MEMORANDUM

TO: Council, AP, and SSC Members

FROM: Clarence G. Pautzke
Executive Director

DATE: June 16, 1993

SUBJECT: Crab Management

ESTIMATED TIME

2.0 HOURS

ACTION REQUIRED

Review Alaska Board of Fisheries decisions and ADF&G crab management.

BACKGROUND

Bering Sea Crab Management

At the January 1993 meeting the Council requested a presentation at the April meeting on king and Tanner crab research and science and general management of the crab resources in the BSAI. Subsequent to this request, Dr. Gordon Kruse (ADF&G) presented a paper to the Alaska Board of Fisheries, titled "Biological Perspectives on Crab Management in Alaska" that provides a thorough review of crab management. You received a copy of this report in a March 1993 Council mailing. Dr. Kruse was not available in April, but is now to present his report to you. Attached as Item D-1(a) are copies of the report and slides from his presentation.

Alaska Board of Fisheries Crab Activities

In February 1993 the Alaska Board of Fisheries held its triennial meeting on statewide crab management and made several major recommendations for BSAI king and Tanner crab management, including: establishing a revised pot limit, changing season opening dates, and establishing superexclusive registration for the Norton Sound red king crab fishery. Attached as Item D-1(b) is a summary of this meeting from the Alaska Department of Fish and Game. Ken Griffin will present this report to the Council.

Item D-1(c) includes the Board of Fisheries' written explanations on two issues, the Norton Sound superexclusive registration decision and the BSAI crab pot limit decision. The Norton Sound superexclusive registration area decision has been controversial. If a vessel chooses to fish the Norton Sound king crab fishery, it cannot fish for king crab in any other king crab registration areas in Alaska. Under the BSAI crab FMP, registration areas are Category 2 measures, that are frameworked and can be changed by the State following criteria set out in the FMP. Item D-1(d) has the FMP provisions for registration areas.

On March 26, 1993, the Alaska Crab Coalition (ACC) submitted a petition to the Board of Fisheries to repeal the superexclusive registration decision because the ACC believes the FMP does not give the Board authority to establish a registration area as superexclusive. This petition for repeal is attached as Item D-1(e). The Board of Fisheries rejected this petition. Therefore, the crab FMP allows for the petition to be

reviewed by the Crab Interim Action Committee (CIAC) prior to being reviewed by the Secretary of Commerce. The CIAC met on Friday, June 18, 1993 to discuss this issue. The Norton Sound fishery begins on August 1.

Attached as Item D-1(f) is a report from the Pacific Northwest Industry Advisory Committee (PNCIAC) summarizing the Committee's April 6, 1993 meeting in which the group reviewed the recent Board of Fisheries decisions. Generally speaking, the PNCIAC expresses frustration regarding its effectiveness as an advisory body to the Board of Fisheries.

AGENDA D-1(a)
JUNE 1993

BIOLOGICAL PERSPECTIVES ON CRAB MANAGEMENT IN ALASKA: AN ORAL REPORT TO THE ALASKA BOARD OF FISHERIES

By
Gordon H. Kruse

Regional Information Report[1] No. 5J93-02
Alaska Department of Fish & Game
Division of Commercial Fisheries
P.O. Box 25526
Juneau, Alaska 99802-5526

January 31, 1993

[1]The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. . These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate timely reporting of recently collected information, reports in this series undergo only limited internal review and may contain preliminary data; this information may be subsequently finalized and published in the formal literature. Consequently, these reports should not be cited without prior approval of the author or the Division of Commercial Fisheries.

FORWARD

We thought that we would begin the Board meeting with an overview of biology and management of crabs in Alaska. This talk is similar to a presentation that I have given at a couple of recent scientific meetings. One meeting was the *International Symposium on Management Strategies for Exploited Fish Populations* in Anchorage during October 21-24, 1992, and the other was the annual meeting of the Alaska Chapter of the American Fisheries Society in Valdez, Alaska, during November 16-19, 1992.

The presentation is based on a scientific manuscript accepted for publication in the *Proceedings of the International Symposium on Management of Exploited Fish Populations* (Kruse 1992). This Regional Information Report constitutes a much less technical version of that scientific manuscript. In essence, it is meant to serve as a written transcript of the oral presentation delivered to the Alaska Board of Fisheries at its meeting in Anchorage during February 2-10, 1993. Copies of the presentation slides appear in the back of this report.

