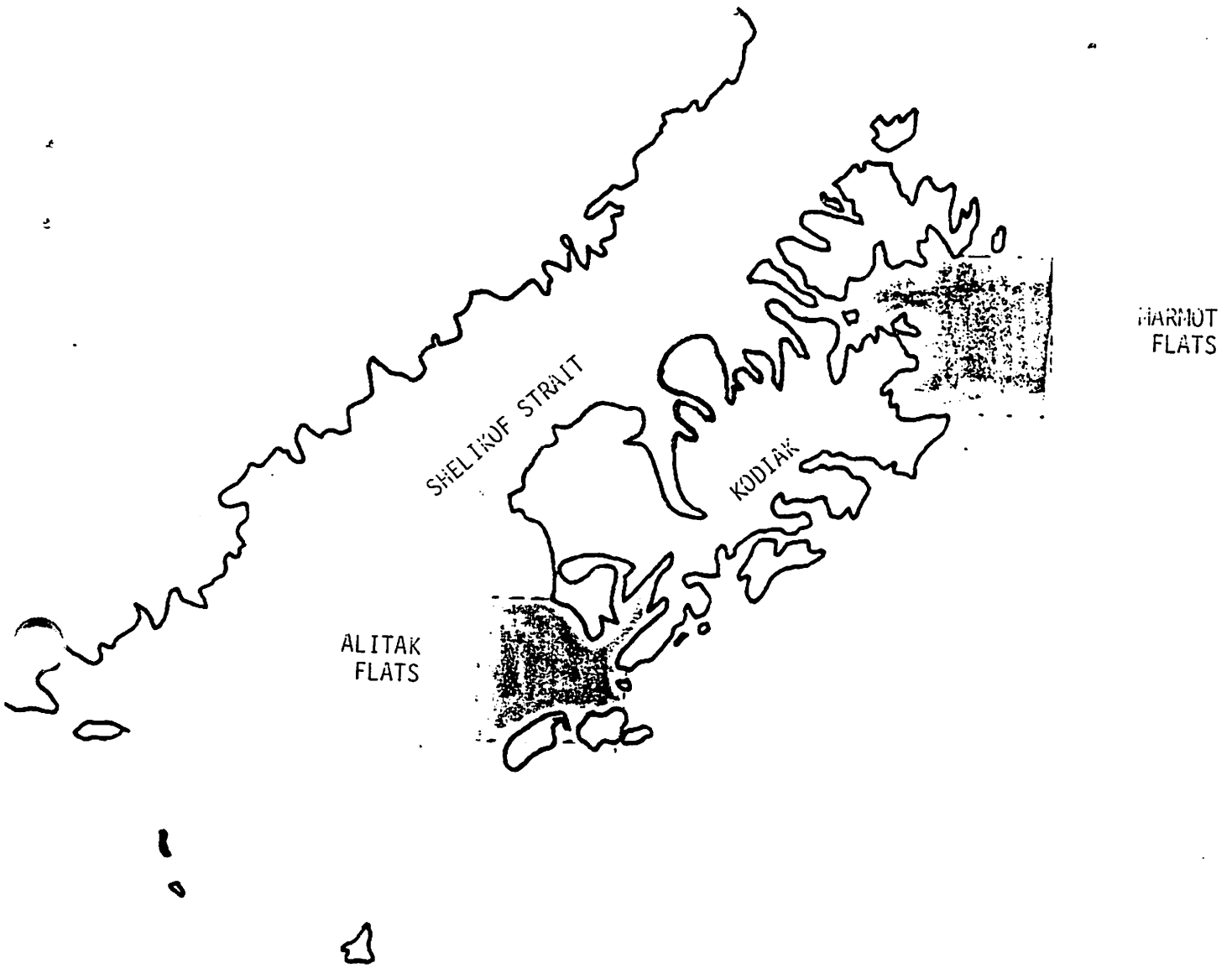


Figure 1-- Time and area Closure Option 1. All hard-on-bottom trawl and shellfish pot fishing prohibited in the Marmot and Alitak flats areas from February 15 to June 15.

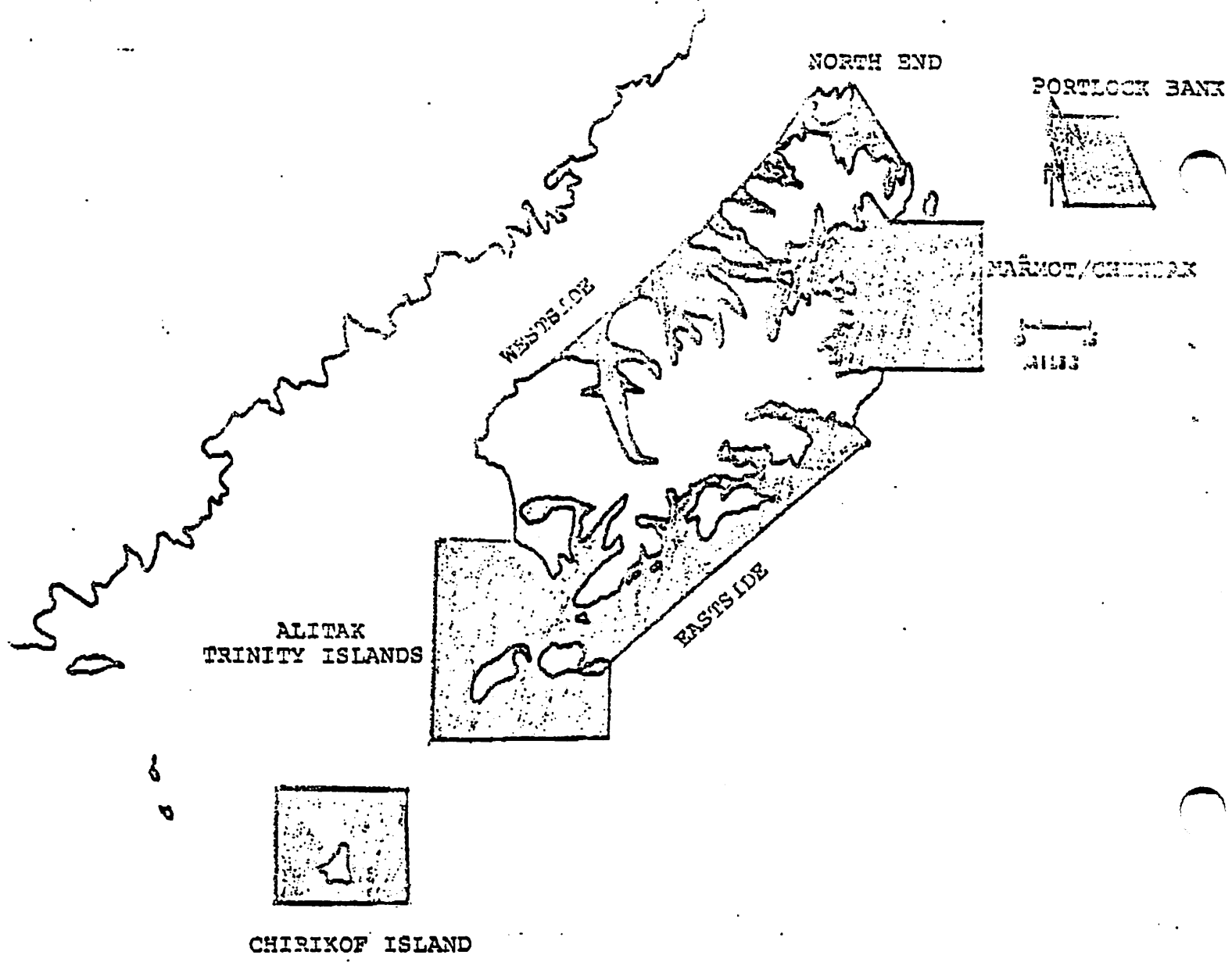


Figure 2- Time and Area Closure Option 2. All hard-on-bottom trawl and shellfish pot fishing prohibited from February 15 to June 15.

## CURRENT STATUS OF KODIAK RED KING CRAB STOCKS

Alaska Department of Fish and Game (ADF&G) surveys indicate that the abundance of king crab of all sizes in the Kodiak area has declined twentyfold from the peak which was observed in 1977. (Figure 2a). King crab were likely even more abundant before the establishment of annual surveys in 1971. Commercial harvests were reduced sharply after the peak harvest in 1965 of over 95 million pounds and averaged 15.8 million pounds over the period 1970 to 1980 (Figure 3). Because of low stock conditions, commercial harvests were not allowed in 1983, 1984, and 1985.

It has not yet been possible to determine the causes of the population decline from the available data, although overfishing, disease, parasitism, handling and bycatch mortality, predation, and environmental factors have all been hypothesized. Survey data indicate that recruitment to the stock has been weak for eight consecutive years (Figure 2a). During the same period, mortality of adult males and females has been unexpectedly high. Since there are no signs of significant incoming year classes, population levels are projected to remain depressed for at least four additional years.

Current concerns for the conservation of crab stocks in the Kodiak area focus on the abundance of females, because males are known to be polygynous. King crab males have been observed to mate successfully with four to nine females (Powell et al 1974). For this reason commercial fisheries for king crab have been allowed to retain only males, which has resulted in skewed sex ratios. The abundance of male king crab has been assumed not to limit the reproductive success of females unless sex ratios become extremely skewed. In all Kodiak areas except the Northeast district, sex ratios are currently less than 9 females per male.

The relationship between the number of female spawners and recruits is not well established for red king crab. Reeves and Blau (1984) have performed a preliminary analysis of spawner-recruit relationships for Kodiak king crab, based on survey estimates of the abundance of females and the recruits which result in succeeding years. The preliminary results for the Northeast District king crab stock (Figure 4), indicate that the optimum number of spawners would be achieved at a survey average density of 4.8 mature females per pot. Because of serial correlations in the short time series of available data and the possibility that density independent factors may have caused the recent reductions in king crab numbers, these methods may underestimate the optimum spawning density. King crab survey data indicate that steep declines in the abundance of females have occurred in each of four subareas surveyed in the Kodiak area (Figure 5), to levels below 10% of those present during the 1970's. The current low population level of mature females would almost certainly place the population on the steeply ascending limb of the spawner recruit curve where small increases in the

number of female spawners has the potential to greatly increase the number of recruits.

#### TEMPORAL DISTRIBUTION OF FEMALE KING CRAB IN SOFT-SHELL CONDITION

Adult female king crabs must molt annually in order to mate and extrude eggs. Crab exoskeletons require 2 to 3 months to fully harden after molting. Since males grasp only females that are ready to mate, the occurrence of grasping pairs in the natural environment is a good indicator of impending molting by females (Powell, 1972). ADF&G has collected information on more than 3,400 grasping king crab observed by SCUBA divers during the nine year period 1963-1971 in the Kodiak area (Table 1). Grasping pairs were observed as early as January, but April was the peak month with grasping declining by late May.

Newly mature crabs are the first crabs to molt during the annual molting and mating cycle. Powell et al (1973) observed molting of newly mature females and males during February in both the natural environment and in undersea pens. Older adult females began molting and mating a month or more later. February and March were the primary periods for newly mature females to molt and mate while April and May were the primary periods for older females.

McMullen (1967, 1968) documented the presence of reproductive king crab stocks on offshore ocean banks, including the "Marmot Flats" area, on the east side of Kodiak Island. Grasping pairs and newly molted crabs were found on these offshore banks from late April to early May. ADF&G observers aboard a commercial domestic trawler targeting on flounders between April 11 and April 13, 1984 in the Marmot Flat area also found large numbers of grasping and soft-shell king crab. Gray and Powell (1966) found that 23 percent of the adult females captured in trawls in Alitak Bay between May 10 and May 18, 1962 had not yet molted. Kingsbury and James (1971) indicate heavy molting and mating occurred during April, but by June nearly all females had molted.

Directed commercial fishing for king crab during the soft-shell period has been prohibited since the 1960's because of the generally acknowledged higher mortality associated with sorting and handling soft-shell crabs. In 1968 the season for king crab closed on March 31 and was scheduled to reopen June 16. The presence of soft-shell male and female crabs in test fishing catches caused a delay in the scheduled opening of the fishery until August 1, 1968. Historically, stock assessment surveys conducted in the Kodiak area have been undertaken no earlier than late June as soft-shell crabs have generally hardened enough by then to allow handling and tagging.

In summary, most mating and molting occurs in March, April and May. The amount of molting in February appears to be dependent on the abundance of newly mature males and females. The presence of molting crabs in May assures that soft-shell crabs are present in



June. There are relatively few crabs molting before mid-February or after mid-May; therefore, the period from February 15 to June 15 encompasses almost all of the molting and soft-shell condition.

#### SPATIAL DISTRIBUTION OF FEMALE KING CRAB IN SOFT-SHELL CONDITION

During the 1960 through 1968 period, commercial fishing of king crab was permitted during all or part of the molting and soft-shell period. While only males were retained in the catch, the distribution of the landed catch of males during the February through May period is roughly representative of the distribution of females since the two sexes aggregate during the mating season. These catch data indicate two major areas of removals, one in the Marmot Flats area off of the northeast side of Kodiak Island and the other just south and east of Alitak Flats and Trinity Islands. (Figure 6). The distribution of commercial catch would tend to differ somewhat from the distribution of soft-shell females since the fishery targetted on hard-shell crabs as soft-shell crabs were not marketable. Hard-shell crabs prior to arriving on molting and mating grounds are found in generally deeper waters than those crabs that are molting or engaged in mating. Also, the catches in many statistical areas come from a small portion of the total statistical area depicted in Figure 6. The distribution shown reflects virgin stock conditions and very high population levels experienced through the middle 1960's.

ADF&G king crab pot surveys provide another source of information on the distribution of female king crab. However, these surveys are conducted during the summer months after the soft-shell molting period, so that distributions inferred from the survey may differ from those of females in the soft-shell condition. The differences in the distributions would be related to the rate of movement of female king crabs during this period. The 1985 survey distribution data are presented as the average catch of crabs at each sampling station, standardized to a 24 hour soak period (Figure 7a-f). Extremely low densities of crabs were found at the edge of the Marmot Flats area (Fig. 7a), although there were only a few stations in this area. Similar low densities were found in the Marmot Bay area (Fig. 7b). Low densities of king crabs were found in the Chiniak Bay area (Fig 7c), with relatively high densities in the Alitak Flats (Fig. 7e) and Alitak Bay areas (Fig. 7f). Abundance was extremely low in all other areas.

A limited amount of king crab distributional data has been obtained from observers aboard domestic groundfish vessels fishing in the vicinity of Kodiak Island. Although the data are extremely limited, trawlers have encountered relatively high numbers of soft-shell females in the Marmot Flats area while targetting on flounders. High densities of king crab have not been encountered on the relatively few other fishing grounds sampled by observers. When soft-shell king crabs have been encountered on observed trips, they are present in relatively few tows, indicating that their distribution is highly clumped.

## DISTRIBUTION OF CURRENT GROUND FISH FISHING EFFORT

Kodiak groundfish surveys (Pereyra and Ronholt, 1976), indicate that the distribution of flounders such as rock sole and flathead sole overlaps the known distribution of king crabs. Observers placed aboard domestic trawlers targetting on cod and flounder in the Kodiak area have documented high crab bycatches, particularly in the Marmot Flats area. Trawling for flounders by domestic vessels in the Kodiak area has been largely experimental to date. Large increases in trawling effort are expected in the Kodiak area in 1986 according to the 1986 NMFS DAP survey. Because of these large increases in expected trawling effort, the distribution of fishing effort in 1986 cannot be accurately predicted from prior years. Since commercially viable concentrations of flounders were found in the Marmot Flats area by one fishing operation attempting to target on flounders in the spring of 1984, this area will probably receive considerable effort with the development of new flounder fishing operations. Rock sole and flathead sole are likely to be important species comprising the catch of flounder-targetted groundfish trawling operations. NMFS resource surveys indicate that substantial stocks of rock sole and flathead sole exist in both the Marmot Flat and Alitak Flat areas, as well as other areas around Kodiak Island (Figure 8a,b). The previous flounder fisheries delivered their catch to shore-based plants and were probably not inclined to travel beyond the Marmot Flats area near the port of Kodiak. Unlike these previous shore-based flounder operations, catcher-processor and mothership-processor vessels have expressed an interest and have already begun targetting on flounders in the Kodiak area in 1986. Freed from the constraints of travelling to port frequently to offload their catch, these fishing operations could easily operate in more remote areas to the south and west of Kodiak Island such as the Alitak Flats area.