CRAB SPECIES

There are six primary species of crabs in Alaska that contribute to commercial landings [slide 1]. There are three species of king crabs: red *(Paralithodes camtschaticus)*, blue *(P. platypus)* and golden king crab, *(Lithodes aequispinus,* otherwise locally known as "brown" king crab). We have two species of the genus *Chionoecetes*: Tanner crab *(C. bairdi,* otherwise referred to as "bairdi") and the snow crab *(C. opilio,* otherwise referred to as "opilio"). You will sometimes hear the terms *bairdi* Tanner crab and *opilio* Tanner crab, but scientists prefer the "recognized" common names of Tanner crab and snow crab. Our sixth major commercial species is the Dungeness crab *(Cancer magister)*.

HISTORY OF FISHERIES

I'd like to give an overview of the history of landings for these six species. I'll be showing fives slides [slides 2-6]. In each case, I'd like to emphasize the trends in landings. Please note that the units of the catches vary in each slide.

In the first of these, red and blue king crabs have been plotted together, but bear in mind that red king crabs constitute the majority of these landings [slide 2]. Note for example, that the Kodiak red king crab fishery built to peak landings in the mid-1960s, declined significantly in the late 1960s, and then more or less stabilized at much lower levels until the 1980s when the fishery crashed. The fishery has been closed since the 1983-1984 season due to extremely depressed stock abundance.

Partly in response to declining landings in the Kodiak fishery in the late 1960s, the domestic fishery for red king crabs in Bristol Bay developed. Landings from this fishery built steadily through the 1970s and peaked at 60,000 tonnes (130 million pounds) in 1980. Then, catches declined very rapidly, and this fishery was closed for one year in 1983 due to low abundance. In recent years this fishery has been conducted, but catches have been maintained at relatively low levels.

Most of the fisheries for other stocks of red and blue king crabs were maintained over approximately a 20 year period before they, too, crashed. Most of these fisheries remained closed due to very low stock abundance.

The declines of fisheries for red and blue king crabs, in part, stemmed the growth of markets and fisheries for Tanner crabs [slide 3]. In most areas of the state, landings built through the mid- to late 1970s. Fisheries for these Tanner crab stocks experienced declining landings from the late 1970s through the 1980s. Many of these fisheries produce low landings today, and some are closed due to depressed stocks. One major exception to this is the Tanner crab fishery in the Bering Sea, which peaked at 30,000 tonnes (66 million pounds) in the late 1970s, declined with the other Tanner crab stocks, but rebounded toward the end of the 1980s.

Dungeness crab fisheries offer much more contrast to patterns in landings for king and Tanner crabs [slide 4]. Note, for example, that fisheries for Dungeness crabs in Southeast Alaska, Yakutat, and Kodiak have experienced pronounced cycles in abundance over time. Generally speaking, these stocks have remained rather healthy for more than 3 decades. However, landings have always been rather low in all other areas of the state. In some areas (e.g., lower Cook Inlet and most of Prince William Sound), fisheries have been closed due to depressed stocks. So, we have a rather wide range in abundance and landing trends in fisheries for Dungeness crabs as compared to king and Tanner crabs.

There are two crab species that are now producing significant landings. The first of these is the golden king crab [slide 5]. Fisheries for golden king crabs developed with the demise of fisheries for other king crab species. Recall that all fisheries for red and blue king crabs crashed in the early 1980s: this marked the beginning of the golden king crab fisheries. Thus, fisheries on golden king crabs have a very short harvest history.

The species currently producing the greatest landings is the snow crab [slide 6]. In part, this fishery grew in response to the decline of fisheries for Tanner crab. The snow crab fishery reached 74,000 tonnes (162 million pounds) by 1990, and grew further to 150,000 tonnes (328 million pounds) in 1991. This is the single largest crab fishery in Alaska and in the world today.

CRAB MANAGEMENT

Alaskan crab management can be divided into four types of strategies [slide 7]. There are those fisheries that we manage by *exploitation rate*. For such fisheries, we survey stock abundance, and generate a guideline harvest level (catch "quota") based on an exploitation rate policy. Another strategy that we use is *fishery performance*. Typically, in this case we do not have an abundance survey, but often we have other information on stock status from the catch data such as size distributions or even catch per unit effort as a measure of relative abundance. These might be fisheries that we manage with guideline harvest ranges that are based on fishery performance.

The other two types are *2-S* or *3-S*, where the S's refer to size, sex, and season, respectively. A 3-S fishery harvests males only above a certain minimum legal size during specified fishing seasons. In the case of 2-S management, there is no biologically-based prohibitions on fishing seasons.

I would like to give a few examples of fisheries that fit into these categories [slide 8]. Note that most of the red and blue king crabs fisheries are managed by exploitation rate strategies. Many fisheries for Tanner and snow crabs are managed in this way, as well.

Some of the red king and Tanner crab fisheries and a few golden king crab fisheries are managed by fishery performance. A few king and Tanner crab fisheries and some Dungeness crab fisheries are managed by a 3-S strategy. Most Dungeness and golden king crab fisheries are conducted during the molting and mating periods. Thus, they are regulated by 2-S management.