## DISTRIBUTION OF CURRENT TANNER CRAB FISHING EFFORT

The distribution of Tanner crab fishing effort may be inferred from survey distributions of the density of Tanner crab to a limited extent. However the Tanner crab survey is conducted in the Kodiak area in July and August, while the fishery begins on January 15. During the summer surveys, the distributions of Tanner crab and red king crab appear to overlap considerably. In the summer 1985 survey (Figure 9a-f), dense concentrations of Tanner crab were found in the Chiniak Bay area (Fig. 9c) where king crab densities were moderate (Fig. 7c). Moderate densities of Tanner crab were also found in Alitak Bay (Fig. 9f), where king crab densities were relatively high (Fig. 7f). Concentrations of Tanner crab were found at other locations, such as south of the Trinity Islands and the vicinity of Kiluda and Ugak Bays, where king crab densities were extremely low.

Moderate Tanner crab fishing effort occurs in the Marmot Flat and Alitak Flat/Alitak Bay areas where soft-shell king crab occur.

Tanner crab catches from the Alitak Bay and Alitak Flats areas comprised 5% of the commercial Tanner crab harvest in the Kodiak district in 1983-84. Catches from the Marmot Flats area comprised 7.0% of the 1983-84 Tanner crab harvest. Most of the harvest from these areas occurred during March.

#### HANDLING MORTALITY OF KING CRAB

The handling mortality rates of king crab caught by trawling vessels in the Bering Sea, is estimated by observers at 70% (Griffin et al., 1983). Additional mortality results from crab that encounter the trawl gear but are not retained in the nets. While the extent of this additional mortality is unknown, Johnsen (1985) speculates that this additional mortality could affect as many as 15 crabs for every crab retained in the net. Fisher (1985) documents many methods that groundfish trawlers can use to reduce the bycatch mortality of king crabs. Unlike joint venture operations which tow trawl cod-ends to processing vessels for sorting, most domestic trawl operations sort their catch on deck soon after the trawl surfaces. By immediately discarding king crab from the catch during sorting, mortality rates on hard-shell king crab for domestic trawlers could be considerably less than those of joint venture trawlers. However, for king crab in soft-shell condition, any contact with fishing gear or handling will result in very high mortality.

When Tanner and Dungeness crab fishing occur during the king crab mating and molting period, king crab captured just prior to molting often molt in the pot when longer soak times keep them confined. Dungeness pots are typically soaked for longer periods than is usual in other crab fisheries. King crab which molt while trapped in pots are often killed by predators in the pot, or by water pressure when the pot is pulled. The use of triggers on Dungeness pots also increases the retention of king crabs. Removal of king crabs from Dungeness pots is hampered by their legs and spines catching on the small steel mesh. As for trawl gear, any handling of soft-shell king crab will result in very high mortality.

#### BYCATCH RATES OF KING CRAB IN OTHER DIRECTED FISHERIES

GROUND FISH. Prior to 1984 domestic trawl fisheries targeted primarily on cod and pollock. The cod and pollock fisheries to a large extent have been historically conducted along the northwest side of Kodiak Island adjacent to Shelikof Straits. Most of the these northwest Kodiak grounds were not prime habitat for king crab. A limited amount of observer data from these northwest Kodiak fishing grounds for vessels targetting primarily on pollock during 1978-79 and on Pacific cod during 1984 indicates that king crab bycatches are very low except for two samples from inshore areas of Ugak-Malina Strait and Karluk (Table 2).

In 1984 the first Kodiak domestic fisheries targeting on flounders occurred. The fishery took place on the northeast side of Kodiak Island, in part within an area (Marmot Gully/Chiniak Flats) considered to be prime king crab habitat. An observed trawl trip from this flounder fishery in the Marmot Flats area during April of 1984 recorded a trip average of 82.6 king crab per ton of targetted species over nine tows. Most of these crab were adults and approximately 40 percent were grasping. Some of the crabs were in soft-shell condition. Observer samples from other areas off of the northeast side of Kodiak island recorded very low king crab bycatch rates.

Observer samples from 1978-79 from the southeast side of Kodiak Island recorded high king crab bycatch rates in inshore areas of Sitkalidak Strait. Bycatch rates were moderate to low elsewhere. No observer data are available from groundfish trawl vessels operating in the proposed Alitak Flats closed area.

Fisheries for flounders in 1985 did not develop until late in the year. Observer samples from two vessels targetting alternately on flounders, Pacific cod and pollock from the northeast side of Kodiak Island during December indicate relatively low average king crab bycatch rates (Fig.10). Most of the king crab occurred in a single haul, with no king crab captured in 27 of the 32 hauls.

Fishing effort on flounders and cod in the Kodiak area is expected to increase substantially in 1986. The 1986 NMFS DAP survey totals for flounders in the area doubled over those for 1985. While in past years flounder and cod catches projected in NMFS beginning-of-the-year surveys have not actually been taken, a number of major fishing operations are known to be gearing up to process cod and flounder in the Kodiak area in 1986. A mothership/processor with several catcher vessels is known to be already in the area targetting on flounder and cod. At least one Kodiak shore-based processor is also known to be gearing up to process flounder roe and fillets. The 1986 DAP quota amounts for flounders and cod in the Central Gulf are 2,916 and 19,600 metric tons respectively. Substantial portions of these quotas could be removed by the available fishing effort in the Kodiak area. If bycatch rates are as high as indicated in some of the observer samples, king crab mortality in the Kodiak area could be extremely high.

TANNER AND DUNGENESS CRAB. Even though the distributions of Tanner, king, and Dungeness crab overlap, crab pot fishermen are able to avoid non-target species to some extent. Mixed species catches are undesirable economically since handling non-legal crabs in pot fisheries slows fishing operations. However the longer soak times used in Dungeness crab fisheries increase the chance that king crab will eventually encounter the pot, especially when gear is set at depths where the habitat overlaps most.

While hard-shell king crab are captured in the Tanner crab fishery, the small amount of available data indicates that few soft-shell crabs are captured. Unpublished ADF&G Tanner crab observer data (Table 3), describe the results of the examination of 416 pots by observers during the 1984 Tanner crab fishery between February 13 and March 13, at the beginning of the king crab mating and molting period. While the percentage of female king crab to legal male Tanner crab on the observed trips was 5.5%, no soft shell king crabs were observed. No data on king crab bycatches during peak king crab mating and molting periods are available since Tanner crab fisheries have closed prior to the peak molting period in recent years. Closure dates in the Tanner crab fishery fluctuate depending on the presence and lengths of fishermen's price-related strikes, the magnitude of the catch quotas and the amount of effort in the fishery. Some Tanner crab pots, particularly top entry pots and pots with triggers, are more effective in retaining king crabs and when long soaks occur, some crabs may molt in the pots and be lost as mentioned previously for Dungeness pots.

#### MANAGEMENT JURISDICTION OF FISHERIES IN THE CENTRAL GULF OF ALASKA

Because of the interjurisdictional and multispecies nature of the fisheries involved, resolution of the conservations concerns is necessarily complex, requiring close coordination between the state and federal governments.

In the Kodiak area, the Tanner crab and groundfish resources are cooperatively managed. State and Federal regulations also prohibit troll salmon fishing in Kodiak and all other waters off Alaska west of Cape Suckling (at 143 degrees 53 W longitude).

In the Tanner crab fishery, the state and federal government jointly developed separate, but identical, regulations for the EEZ. The ADF&G provides inseason monitoring and proposes inseason time and area closures which are coordinated through joint emergency/field order actions.

In the groundfish fishery, the state develops regulations applicable only within the three mile territorial sea of Alaska (Fig. 11). NMFS takes the lead for inseason groundfish monitoring and, as appropriate, closes fisheries by field order. For groundfish resources also found in state waters, ADF&G takes concurrent emergency order action.

The state manages groundfish resources within the internal waters of Prince William Sound and within the inside areas of Southeast Alaska separately from resources under the jurisdiction of the Gulf of Alaska FMP. The state has not managed any groundfish resources within the territorial sea or in internal waters in the vicinity of Kodiak separately from those under the jurisdiction of the Gulf of Alaska Fishery Management Plan.

For all other fisheries off Kodiak, such as king crab, shrimp, dungeness, salmon net, scallop and clam, the state provides exclusive management and conservation. To the extent that these species are taken incidental to groundfish and Tanner crab fisheries under federal jurisdiction, the ADF&G works cooperatively with NMFS through the council to develop management measures to document these incidental harvests and to minimize their impact.

#### PRECEDENTS FOR PROPOSED MANAGEMENT ACTIONS

Time and area closures have been used extensively by fisheries managers to reduce or eliminate additional fishing mortality on nontarget fisheries. In the Bering Sea/Aleutian Islands King Crab FMP, inseason time and area restrictions may be implemented without resorting to normal rule making procedures if crab resources might be harmed or wasted, or the OY not attained. One of the factors which must be considered by the Regional Director of NMFS or the Commissioner of ADF&G is the proportion of immature or soft shell king crab being handled.

In the Kodiak Management Area the state has established several time and area closures to reduce wasteful bycatches of king crab:

1. Since 1969, the scallop fishery around Kodiak has been restricted to certain areas (Fig. 12) in order to reduce king crab mortalities in scallop dredging operations.
2. Since 1970 the Dungeness fishery in the Southeast section of the Kodiak district has not opened until June 15 due to concerns for bycatch of king crab.
3. The shrimp fishery around Kodiak opens no sooner than June 15 and closes February 28 and thereby provides a measure of protection for soft shell king crab.

King crab incidental catch problems in groundfish trawl fisheries during the soft-shell period were anticipated by Katz and Bledsoe (1977):

The crabs congregate in well-established breeding grounds, during their annual molting-breeding season, and are highly vulnerable to trawl damage at those times due to their soft-shell condition. Should an active groundfish fishery develop, these grounds are almost certain to be closed to trawling during the molting-breeding season, to prevent destruction of brood stock.

#### PREVIOUS COUNCIL CONSIDERATION OF THE KODIAK TRAWL/CRAB ISSUE

During their March 1984 meeting, the Alaska Board of Fisheries considered an ADF&G staff proposal to limit the use of trawl gear in certain king crab habitats. The staff proposed to prohibit use of hard-on-bottom trawl gear, including roller gear, in the spring

from certain known king crab grounds in the central and western Gulf of Alaska (Figure 13). The proposal was submitted to the Board in response to low king crab population levels, which required the 1983 king crab fishery to not be opened, and to the development of the flounder fishery near Kodiak. Such a closure to protect soft-shell king crab was consistent with similar closures the board had established for the scallop and Dungeness fisheries. However, due to the interjurisdictional nature of the groundfish fisheries, the board recognized that an effective solution to this issue required cooperative efforts of the council.

The board took two actions at their March, 1984 meeting. The first was to adopt the Bottom Trawl Fisheries Management Plan (5AAC 39.163) which was designed to collect additional bycatch information from the trawl fleet through an observer program. The second was to recommend to the council to: 1) provide the NMFS Regional Director's field order authority to make inseason closures based on halibut and crab bycatches, 2) to establish a check in/check out procedure with opportunity to place onboard observers for trawl vessels operating in certain known king crab areas during the spring mating and molting period, and 3) to lobby for federal funds to implement a statistically and scientifically valid domestic observer program.

The Gulf groundfish FMP provides for time and area closures by field order issued by the regional director of NMFS for excessive king crab and halibut bycatches in the trawl fisheries. However, the implementing regulations do not. Amendment 14 implemented a framework procedure for annual adjustment of Prohibited Species Catch (PSC) limits for halibut and also gave the regional director field order authority to allow those fisheries using gear types that do not take halibut to continue when an area's PSC has been reached. Similar regulatory language for king crab is being proposed by the gulf plan team in its framework amendment for 1986.

Following the March 1984 board and council meetings, the ADF&G staff, with cooperation from the trawl fleet, placed observers onboard trawlers operating in Marmot Bay near Kodiak. Results of these trawling operations, reported above, show high bycatch levels of king crab. On May 14, 1984 the ADF&G Division of Commercial Fisheries sent the NMFS Fisheries Management Operations Division a "straw-man" report for evaluation of the trawl/king crab problem. On June 11, 1984 NMFS responded: "It is our view that had a real threat of substantial trawling in that area arisen during the critical mating/molting period described in your letter, a federal emergency closure would have been justified. Both the Washington, D.C. office of the National Marine Fisheries Service (NMFS) and the NOAA Office of General Counsel concur." (Appendix I).

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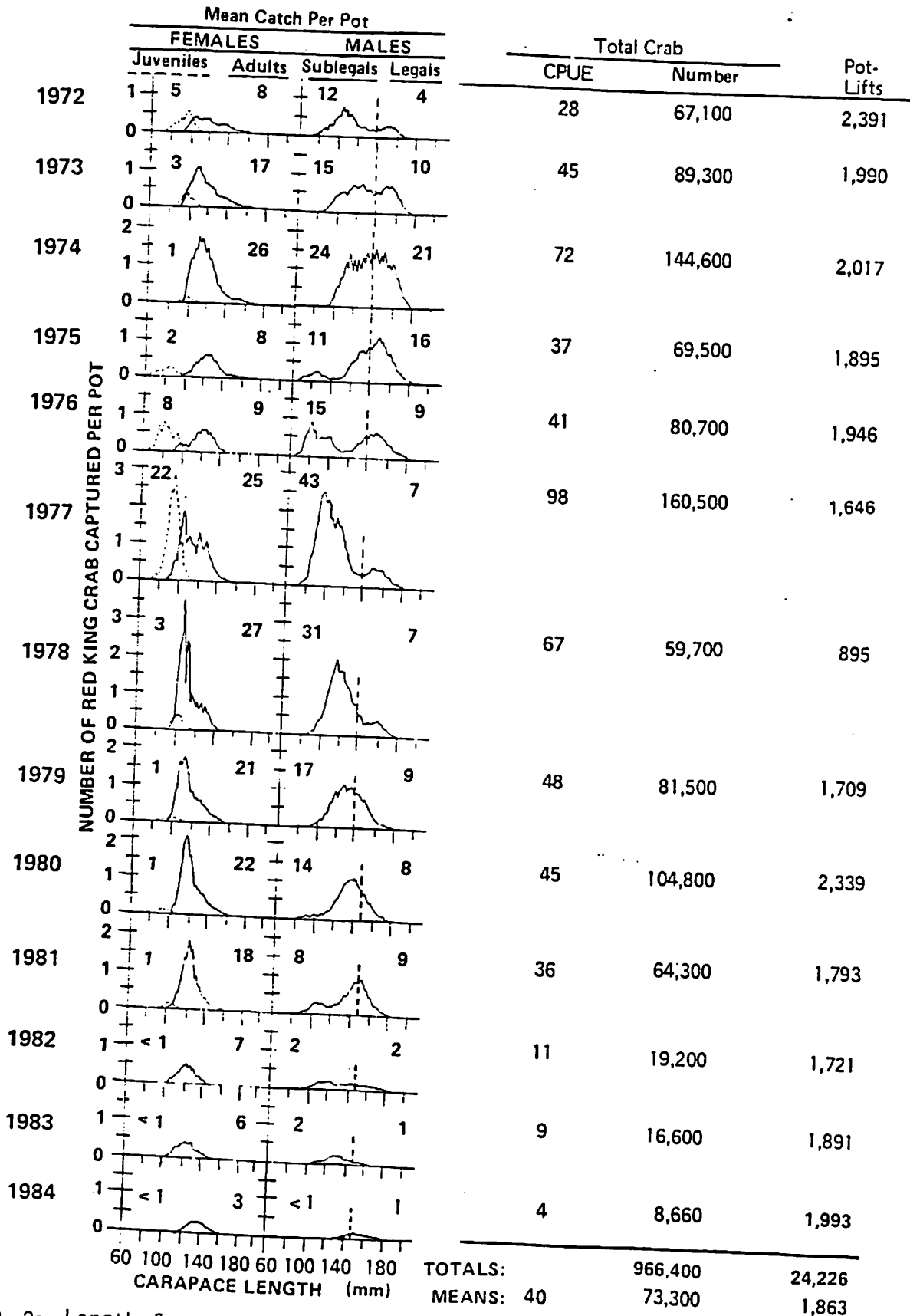


Figure 2a -Length frequencies of female and male red king crabs, and their catch and effort expended on annual crab surveys 1972-1984 Kodiak, Alaska. The vertical dotted line on the male graphs separates sublegals from legal size crab.

# HISTORIC KODIAK RED KING CRAB CATCH.

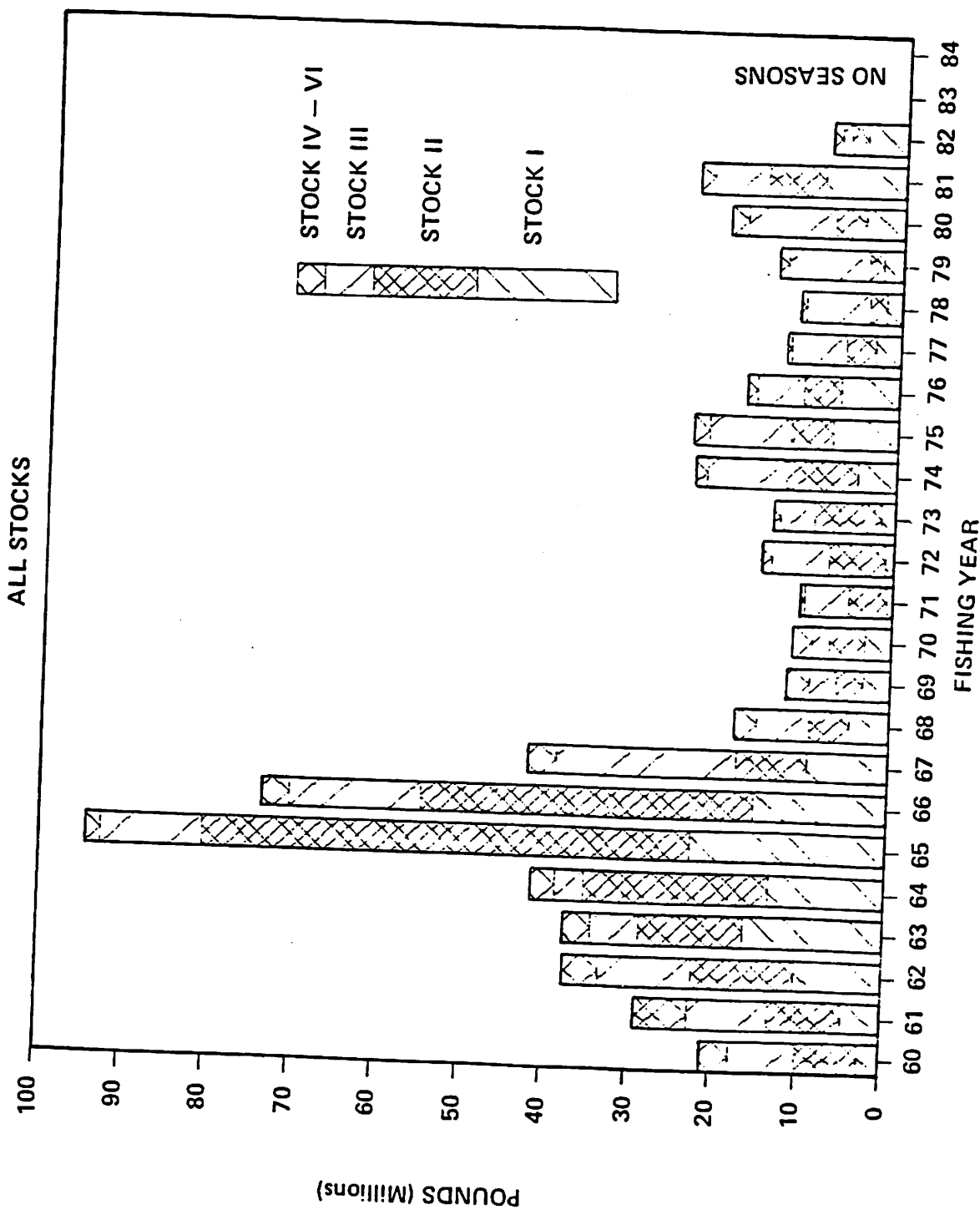


Figure 3 --Commercial red king crab catch by stock for the past 25 seasons 1960-1984, Kodiak, Alaska.

# Kodiak Northeast District

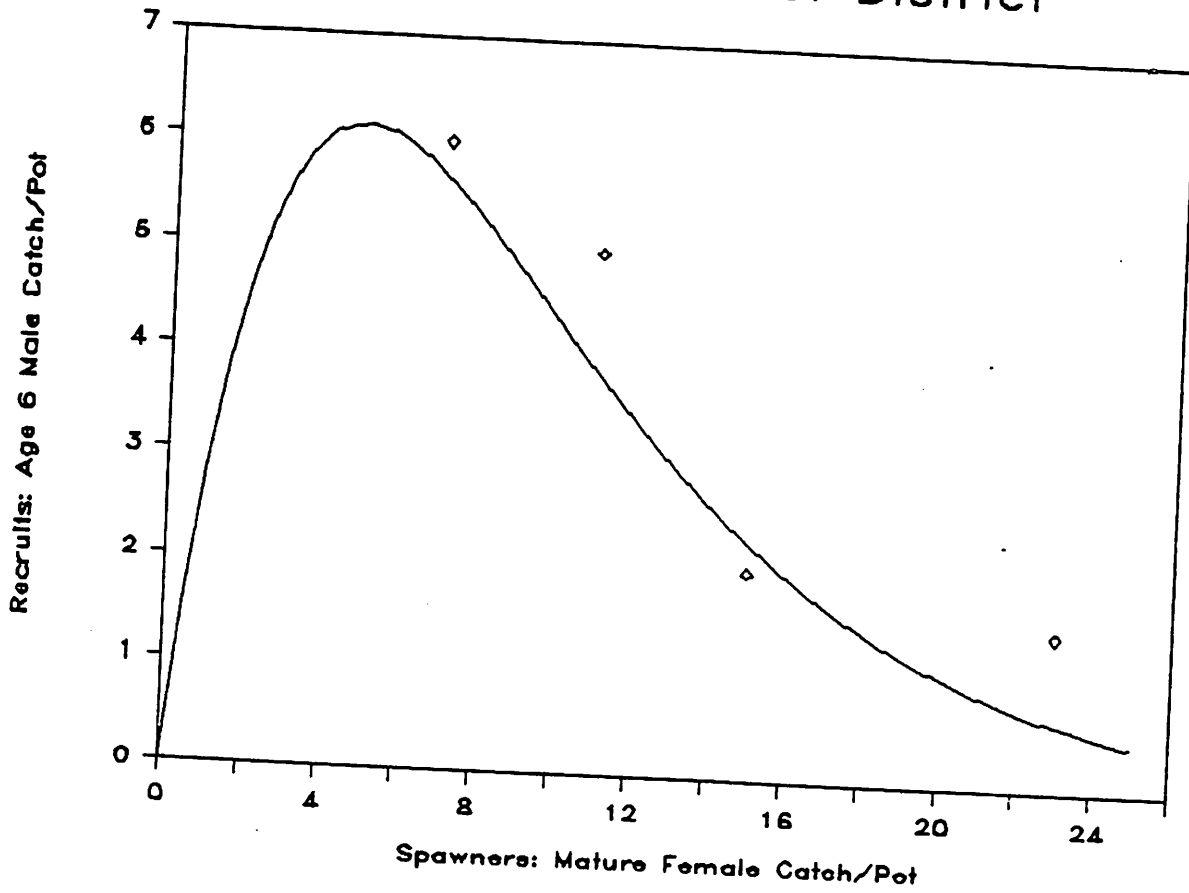
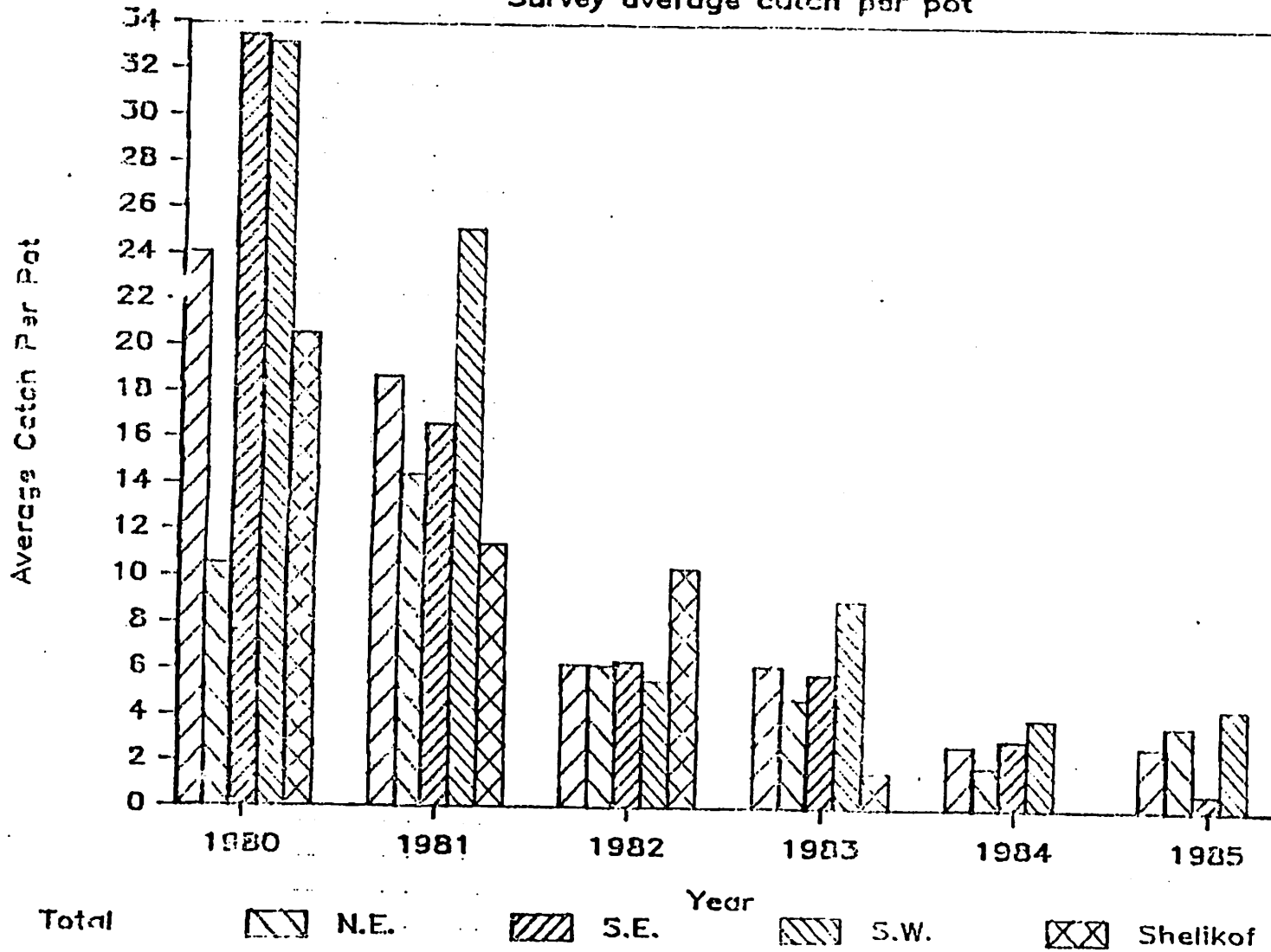


Figure 4.--Spawner recruit relationship determined from Kodiak Northeast District king crab pot surveys.

Figure 5.

# Kodiak Districts Female Red King Crab

Survey average catch per pot



20

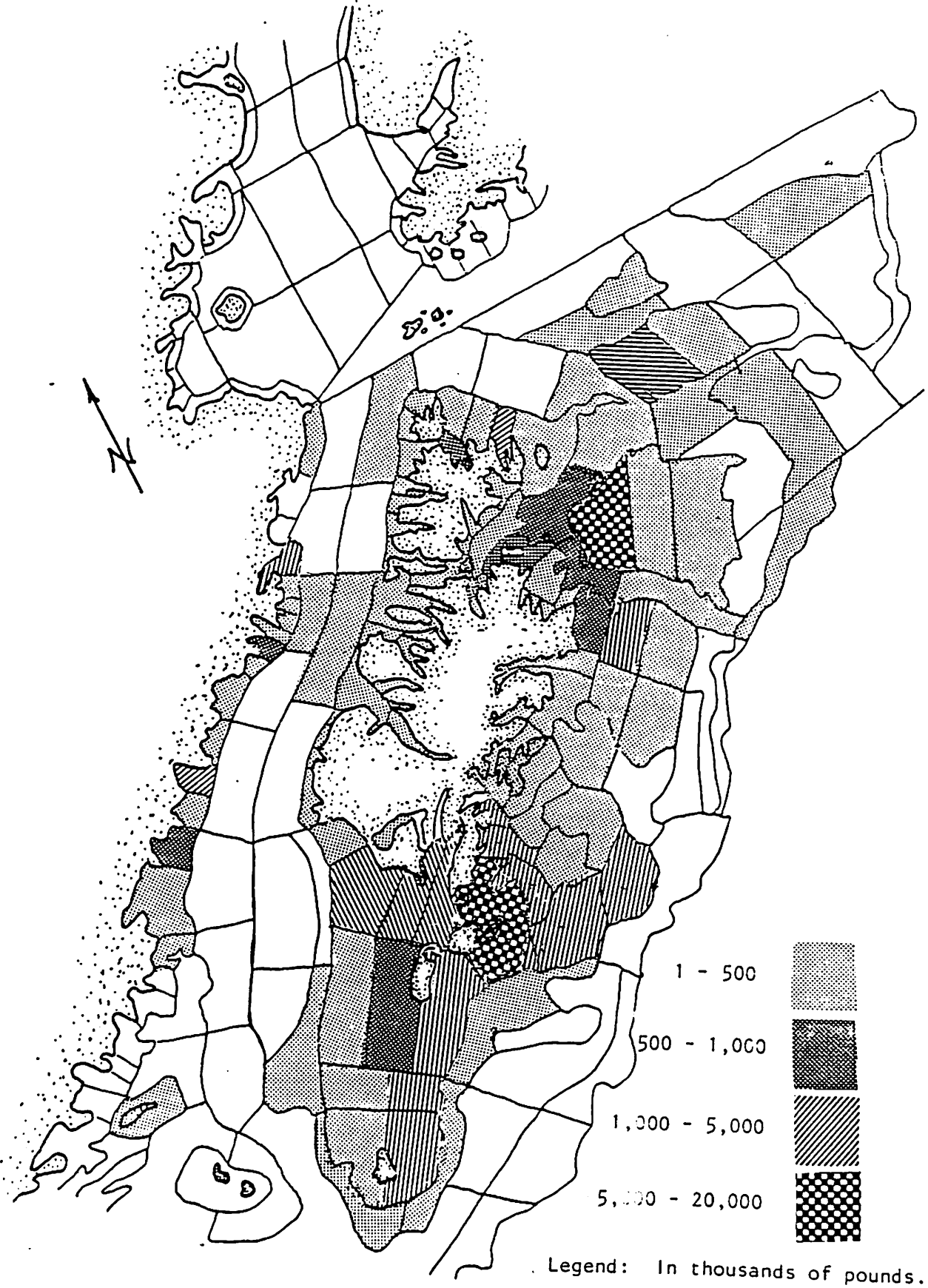


Figure 6 Combined 1960-1968 Kodiak area February through May king crab catch summary by statistical subarea. Differential shadings indicate total catch categories as shown in legend.