I would like to point out that, while we have four basic strategies, there are three common threads or cornerstones to our management programs for crabs in Alaska. These are the size, sex and season regulations [slide 9]. Even in the case of exploitation rate management or fishery performance, size-sex-season are used. Certainly, there are a variety of other measures that we use (e.g., legal gear, observers, thresholds), and I do not want to downplay their importance.

There is a rather long history of usage for size, sex and season regulations [slide 10]. For example, in the Kodiak red king crab fishery, sex restrictions that prohibited female harvest were in place since the start of that fishery in 1938. Size limits were first instituted in 1949: that is, males only above some minimum size can be taken legally. Since the 1960s, managers began using fishing seasons. In particular, fishing was prohibited during the "biological sensitive periods" that include molting and mating.

I would also like to point out that most crab research studies, i.e., investigations into biology and life history, have been done since the 1960s. So, it is rather ironic that we happen to have a situation in which the cornerstones (size-sex-season) to our management programs have been established prior to the conduct of most of the relevant research. Certainly, research has had effects on regulatory changes over time, but the cornerstones to crab management have remained virtually unchanged since their inception.

PURPOSE

With those observations in mind, I ask the following question: "How would we design crab management today, if we had all the benefits of this 30 years of crab research, without the impediments of being entrenched in these management frameworks [slide 11]?" In other words, if we had started from scratch, what kind of management program would we have built?

The goal of my talk is first to try to bring together some of the key biology and life history features of these crab species. And secondly, based on this synthesis, I then suggest some new directions and perspectives on fishery management [slide 12].

CRAB CLASSIFICATION

There is no need to go into all of the details of crab classification here. But, it is worth noting that not all crabs are created alike. There are two, basic "types" of crabs [slide 13]. There are brachyurans which are the "true" crabs. These include Tanner, snow and Dungeness crabs and these are grouped with other species such as the blue crab of the east coast.

On the contrary, the king crabs are anomurans and are grouped with other species such as the hermit crab. I will show later that this is a lot more than just semantics, and that there are some very fundamentally different biological and life history features that go along with classification into these two groups. Further, these features have some profound implications on fishery management.

BIOGEOGRAPHY

One aspect worth considering is biogeography [slide 14]. It is a basic principle of biogeography that animals tend to be most abundant in portions of their range that have optimal habitats. This has an important implication on fisheries. It follows that fisheries that occur on stocks that reside near the geographic limits of a range of a species tend not to sustain high harvest levels.

As you might expect, there are a number of Alaskan crab stocks that live near the geographic limits of the range of the species [slide 15]. These include Norton Sound red king crabs at the northern limits of the range for this species. Blue king crabs reside at the southern end of their range in Southeast Alaska. Dungeness crabs in Prince William Sound, lower Cook Inlet, and along the Alaska Peninsula and Aleutian Islands occur at the extreme northern and western limits of the range for that species. I will point out implications of these distributions later in my report.

r AND K SELECTION

There is an area of biology that has some general implications to fishery management. To discuss these, I first need to define r and K selection [slide 16]. Ecologists tend to think of species residing along a spectrum. The two ends to this spectrum are occupied by r-selected species and K-selected species. The r species tend to be those that are very opportunistic. They don't live very long, they reach small sizes only, they reproduce once, and they grow very rapidly. Good examples of r-selected species are most terrestrial insects.

On the other hand, we tend to think of K-selected species as being more competitive. These species tend to live longer lives, they achieve large sizes, they reproduce multiple times and often have complex reproductive strategies, and they develop slowly. Good examples of K-selected species are most terrestrial mammals, including humans.

There are a number of attributes of r- and K-selected species that have relevance to fisheries [slide 17]. Age at which animals mature, for example, tends to be young for r-selected species. These species also tend to have low maximum ages, high annual mortality rates, and high egg production or "fecundity." On the contrary, K-selected species tend to have the opposite attributes.

I considered these four features with respect to red king, Tanner, and Dungeness crabs in Alaska [slide 18]. Age of maturity is rather similar (6-7 years of age) for red king and Tanner crabs, but Dungeness crabs tend to mature younger -- around age 3. Maximum age ranges from no more than 8 years for Dungeness crabs to more than 20 for the red king crab. Red king and Tanner crabs experience similar, moderate levels of annual mortality, which perhaps averages around 26% per year. There is a wide range in estimates of annual natural mortality rates for Dungeness crabs, but the average mortality rate of Dungeness crabs is greater than those of red king or Tanner crabs. Red king and Tanner crabs similarly produce up to half a million eggs, whereas Dungeness crabs produce up to 2.5 million eggs.