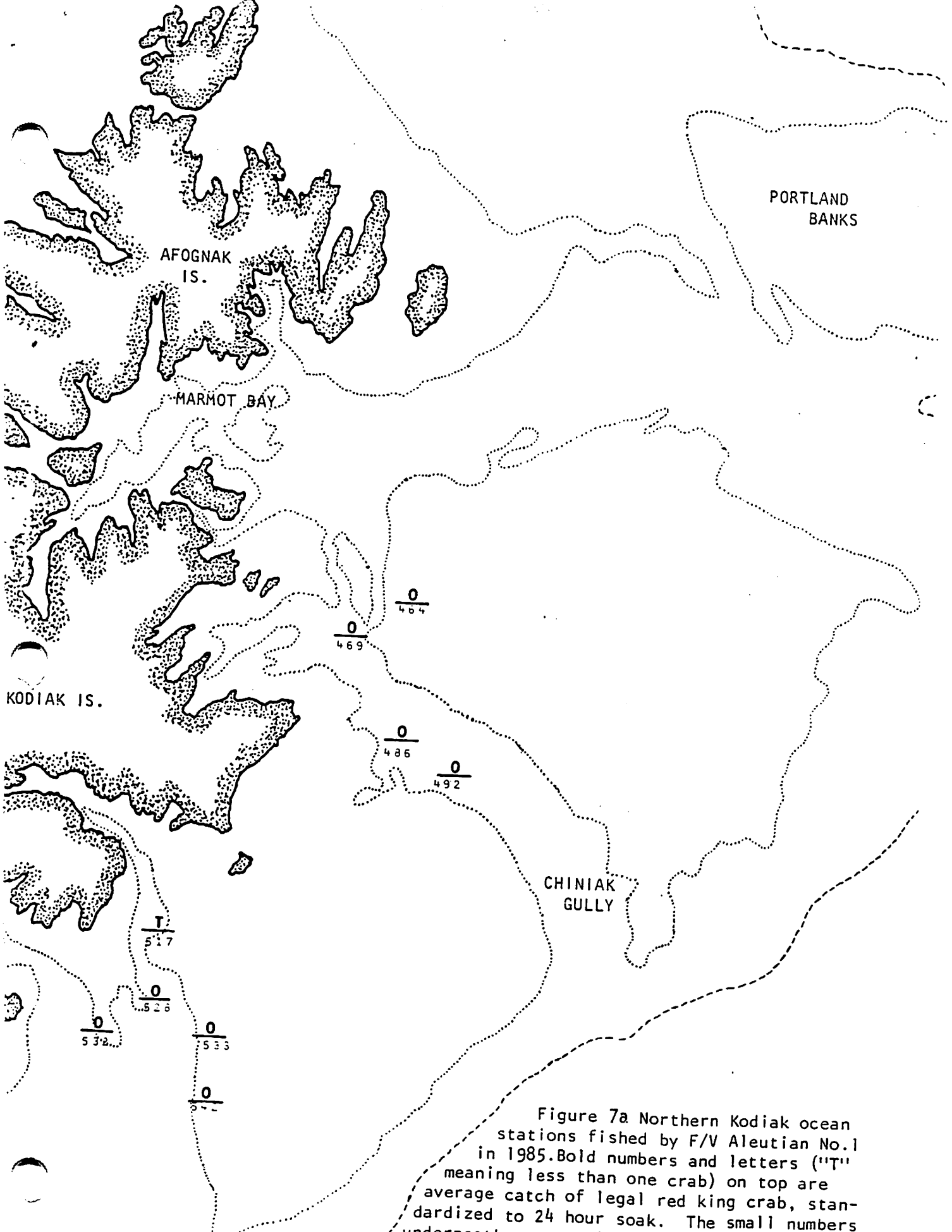


Figure 7a Northern Kodiak ocean stations fished by F/V Aleutian No. 1 in 1985. Bold numbers and letters ("T" meaning less than one crab) on top are average catch of legal red king crab, standardized to 24 hour soak. The small numbers underneath are station numbers.

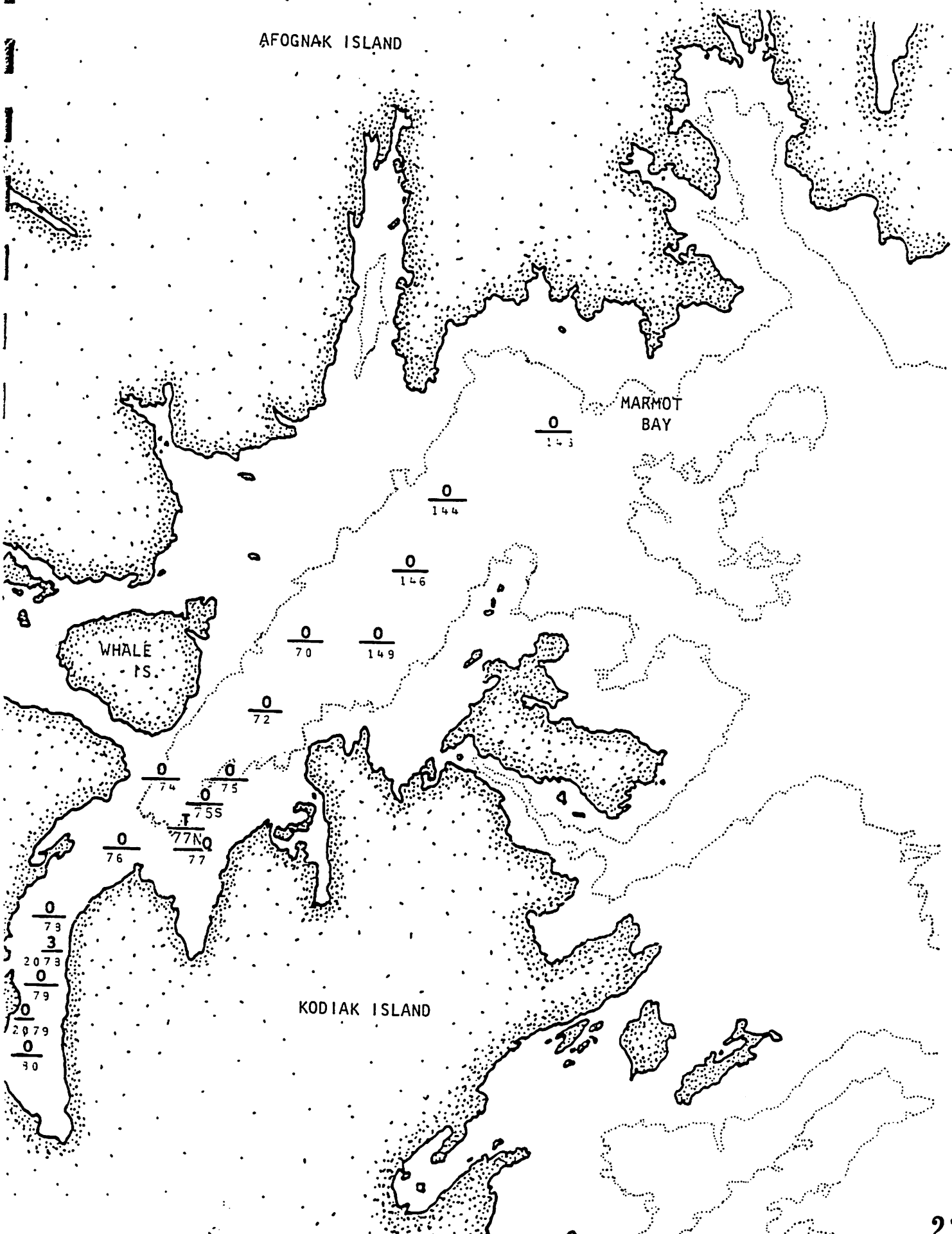


Figure 7h. Marmot, Kizhuyak Bay stations fished by F/V Alouette No. 1, 1985



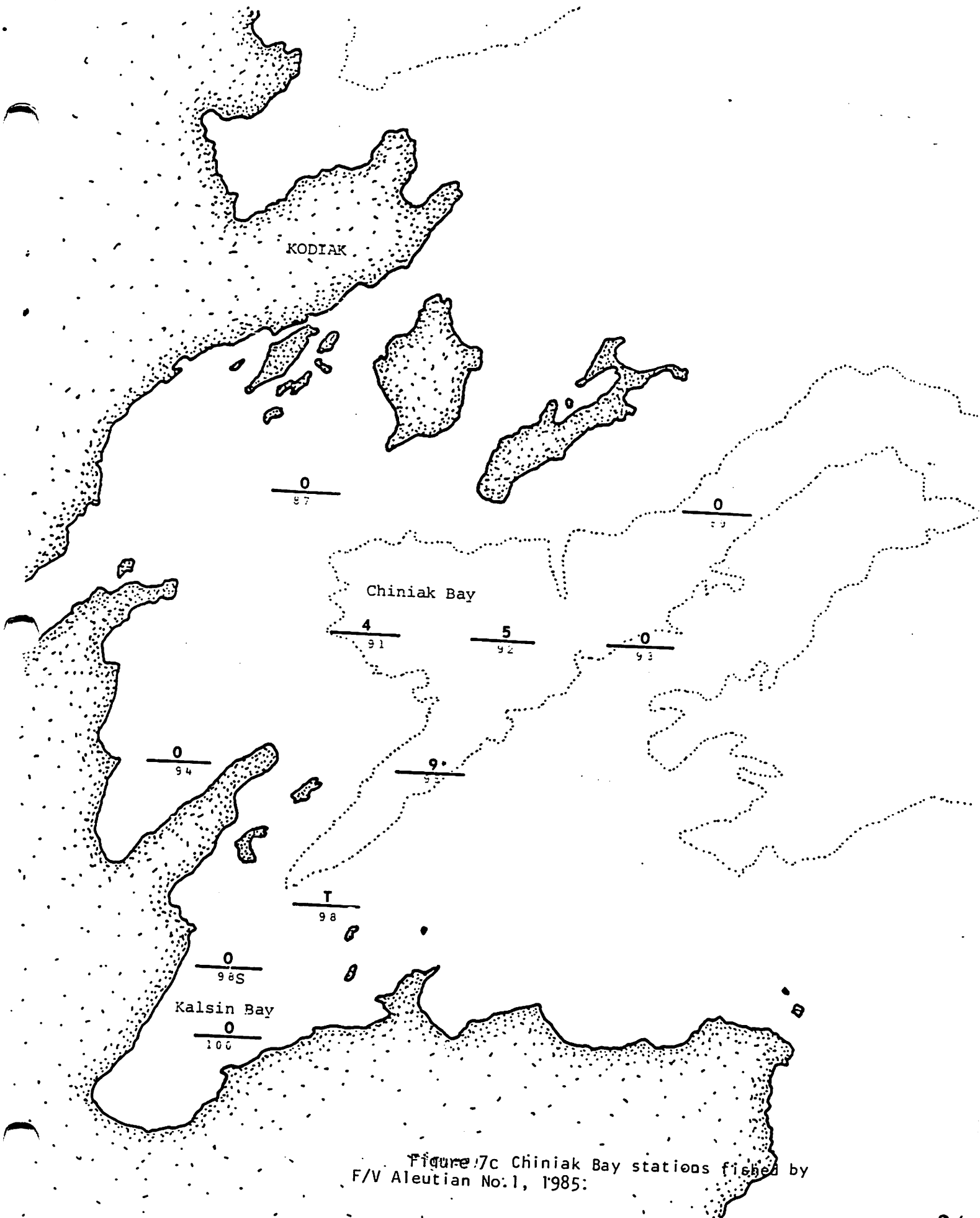


Figure 7c Chiniak Bay stations fished by F/V Aleutian No.1, 1985:

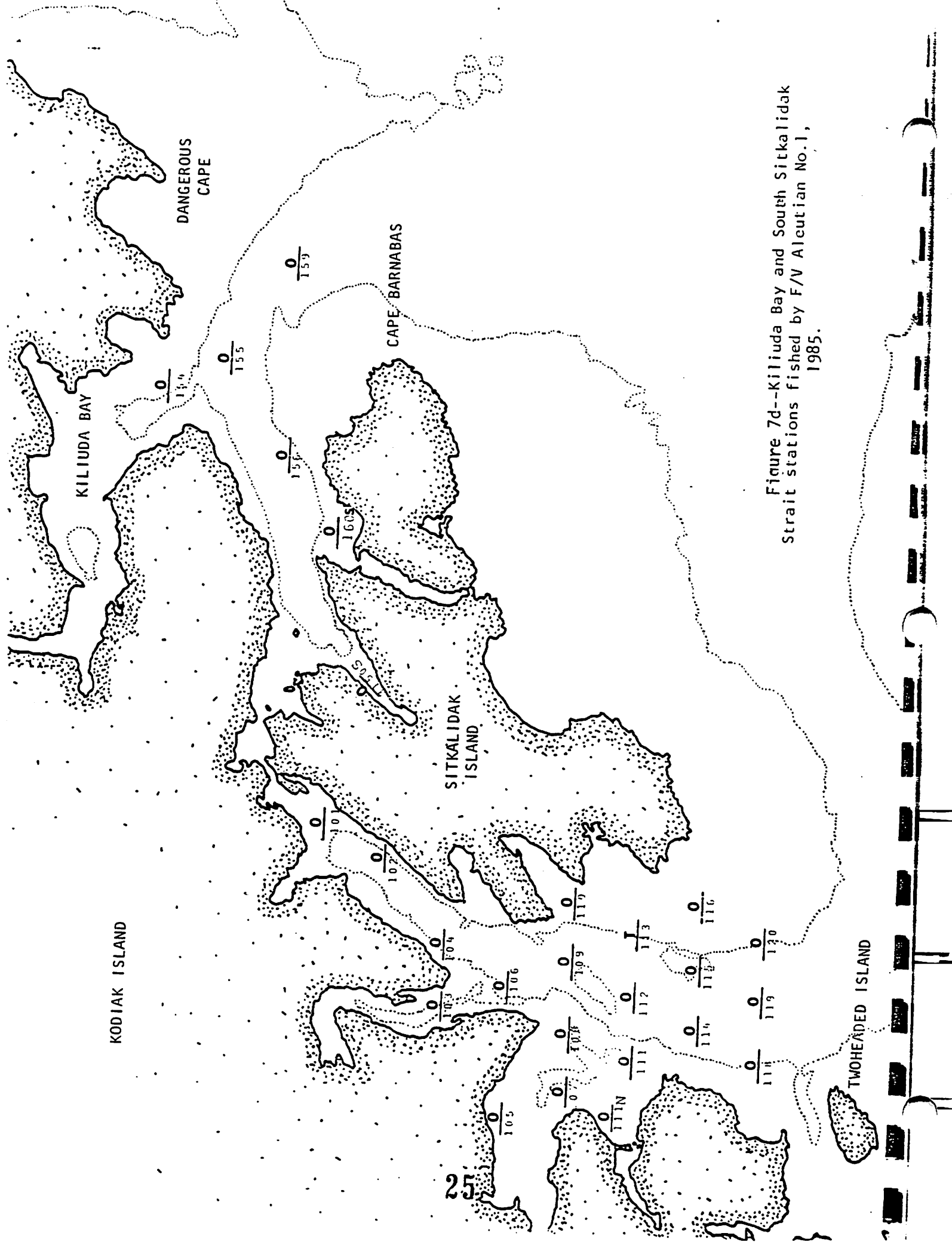


Figure 7d--Kiliuda Bay and South Sitkalidak Strait stations fished by F/V Aleutian No.1, 1985.

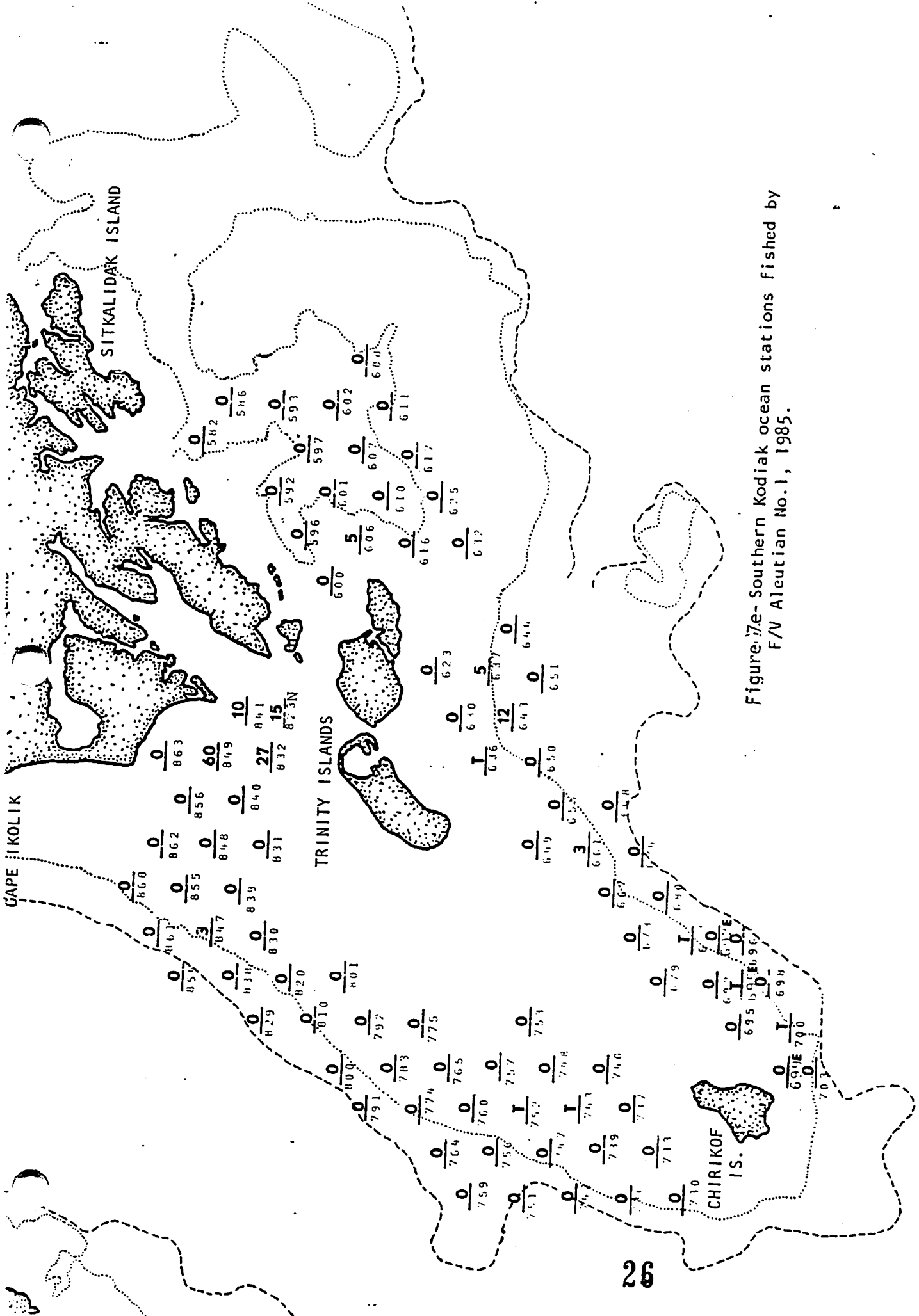


Figure 7e- Southern Kodiak ocean stations fished by F/V Aleutian No.1, 1985.

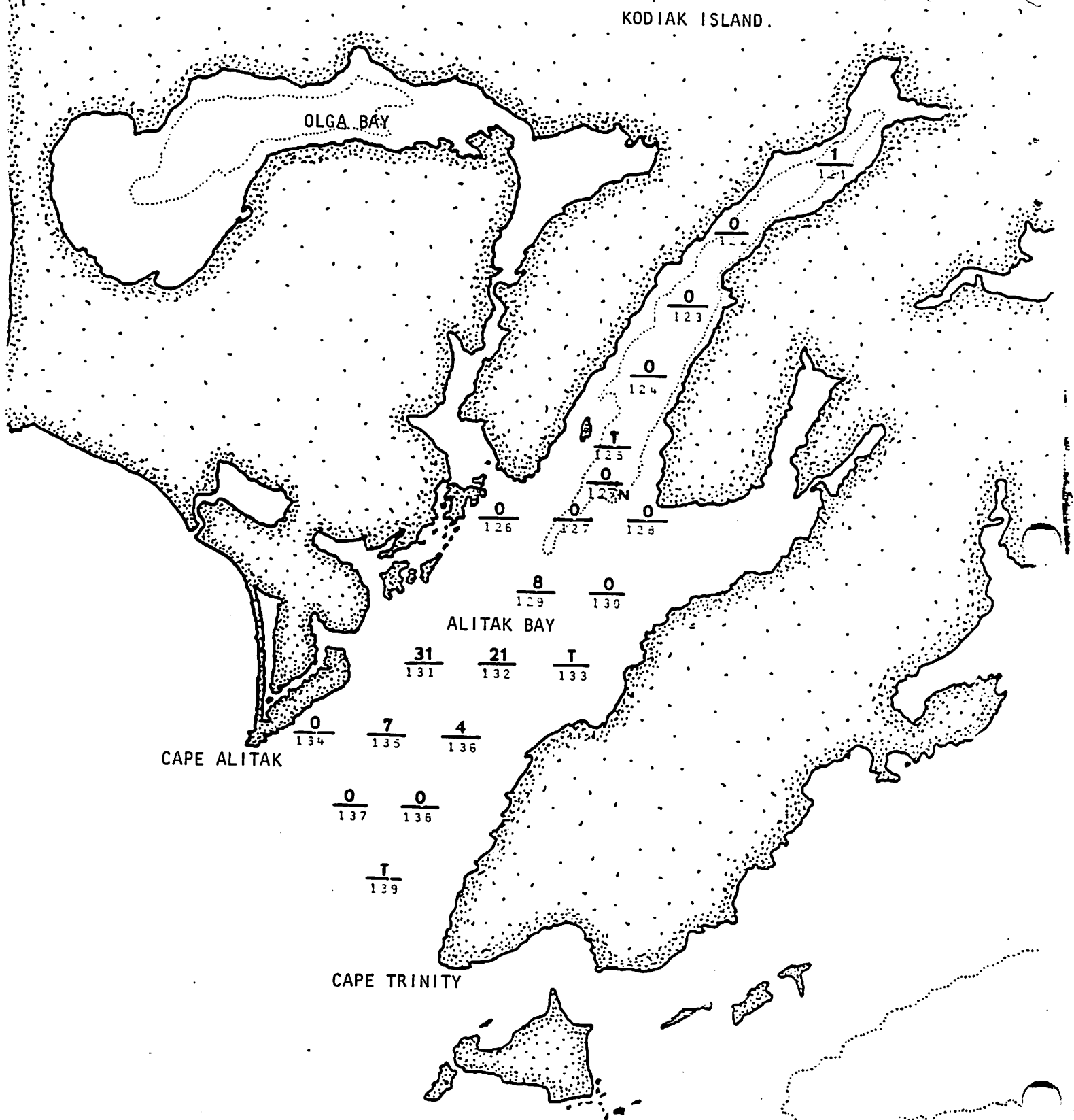


Figure 7f--Alitak Bay stations fished by F/V Aleutian No. 1, 1985.

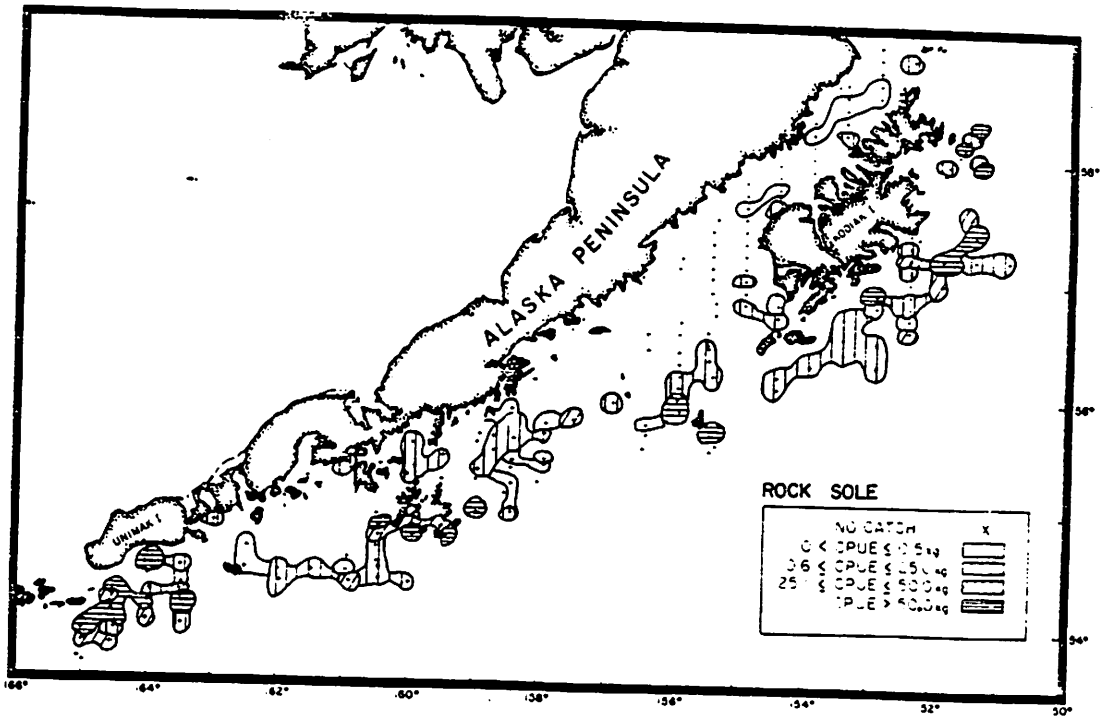


Figure 8a. ---Distribution of apparent relative abundance of rock sole in the western Gulf of Alaska, Aug.-Nov. 1961 (Cruise 619).

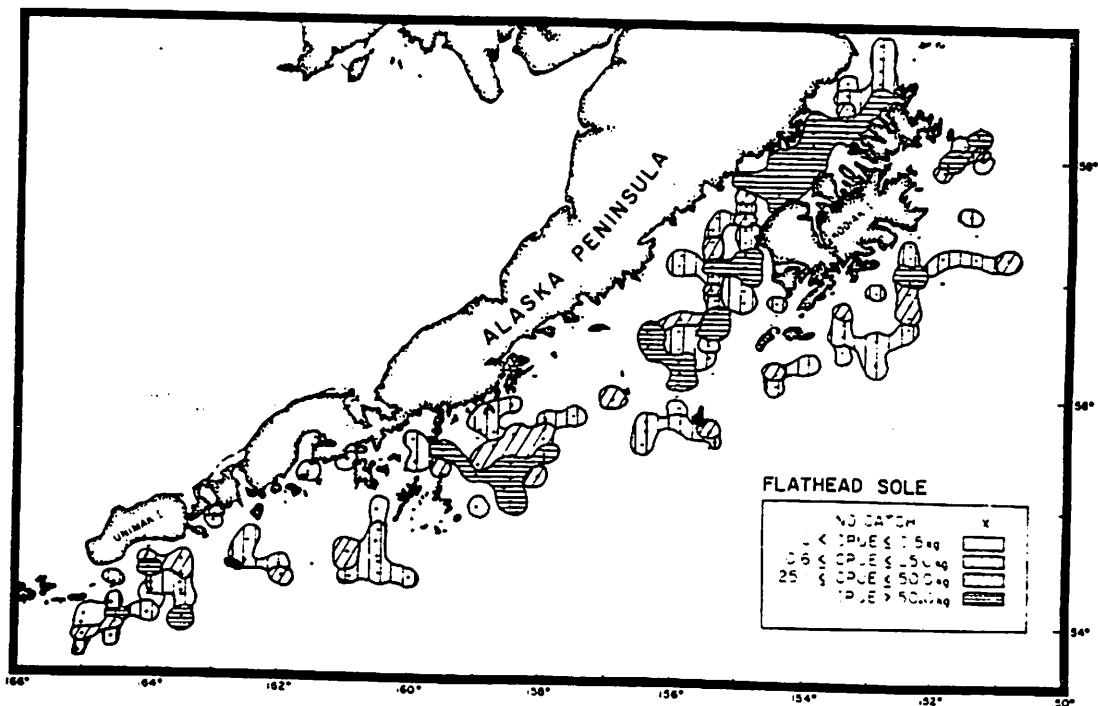
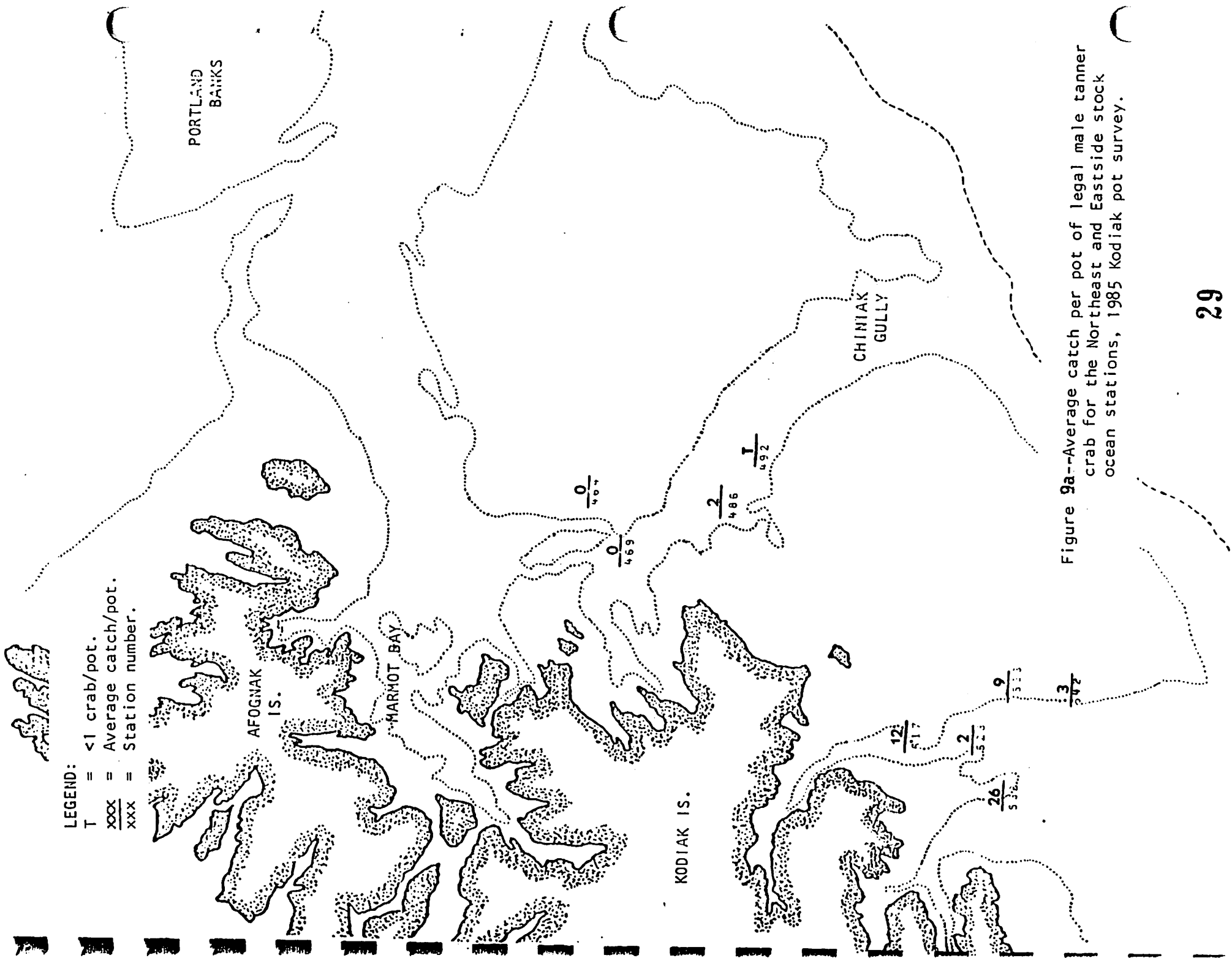


Figure 8b. ---Distribution of apparent relative abundance of flathead sole in the western Gulf of Alaska, Aug.-Nov. 1961 (Cruise 619).



LEGEND:

- T = <1 crab/pot.
- xxx = Average catch/pot.
- xxx = Station number.

Figure 9a--Average catch per pot of legal male tanner crab for the Northeast and Eastside stock ocean stations, 1985 Kodiak pot survey.

LEGEND:

- T = <1 crab/pot.
- xxx = Average catch/pot.
- xxx = Station number.