These attributes were considered in terms of r and K selection [slide 19]. I would place red king crab at the K end of the spectrum, Dungeness crab at the r end of the spectrum, and Tanner crabs somewhere in the middle. While I have not explicitly considered blue and golden king crabs nor snow crabs here, I would say the other king crab species would probably reside toward the K end of the spectrum with red king crabs, and snow crabs would fall somewhere in the middle with Tanner crabs.

It is important to realize that these r and K determinations are all very relative. Red king crabs are not nearly as K selected as, say, the Pacific Ocean perch that live to very old ages. Likewise, the Dungeness crab is not nearly as r selected as, say, the Atlantic blue crab that live to ages 2-4 only.

There are some general implications of r and K selection on fisheries [slide 20]. Generally, r-selected species tend to be very tolerant of very high fishing mortality, and yield per recruit (i.e., pounds per crab corrected for survival) tends to be maximized at a young age. Fisheries on these stocks tend to be productive, and stocks often recover quickly from overharvest.

The opposite it true for K-selected species. These tend to tolerate only low levels of fishing mortality, and yield per recruit tends to be maximized at older ages. Last, these stocks are much more vulnerable to overfishing and they recover slowly.

REPRODUCTION

Crab biologists consider three different measures of maturity for males [slide 21]. There is a *physiological maturity* which is the size at which they first begin to produce spermatophores. *Morphometric maturity* occurs at the size that a large chela (claw) is developed which may play an important role in reproduction. *Functional maturity* occurs at the size at which males first begin to participate in reproduction in the natural environment.

There are some reproductive benefits of large size [slide 22]. We know, for example, that functional maturity is always larger than physiological or morphometric maturity. We do not necessarily understand why this is, but the point is that it is the large males that tend to be most significant in reproduction. So, there is some advantage bestowed to large males, because they don't necessarily reproduce once they begin to produce sperm nor when they first develop a large claw.

In some species, females may require large males for reproduction. These large females may simply go unmated if there aren't large males available. Large males may mate with multiple females, whereas the small males may not be able to do so effectively. In addition, small males may have difficulty fertilizing a female's

full egg clutch.

How many opportunities do males have to mate? I already pointed out that functional maturity is larger than morphological maturity. Also, I want to point out that, in the past, it has been the Board's desire to set the legal size limit at 1-2 molts above size of maturity. One problem is that these have generally been based on morphological maturity. However, if we consider maturity to be functional maturity, then we find that, for red king crabs, legal size is nearly the same as size of maturity [slide 23]. So, a functionally mature red king crab off Kodiak does not have any opportunities to mate prior to becoming vulnerable to fishing. On the other hand, for Tanner and Dungeness crabs there is a "safe window" within which males become functionally mature and yet still have to molt once more before they become of legal size.

So, how many mating seasons are afforded to these crabs before they become harvestable size? There are none for red king crabs, because functionally mature crabs are already of legal size. But, additionally, red king crabs molt annually up to legal size. On the other hand, once Tanner and Dungeness crabs become mature, they tend to skip-molt or miss a year or more before molting again to legal size. So, males of these two species might have an extra year as mature, sublegal crabs before being recruited to the fishery, and they may have some added breeding chances compared to red king crabs.

There is another reproductive feature that is traceable to crab classification. This feature is sperm storage. We find that female brachyurans (e.g., Tanner and Dungeness crabs) possess abdominal receptacles that allow them to store sperm. Thus, males can inseminate them, and the females can save that sperm for use in subsequent egg extrusions to fertilize eggs up to two years later. On the other hand, with respect to anomurans (e.g., king crabs), males must be physically present when the female extrudes eggs in order for fertilization to take place. So, sperm storage capacity seems to be another advantage bestowed to the brachyurans compared to the anomurans.

GENETIC SELECTION

Another aspect deserving of attention is genetic selection [slide 24]. Recall that we have size limits for males, and in some cases we have rather high harvest rates on those large males. These two features are the ingredients for genetic selection to occur. When we use a size limit, we have the potential to selectively remove the fastest growing crabs from the population. When we have a high harvest rate, we increase the rate of selection. Obviously, crabs that grow faster (larger growth increments or higher molting probabilities) reach legal size sooner, and so they will be vulnerable to more years of fishing pressure.

It turns out that growth has a genetic component, so we can actually genetically select against fast growth and for slow growth. Additionally, growth tends to be linked to other features, such as fecundity and maturity. The main point is that fisheries with high harvest rates and size limits can actually select for population characteristics that lead to low productivity through time. That is, we can actually change the long-term productivity of our crab populations through genetic selection.