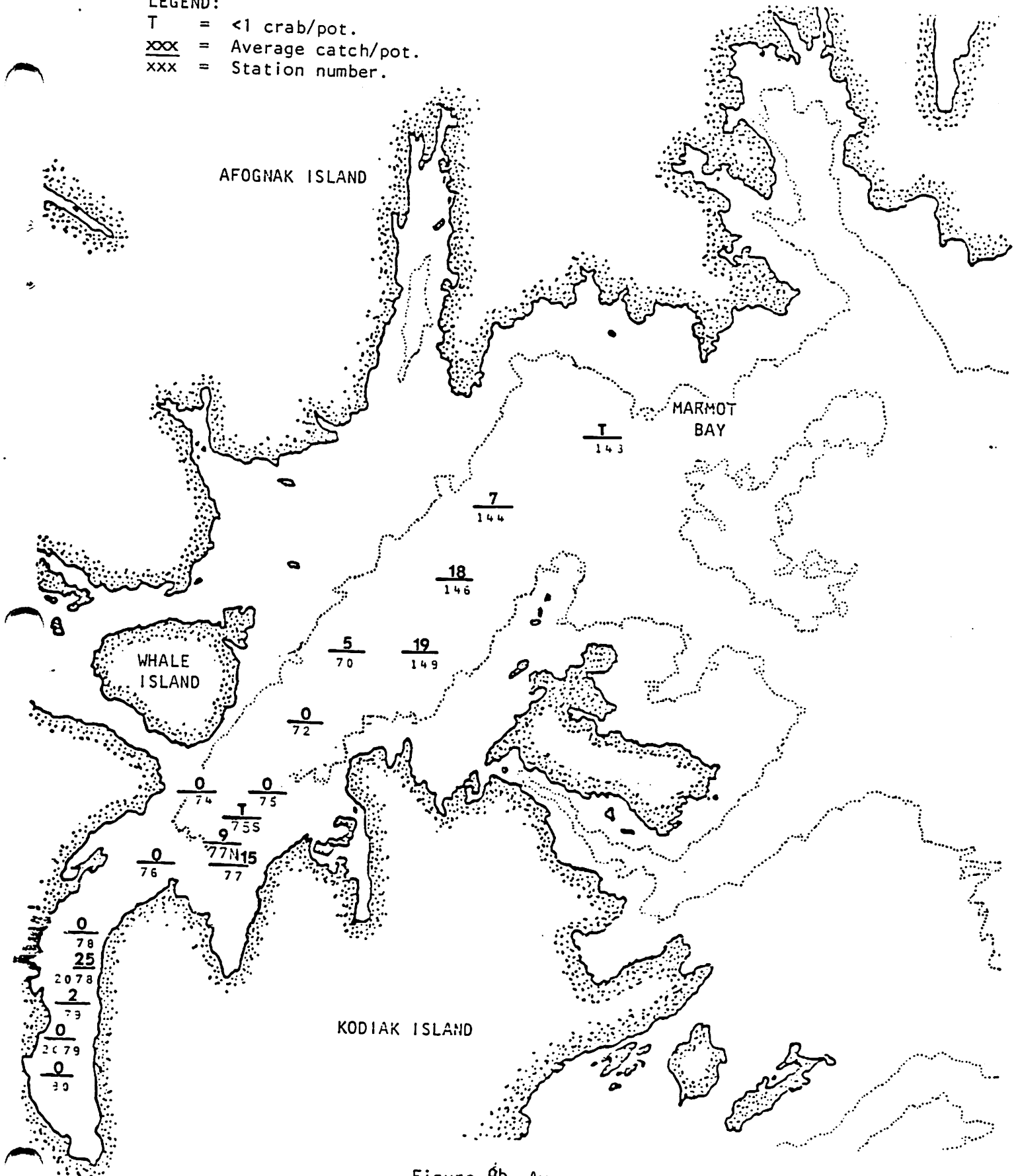


Figure 9b. Average catch per pot of legal male tanner crabs for Marmot Bay, 1985 Kodiak pot survey.

LEGEND:

- T = <1 crab/pot.
- xxx = Average catch/pot.
- xxx = Station number.

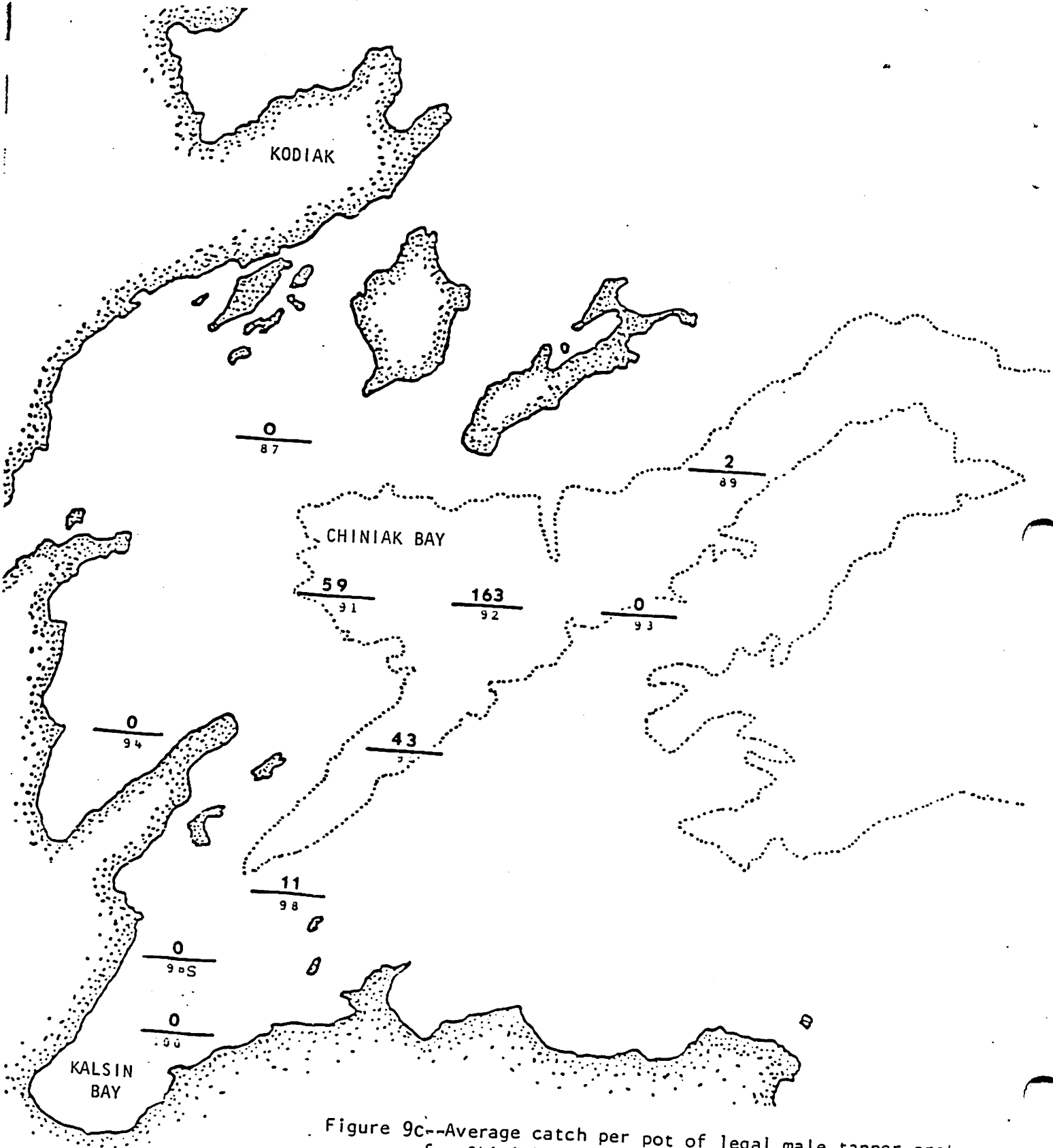


Figure 9c--Average catch per pot of legal male tanner crabs for Chiniak Bay, 1985 Kodiak pot survey.



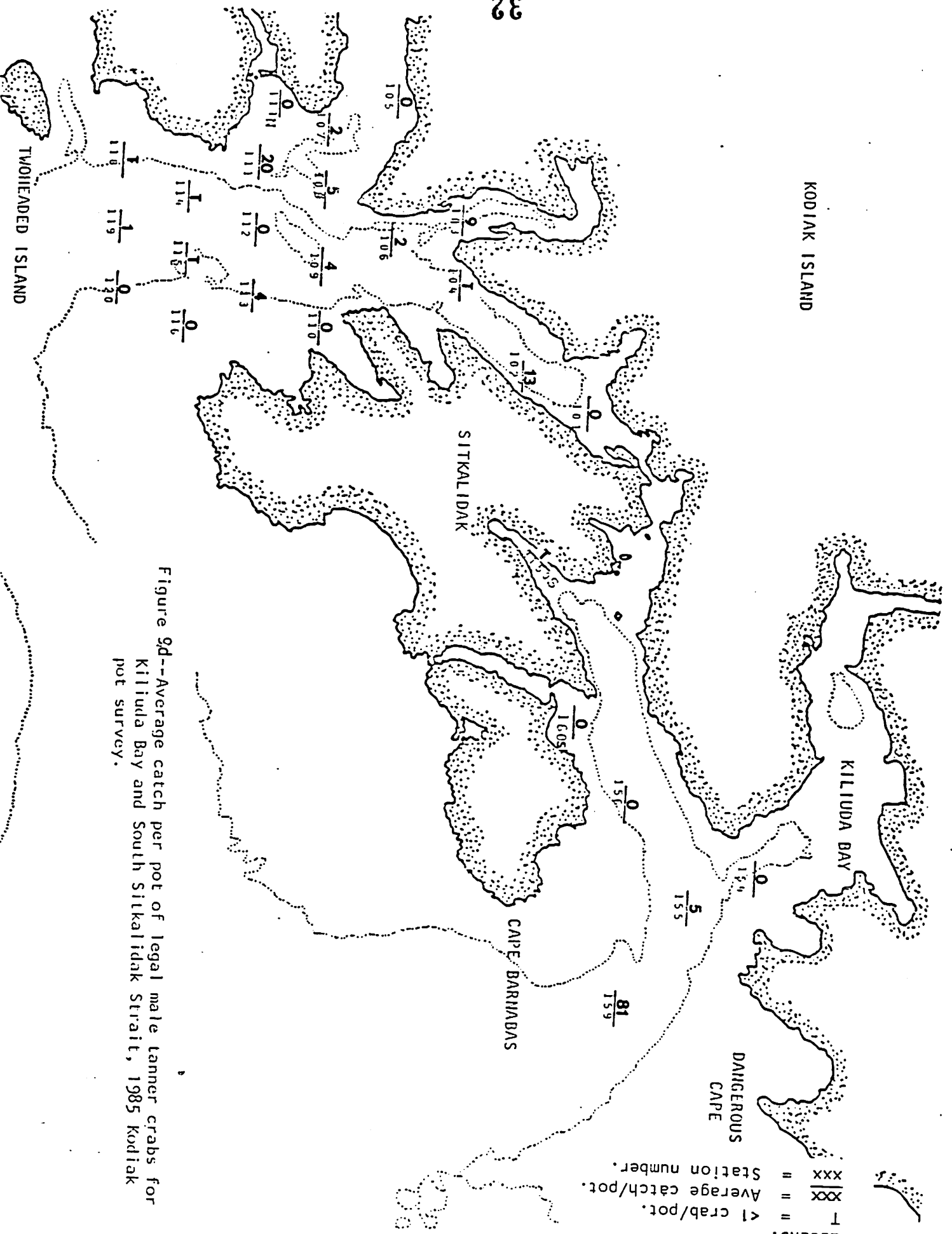


Figure 9d--Average catch per pot of legal male Tanner crabs for Kiliuda Bay and South Sitkalidak Strait, 1985 Kodiak pot survey.

LEGEND:  
 T = <1 crab/pot.  
 XX = Average catch/pot.  
 XXX = Station number.

KODIAK ISLAND

SITKALIDAK

CAPE BARHADAS

KILIUDA BAY

DANGEROUS CAPE

TWOHEADED ISLAND



LEGEND:

- T = <1 crab/pot.
- xxx = Average catch/pot.
- xxx = Station number.

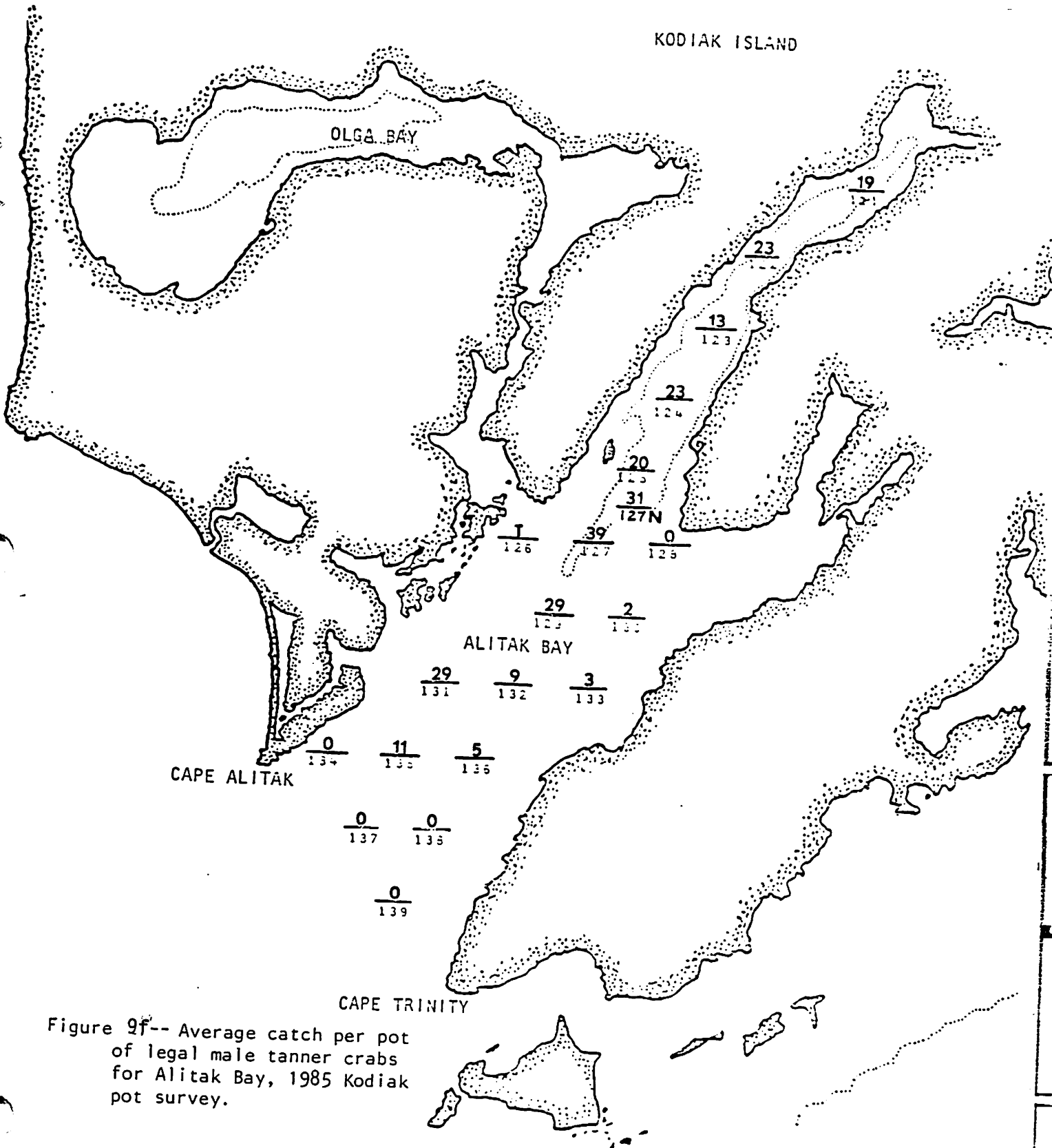


Figure 9f-- Average catch per pot of legal male tanner crabs for Alitak Bay, 1985 Kodiak pot survey.