CAPTURE AND HANDLING EFFECTS

Capture and handling effects are important considerations in crab fisheries [slide 25]. I'm not going to go into this in any great detail, but the topic deserves serious attention. Again, recall that we have size limits and sex restrictions. Yet, our pot gear tends to capture crabs of various sizes of both sexes. These animals interact in the pots, and the pots get retrieved to the surface aboard the vessel. The females and sublegal males get sorted on deck and tossed overboard. This sequence of events can create a variety of lethal and sublethal effects that may influence the productivity of our fisheries. I term *catching mortality* as those deaths that occur within the pots prior to retrieval, *ghost fishing mortality* are deaths that occur in lost pots, and *handling mortality* are deaths that occur due to stress or injuries incurred during the sorting/discarding process. Sublethal effects include limb loss, reduced feeding rates, reduced growth, and loss of vision. So, it could well be that size and sex restrictions are causing some adverse effects on our crab stocks.

RECOMMENDATIONS

With that brief overview, I offer some recommendations. The first of these is that management should probably be most conservative for king crab fisheries and could be most liberal for fisheries on Dungeness crabs [slide 26]. To a large extent, this is based on our review of r and K selection. That is, king crabs, being most K selected, are probably least likely to tolerate high harvest rates. Whereas, Dungeness crabs, being most r selected, can probably better tolerate higher rates of exploitation. Recall the persistent cycles in Dungeness crab landings [slide 4]. Such cycles suggest some resilience of these stocks to overharvest.

Yet, management should probably be somewhat more conservative for Dungeness crab fisheries in Alaska than for Dungeness crab fisheries along the Pacific northwest coast. This is due to geographic variation in those key life history parameters. For example, Alaskan Dungeness crabs mature later, live longer, and probably have lower annual natural mortality rates than their counterparts to the south. So, they might tend to be somewhat more K-selected and more vulnerable to overfishing than stocks of

Dungeness crab residing along the Pacific northwest.

Management should be most conservative for fisheries on stocks of crabs that are at or near the geographic limits of the species' range. These include Norton Sound red king crabs (northern limits), blue king crabs in Southeast Alaska (southern limits), and Dungeness crabs in Prince William Sound, lower Cook Inlet, and along the Alaska Peninsula and Aleutian Islands (northern and western limits).

We should re-evaluate size limits [slide 27]. To do so, I argue that we need to consider size of functional maturity not morphological or physiological maturity. As I pointed out earlier, in the past it's been the Board's desire that legal size limit shall be 1-2 molts above size of maturity. But, because size of maturity has often been based on morphology, we have not necessarily provided a 1-2 molt buffer to those males that actually participate in reproduction.

Growth increment and molting probability are also important in considering size limits. How much does a crab grow each year, and does it grow every year? How much time does a crab spend as a mature crab before it molts to legal size? As we've seen with the Dungeness and Tanner crabs, species that begin to skip molt just prior to attaining legal size may have additional mating opportunities beyond those afforded to the king crabs.

Sperm storage appears to bestow reproductive advantages. This capability is one of the features that separates the brachyurans which have it and the anomurans which don't. We should consider the benefits of large body size, and the very real possibility that it is the largest males that are the most valuable to reproduction. Also, genetic selection needs to be considered when we re-evaluate size limits.

We should consider the merits of a female harvest. To do so, we should evaluate what effects our single-sex fisheries are having on sex ratio, and the implications of altered size distributions of spawning stocks. What happens to the largest mature females during fisheries for large males? Can they find mates?

Gear modifications should be made to reduce the catch of non-legal crabs so that we can minimize capture and handling effects [slide 28]. There are a number of options, and the Board will be hearing about some of these things a bit later in the meeting. As an alternative, we might even consider a very different management approach: abandon size and sex limits altogether, and institute a "keep what you catch" policy. I certainly would not advocate this for fisheries managed by 2-S or 3-S strategies. But, in cases where we have good abundance estimates, this may be a possibility worth considering. It may be a way to virtually eliminate capture/handling effects, and reduce genetic selection. If an

exploitation rate policy is maintained, we could actually increase the abundance of large males thus better preserving the natural size structure and sex ratio of the population. Certainly, such a change in management strategy would need to be very carefully weighed. Not only are there biological considerations, but economic factors (e.g., market effects) are very important.

Just as we have done for the king, Tanner and snow crabs, we should seriously consider seasonal closures for Dungeness crab fisheries during the molting and mating periods. This is a very sensitive period in the life history of Dungeness crabs when they are most vulnerable to handling mortality and cannibalism in pots.