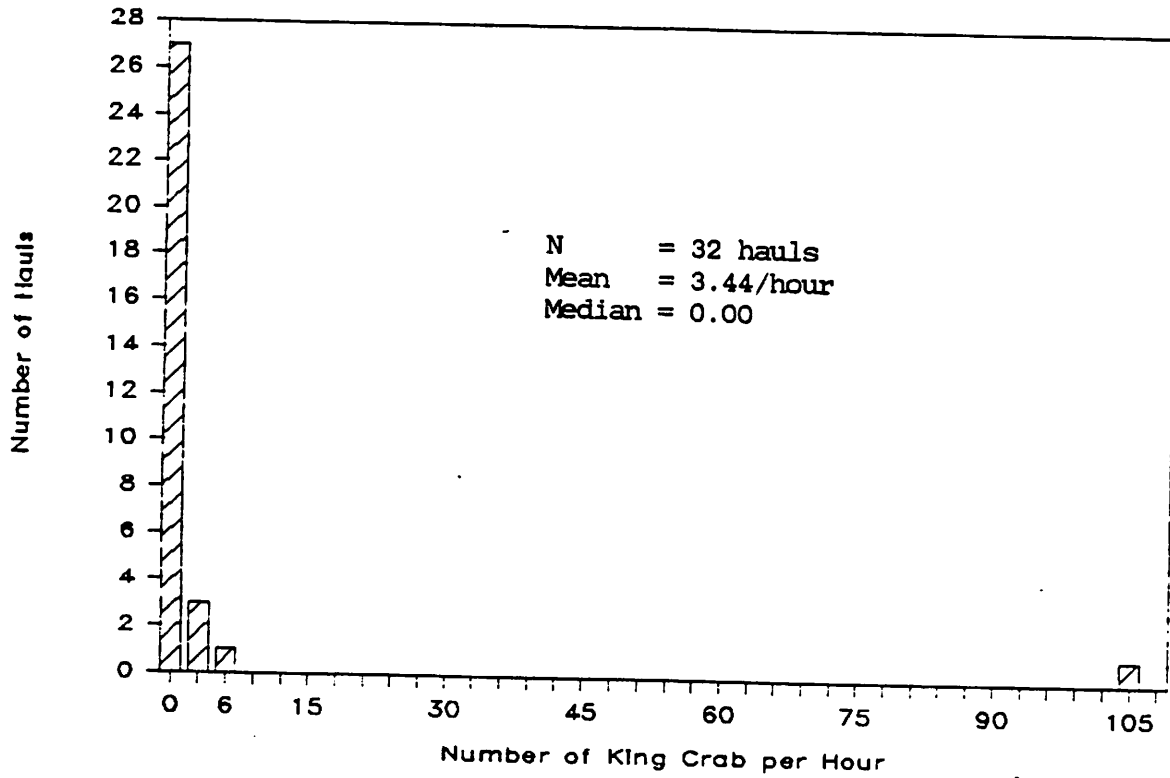


Figure 10--- Frequency distribution of king crab CPUE from observed groundfish trawls off the northeast side of Kodiak Island in December 1985.

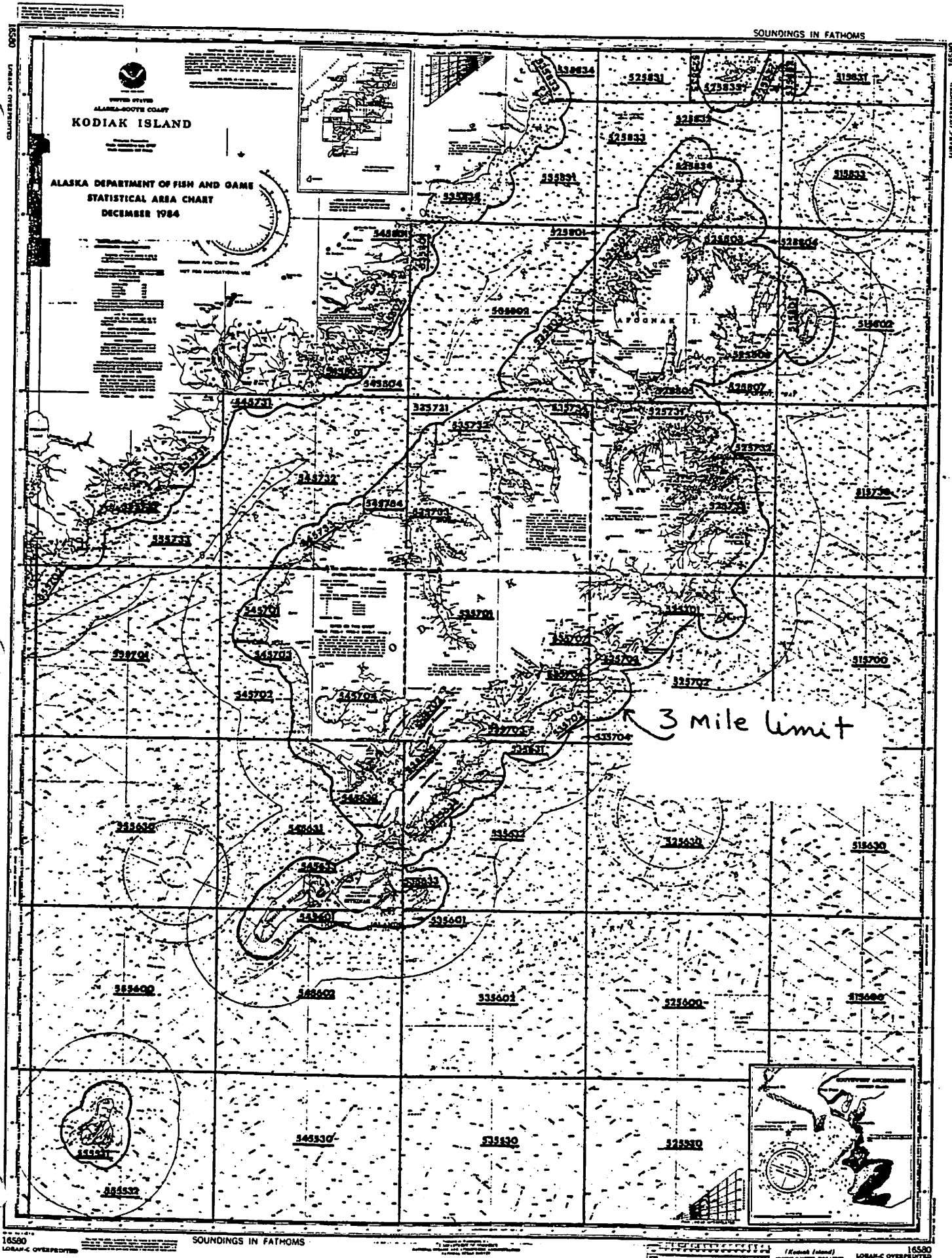


Figure 11--The three mile territorial sea around Kodiak Island.

# KODIAK SCALLOP SEASONS

JUNE 1 -  
MARCH 31

JULY 15 -  
MARCH 31

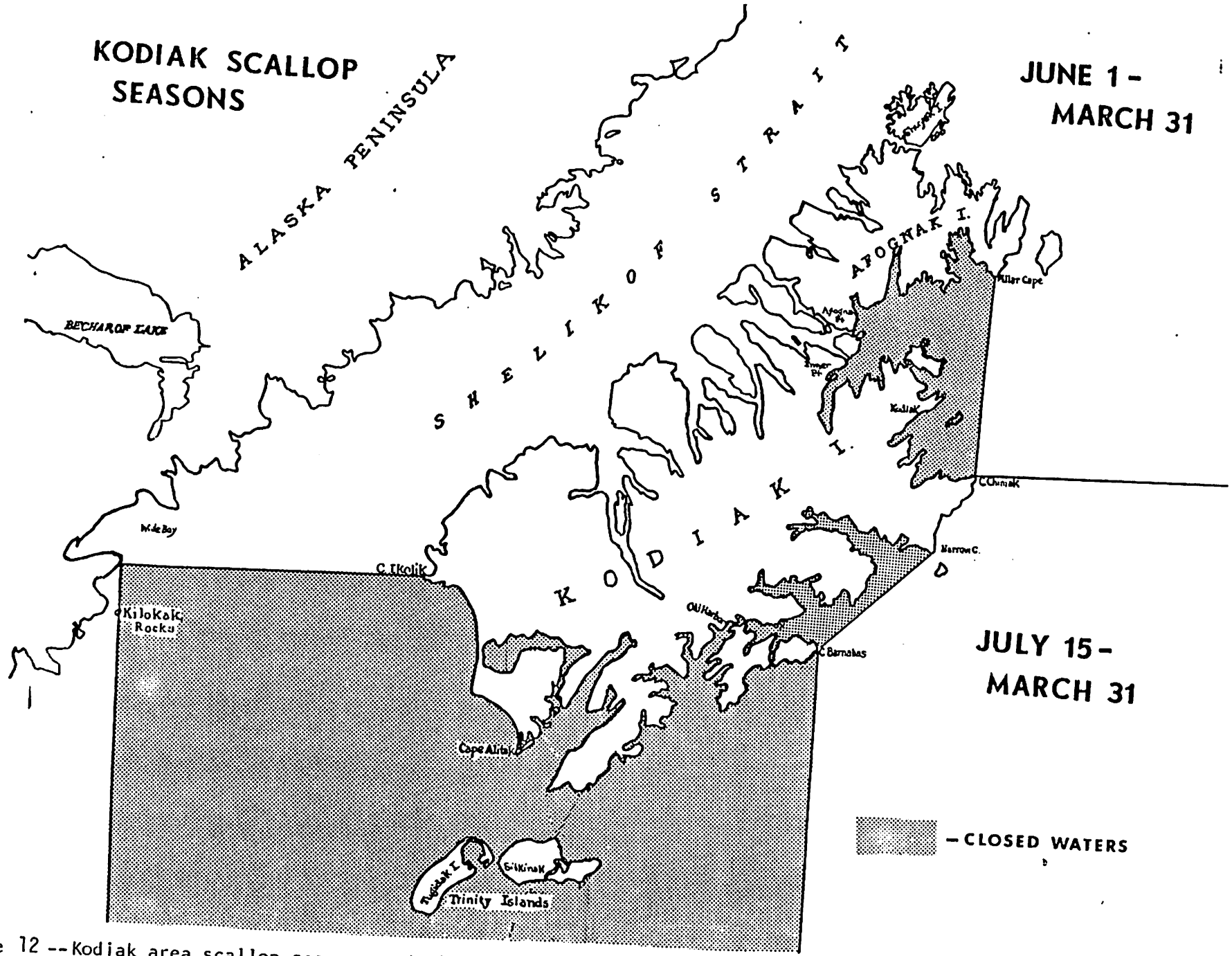


Figure 12 -- Kodiak area scallop seasons and closed waters.

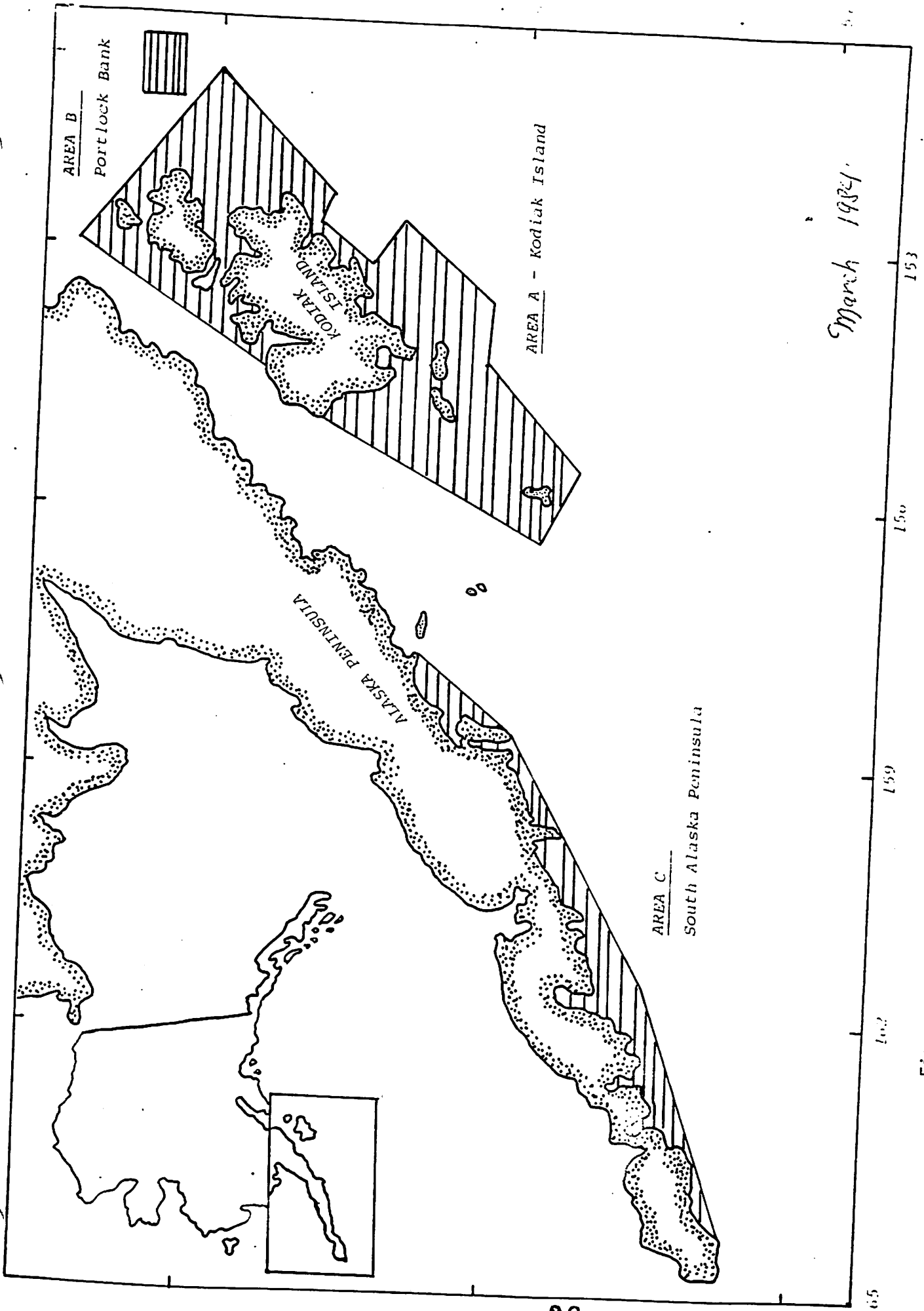


Figure 13 Definition of king crab habitat areas in the Gulf of Alaska.





Table 2. Summary of king crab bycatch rates and target species from ADF&G domestic groundfish observer samples from fishing grounds around Kodiak Island, 1978-1984.

Kodiak Fishing Grounds	Month	Year	No. Obs. Tows	Per Cent Target Species			King Crab Per Ton	
				P. Cod	Pollock	Flounder		
Northwest:	Uyak-Malina Bay	Feb	79	2	5%	95%	N. A.	0.0
		Mar	79	14	7%	93%	N. A.	0.7
	(Inshore)	Apr	78	43	13%	87%	N. A.	15.0
		Apr	79	9	18%	82%	N. A.	0.5
	(Inshore)	May	78	31	7%	93%	N. A.	40.1
		May	79	7	15%	85%	N. A.	0.4
							1	
	Kupreanof-Off	Mar	84	15	81%	N. A.	19%	0.0
	-shore	Apr	84	6	75%	N. A.	25%	0.0
		May	84	17	66%	N. A.	34%	0.0
	Uyak Bay	Mar	84	9	80%	N. A.	20%	0.0
		Apr	84	14	78%	N. A.	22%	0.0
	Karluk-Inshore	Mar	84	1	3%	N. A.	97%	26.3
	Malina-Offshore	Mar	84	2	79%	N. A.	21%	0.0
		Apr	84	2	63%	N. A.	37%	0.0
Northeast:	Portlock Bank	Apr	79	9	3%	97%	N. A.	0.0
	Marmot Bay	Apr	84	31	31%	N. A.	69%	0.0
		May	84	5	37%	N. A.	63%	0.2
	Marmot Flats	Apr	84	9	51%	N. A.	49%	82.6
	Portlock Bank	Mar	84	5	11%	N. A.	89%	0.0
	Chiniak-Offshor	Mar	84	3	9%	N. A.	91%	0.0
Southeast:	Sitkalidak Bay	May	79	19	88%	12%	N. A.	6.7
		Jul	79	25	6%	94%	N. A.	18.6
		Nov	78	11	95%	5%	N. A.	2.6
		Dec	78	9	94%	6%	N. A.	44.4
	Barnabas	Mar	84	22	93%	N. A.	7%	0.0

Footnotes:

1. Species occurred in the catch but was not targetted.

Table 3. Observed incidental catch in the 1984 Kodiak Tanner Crab Fishery, from ADF&G observer trips between February 13 and March 13, 1984.

Species/Sex	Number Caught	Catch Per Pot	% Total Catch by Number	Comments
Tanner/Legal Male	16233	39.0	51.7%	
Tanner/Sublegal Male	12871	31.0	41.0%	
Tanner/Female	1166	3.0	3.7%	
King/Male	86	.2	.3%	No soft shells or injured crab observed. All king crab premolt.
King/Female-ovigerous	898	2.0	2.9%	
Halibut	47	1.0	.1%	
Pacific cod	93	.2	.3%	
	-----			
Total	31394			

Total Pots sampled 416

Attachment 1



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
P.O. Box 1668  
Juneau, Alaska 99802

June 11, 1984

Dist.

Gaffney, Clasby, Nichols

Mr. Kenneth P. Parker  
Acting Director  
Division of Commercial Fisheries  
Alaska Department of Fish and Game  
P.O. Box 3-2000  
Juneau, AK 99802

Dear Mr. Parker:

Thank you for your letter of May 14, summarizing the information available regarding the trawl fishery/king crab conflict in the Marmot Flats area off Kodiak Island. The information was most helpful to us in assessing the nature and gravity of the conflict. It is our view that had a real threat of substantial trawling in that area arisen during the critical mating/molting period described in your letter, a federal emergency closure would have been justified. Both the Washington, D.C. office of the National Marine Fisheries Service (NMFS) and the NOAA Office of General Counsel concur.

No doubt you are aware that it is federal policy to avoid unnecessary regulation of industry. The success of the "gentlemen's agreement" by the Kodiak trawlers to avoid the sensitive area is encouraging - we appreciate both the willingness of the Alaska Department of Fish and Game (ADF&G) to co-operate with the fishing industry and the evident concern of the trawlers themselves. Of course we recognize that the agreement could have failed, or that in future such an amicable arrangement might not materialize. Under such circumstances, we would like to be able to respond as quickly as possible.

Your documentation of the recent conflict was most helpful in that regard. The area finally proposed for closure was substantially smaller than the area first proposed. Also, the time period of the proposed closure was short. Each of these factors would minimize any negative impacts which the closure might have on trawlers, and would facilitate the justification of the action under the Magnuson Act and other applicable law. The data collected by the ADF&G observer suggest a substantial incidental harvest of king crab during the observed trawl hauls, and your analysis shows that the economic loss due to mortality of crabs so intercepted may well exceed the value of target species caught. Historical data presented state that the area proposed to be closed is a known breeding area, and that it has been a substantial contributor to the king crab fishery in the Kodiak area. All of these factors support the proposed closure.



While king crab harvest data and population estimates for the area in question are remarkably detailed, data on groundfish harvests and populations appear to be almost nonexistent. Burdens must be weighed against benefits in evaluating federal regulations, and the Magnuson Act requires the use of the best scientific information (both socioeconomic and biological) in the development of regulations. The best scientific information may be virtually nonexistent, but it is well to explain why.

In that context I should mention that everyone who read your presentation found it convincing. In addition, for the purpose of compiling an administrative record, it would be well for you to be prepared to present for our review the aggregate data upon which your findings are based (summaries of fish ticket submissions, written observer reports, etc.). This would enable us to assess the likely outcome of any lawsuit which might result from federal regulatory action - a consideration which we always take into account.

The NMFS Washington, D.C. office promised expedited review of any emergency rule which might be submitted to avoid substantial harm to king crab stocks in the Marmot Flats area. Nevertheless, it is likely that the preparation, review and filing of such a regulation with the Federal Register would take ten days. It would be most helpful if you would keep us posted as to developments in the Marmot Flats or any other sensitive area. We would then be in a position to "grease the skids" for an emergency action.

The NMFS Alaska Region intends to prepare a regulatory amendment for the Gulf of Alaska groundfish fishery which would give the Regional Director field order authority to close all or part of the fishery conservation zone in the Gulf to trawling for groundfish where substantial harm to crab stocks is threatened. Implementation of such an amendment would facilitate closures based largely on biological data relating to the condition of crab stocks.

I look forward to further co-operation between our agencies in this matter.

Sincerely,



Thorn Smith  
Acting Chief  
Fishery Management  
Operations Division

cc: Al Burch  
Jeff Stephen

May 14, 1984

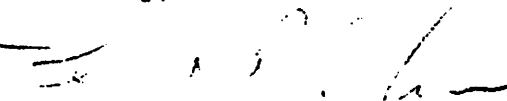
Mr. Thorn Smith  
National Marine Fisheries Service  
P. O. Box 1668  
Juneau, AK 99802

Dear Mr. Smith:

While discussing the bottom trawl fishery/king crab conflict in the Marmot Flats area off Kodiak with Bob Clasby, you suggested that the division prepare a rough summary of the information available to us and submit it to you for analysis. The idea would be that the information paper could be used by you as a "straw man" for evaluation of the type of data that could be available if the National Marine Fisheries Service were to need a justification for closing the bottomfish trawl fishery to protect king crab stocks.

After much delay, due to loss in the mail, we have finally received the document you requested and it is enclosed. I would appreciate your review and comments, particularly items that need to be strengthened, realizing that it may be difficult to impossible to gather additional data.

Sincerely,



Kenneth P. Parker  
Acting Director

Enclosure

cc: Pennoyer  
Clasby  
Nicholson

M E M O R A N D U M

TO: Council, SSC and AP Members  
FROM: Jim H. Branson  
Executive Director  
DATE: January 8, 1986  
SUBJECT: Gulf of Alaska Groundfish Fishery Management Plan

ACTION REQUIRED

Receive status report on different approaches being developed by the plan team for frameworking OY. For information only.

BACKGROUND

The Council's Gulf of Alaska plan team subgroup met in Seattle on October 3-4 and in Anchorage on October 29-30, 1985 to review the results of the plan team's efforts to framework OY in the Gulf of Alaska. This frameworking amendment would be part of the Gulf of Alaska FMP rewrite.

The team has suggested three possible approaches to amending the plan so as to account for all catches, directed and nondirected, in the Gulf of Alaska. The three approaches are:

Method I (the target quota approach)

This approach uses bycatch rates observed in the fishery to calculate directed TACs. For example, using a hypothetical Pacific cod-sablefish fishery where the ABC for cod is 500,000 mt, the TAC for sablefish is 10,000 mt, the trawl share of the TAC for sablefish is 2,000 mt, and the bycatch rate of sablefish in the cod fishery is 1%, the target quota for Pacific cod is 200,000 mt (Table 1).

Table 1. An example of Method I.

ABC for cod = 500,000 mt  
TAC for sablefish = 10,000 mt (trawl share of sablefish TAC = 2,000 mt)  
Expected bycatch rate of sablefish in the cod fishery = 1%  
Target quota for cod = 2,000 mt/1% = 200,000 mt

Method II (the IPHC approach)

Method II is the approach that the IPHC uses for establishing halibut directed fishing quotas. In this method the bycatch amounts for each directed fishery are first calculated. In a second step the bycatch requirements calculated in Step 1 are subtracted from the directed fisheries' ABCs to produce a TAC for the directed fishery (Table 2).

Table 2. An example of Method II.

Sablefish ABC = 20,000 mt  
Sablefish PSC = True bycatch mortality + Rebuilding = 6,000 mt  
Sablefish TAC = ABC - PSC  
                  = 20,000 mt - 6,000 mt  
                  = 14,000 mt

Method II differs from Method I in that a bycatch is treated as a PSC.

Methods I and II are implemented as a computer spreadsheet.

Method III (the linear programming approach)

Method III uses a linear programming approach to determine an optimal set of directed and nondirected harvest allocations. The approach is implemented as a computer program which seeks the solution that provides the maximum exvessel revenue given certain constraints on the fishery. The constraints used are: (1) total catch for both the directed and nondirected fisheries should not exceed the TAC for that species; (2) harvest allocations to the various gear types in a directed fishery are fixed and are determined by the Council; (3) for each fishery the harvest allocation must be equal to or greater than a predetermined minimum allocation.

The plan team and Council workgroups will continue to analyze and refine these three approaches as part of the Gulf of Alaska FMP rewrite. A full presentation on the OY framework and other aspects of the plan is scheduled for the March meeting.

REC'D 11:106 in JUKA.

D-36  
1/16/86

KODIAK FISH & GAME ADVISORY COMMITTEE  
211 Mission Rd.  
Kodiak, Alaska 99615

January 4, 1986

North Pacific Fishery Management Council  
Box 103136  
Anchorage, Alaska 99510

Att: James O. Campbell, Chairman

Dear Mr. Campbell,

The Kodiak Fish & Game Advisory Committee met last night, January 3, for 4½ hours to hold elections of members and officers and to comment on ADF&G proposed time and area trawl closures in king crab sensitive areas. Also on the agenda was a report on the incidental harvest of prohibited species during a portion of the 1985 trawl fishery on the east side of Kodiak Island. Seventy six members of the community were present including ten ADF&G personnel, one F.W.P. officer and one Board of Fish member, Ron Jolin.

Approximately 2.5 hours were spent discussing a proposal by the Alaska Department of Fish & Game for specific time and areas closed to trawl fishing in order to protect Kodiak's rebuilding king crab stocks. The time of the closure discussed was between February 15 to June 15. A copy of the proposal is attached; however, the committee and fishermen present were told by the ADF&G staff that this may not be the final

The Kodiak Fish & Game Advisory committee voted 7-1-1 to accept the ADF&G proposal to close specific areas to hard on the bottom trawling from February 15 to June 15. David Harville cast the dissenting vote and Dan Campbell abstained from voting.

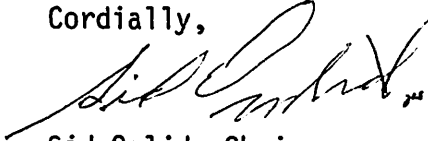
A decision on the closure lines needed to be made with short notice in order for the committee to forward its recommendations to the Alaska State Board of Fish members, so they could make recommendations to the N.P.F.M.C. The K.A.C. realizes there may be some changes in the closure lines or dates by the time a final regulation is in existence. By voting to accept this proposal the K.A.C. is expressing its strong concern in protecting Kodiak's king crab stocks and its intent that restrictions on trawl gear being operated in king crab sensitive areas need to be initiated.



January 4, 1986

The K.A.C. is not trying to discourage the development of a groundfish fishery in the Kodiak area, but instead wants to see a groundfish fishery develop with minimal impact on other valuable species such as king crab, tanner crab, salmon and halibut.

Cordially,

A handwritten signature in cursive script, appearing to read "Sid Omlid".

Sid Omlid, Chairman  
Kodiak Fish & Game Advisory Committee

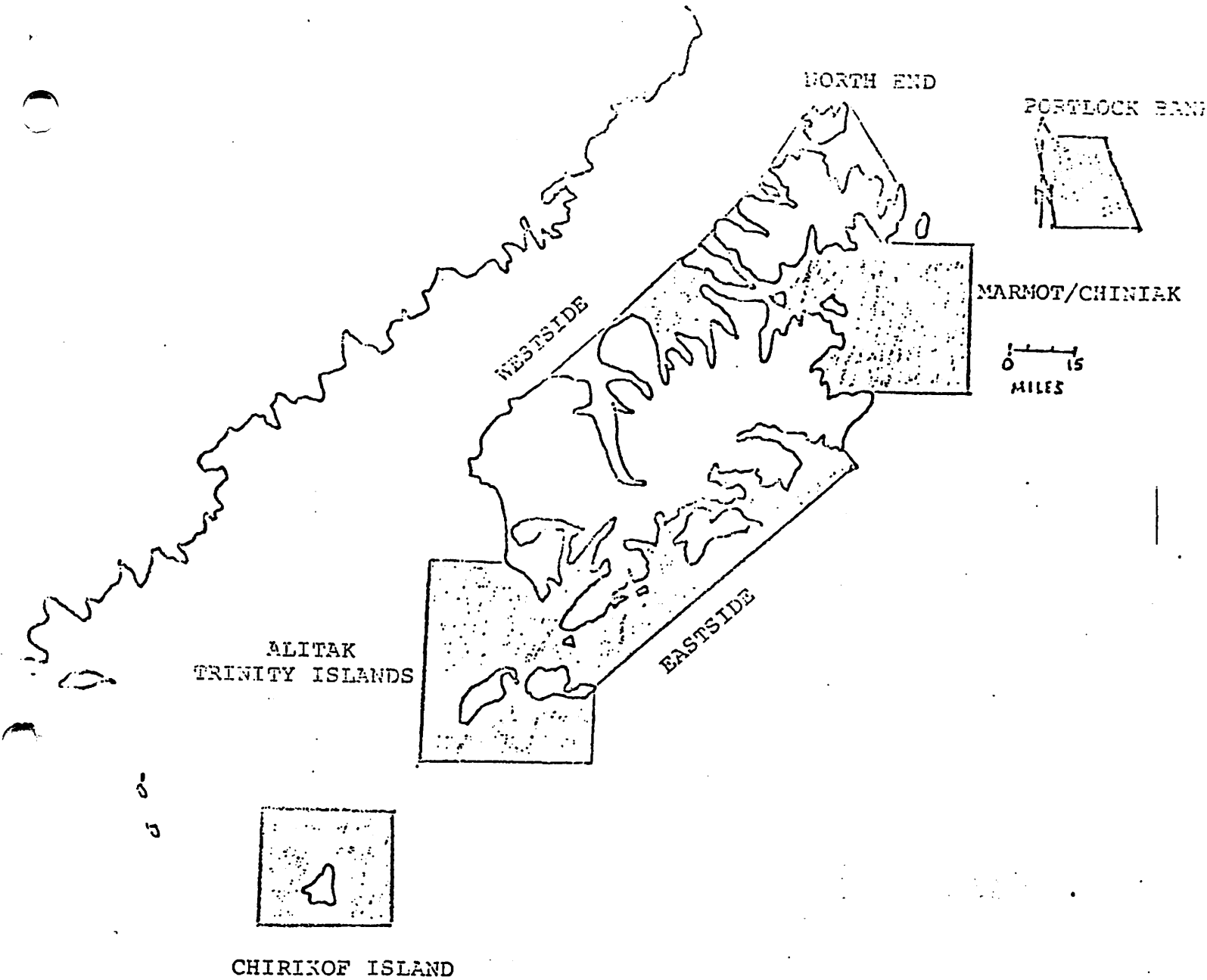


Figure 1. Proposed closed areas to hard-on-bottom trawling from February 15 to June 15, Kodiak Management Area.

Rec'd 1/14/86 - Sitka

D-3 b  
1/16/86

United Fishermen's Marketing Association, Inc.

P.O. Box 1035 Kodiak, Alaska 99615

Telephone 486-3453



January 13, 1986

Jim Branson  
North Pacific Fishery Management Council  
Sitka Centennial Building  
Sitka, Alaska

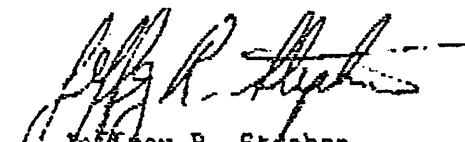
Dear Mr. Branson:

The United Fishermen's Marketing Association Inc. supports the recommendation of the Kodiak Fish and Game Advisory Committee regarding closures in the Kodiak Area to hard on bottom trawling. We have attached a description and a map depicting these areas. We strongly support emergency action to close these areas to hard on bottom trawling. We do not support any attempt to close these areas to pot fishing. There is no legitimate comparison between the use of pots and the use of hard on bottom trawl gear where negative impacts to king crab and critical habitat are concerned.

We request that the NPFMC act to protect king crab in critical areas in the Kodiak Area by adopting the action taken by the Kodiak Fish and Game Advisory Board.

We also voice our support for a total year around closure of the Bristol Bay Pot Sanctuary to hard on bottom trawling.

Sincerely,

  
Jeffrey R. Stephan  
Manager

Attachment

JRS/bb