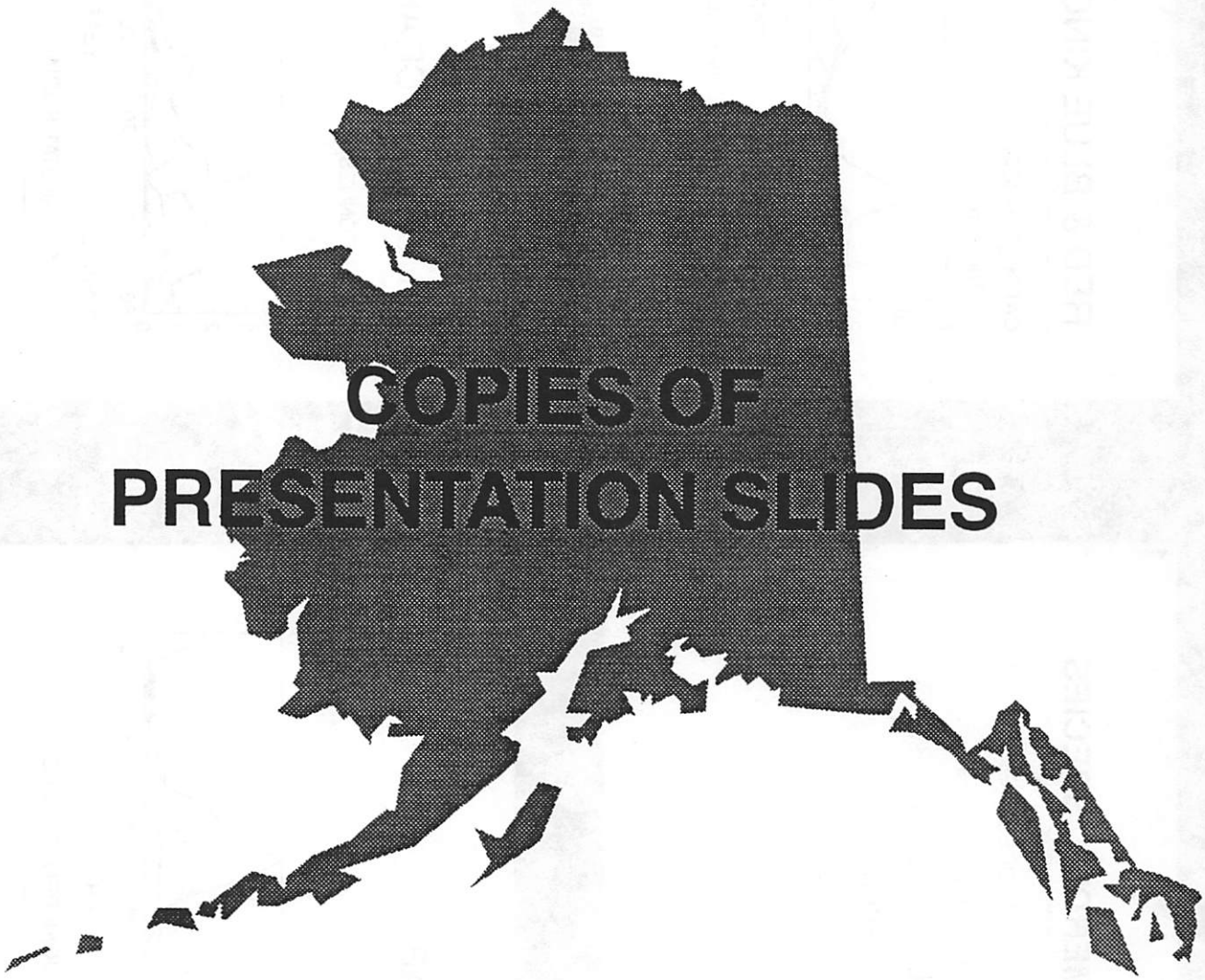
Lastly, as we begin to reconsider some of the bases for our management of crabs, research needs to play a very integral part in these changes. Handling effects and genetics should be further investigated. Also, there are some very important features that regulate stock productivity that we really don't know much about, including annual mortality and growth. It is rather distressing that the two species (snow crab and golden king crab) that currently sustain some of our most significant fisheries are the same species that we know the very least about. Can we avert crashes of these stocks?

At present, we're working on some of these areas of crab research. So, we hope to be able to come forward with some concrete proposals for management changes in the not-so-distant future. We want to seriously consider fishery management alternatives, because of the long history of crab fishery collapses with past strategies and because we want to promote the healthiest fisheries possible for many years to come.

LITERATURE CITED

Kruse, G.H. 1992. Biological perspectives on crab management in Alaska. Alaska Department of Fish and Game, Division of Commercial Fisheries, Professional Paper 071, Juneau.

BIOLOGICAL PERSPECTIVES ON CRAB MANAGEMENT IN ALASKA



COPIES OF PRESENTATION SLIDES

Gordon H. Kruse
Alaska Department of Fish and Game
Juneau, Alaska U.S.A.

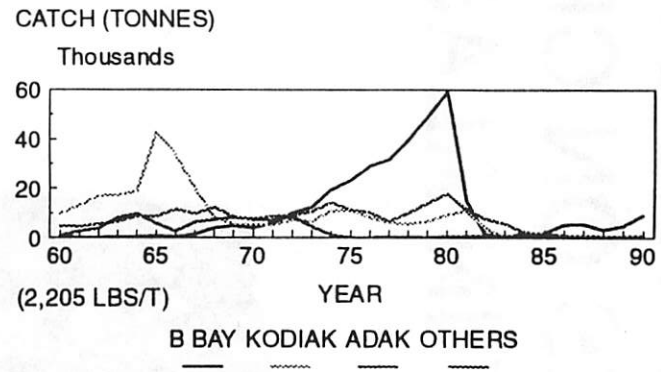
1

MAJOR COMMERCIAL SPECIES

Red King Crab (PARALITHODES CAMTSCHATICUS)
Blue King Crab (PARALITHODES PLATYPUS)
Golden King Crab (LITHODES AEQUISPINUS)
Tanner Crab (CHIONOECETES BAIRDI)
Snow Crab (CHIONOECETES OPILIO)
Dungeness Crab (CANCER MAGISTER)

2

RED & BLUE KING CRABS



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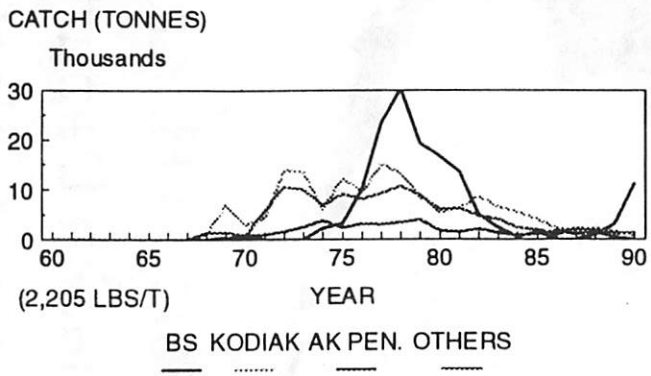
TANNER CRAB



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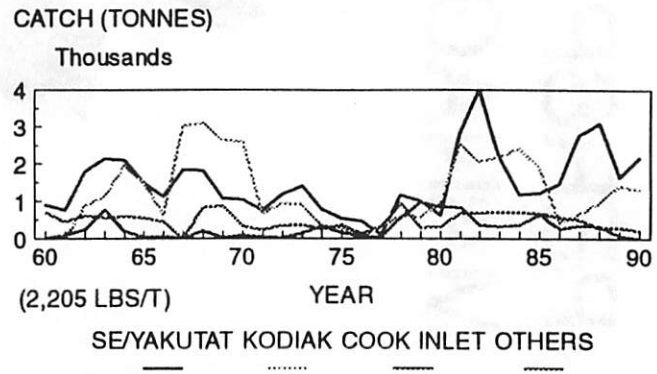
DUNGENESS CRAB



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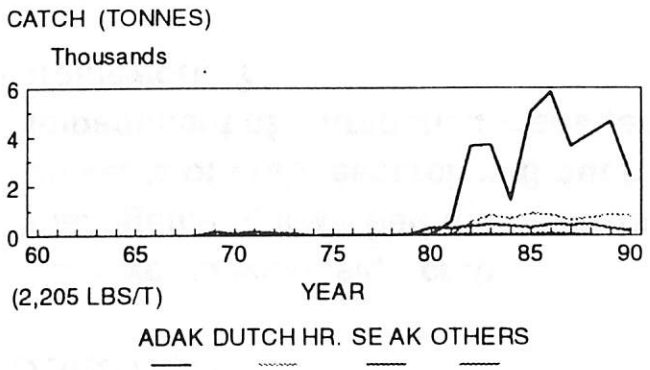
GOLDEN KING CRAB



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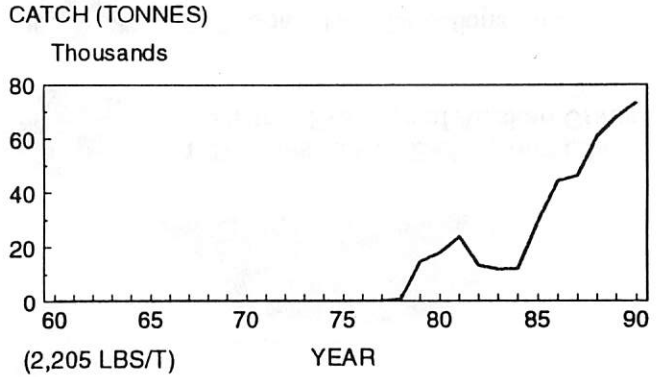
SNOW CRAB



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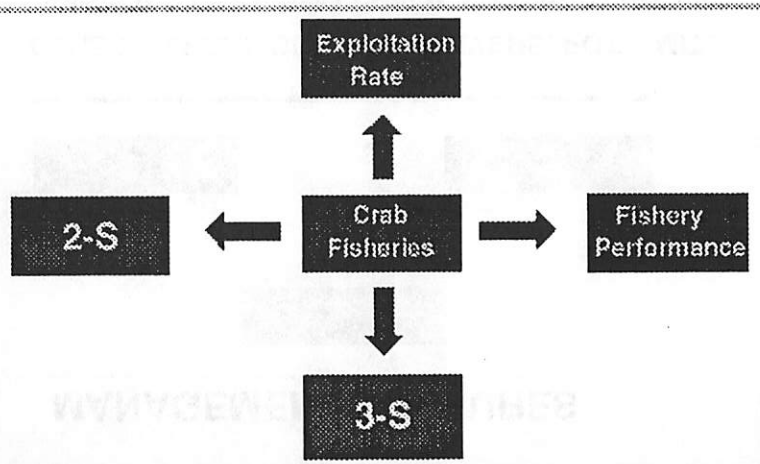
CRAB MANAGEMENT STRATEGIES



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CRAB MANAGEMENT STRATEGIES

EXPLOIT. RATE:

Many Red King Crabs
Many Blue King Crabs
Many Tanner Crabs
All Snow Crabs

3-S:

Few Red King Crabs
Few Tanner Crabs
Some Dungeness Crabs

FISH. PERFORM.:

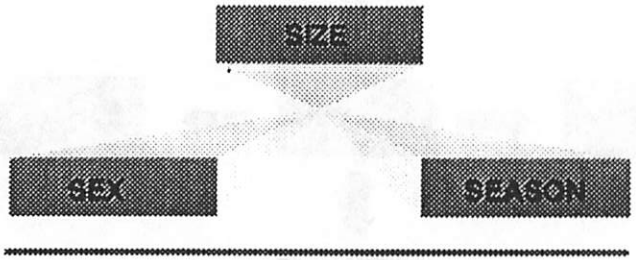
Some Red King Crabs
Some Tanner Crabs
Few Golden King Crabs

2-S:

Most Dungeness Crabs
Most Golden King Crabs

9

MANAGEMENT MEASURES



OTHERS: LEGAL GEAR, OBSERVERS, POT LIMITS, GUIDELINE HARVEST LEVELS, THRESHOLDS, ETC.

10

MANAGEMENT PRECEDENCE

Kodiak Red King Crab Fishery:

- 1938 - Sex Restrictions
- 1949 - Size Limits
- 1960s - Fishing Seasons

11

QUESTION:

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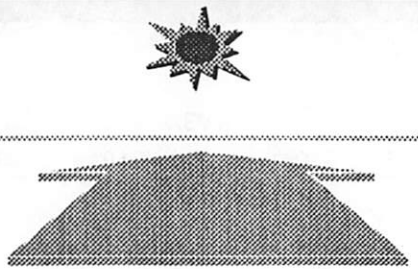
How would we design crab management, if we had the benefits of 30 years of crab research without the impediment of entrenched management frameworks?

12

GOAL



1. Synthesize Key Biology and Life History Features of Alaskan Crabs

2. Suggest New Directions and Perspectives on Fishery Management

13

CRAB CLASSIFICATION

BRACHYURANS:	ANOMURANS:
Tanner Crab	Red King Crab
Snow Crab	Blue King Crab
Dungeness Crab	Golden King Crab
Blue Crab	Hermit Crab

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BIOGEOGRAPHY

PRINCIPLE:

Animals are most abundant in portions of their range with optimal habitats.

RELEVANCE TO FISHERIES:

Fisheries on stocks near the geographic limits of a species tend not to sustain high harvests.

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SELECTED RANGE LIMITS

RED KING CRAB:

Norton Sound

BLUE KING CRAB:

Southeast Alaska

DUNGENESS CRAB:

Prince William Sound, lower Cook Inlet, Alaska Peninsula, Aleutian Islands

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r AND K SELECTION

- r SELECTED SPECIES -
  - OPPORTUNISTIC LIFESTYLES (SHORT LIVES, SMALL SIZE, ONE-TIME REPRODUCTION, RAPID DEVELOPMENT
  - E.G., INSECTS
- K SELECTED SPECIES -
  - COMPETITIVE LIFESTYLES (LONGER LIVES, LARGE SIZE, MULTIPLE REPRODUCTIONS, SLOWER DEVELOPMENT)
  - E.G., MAMMALS

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ATTRIBUTES OF r AND K SPECIES

	r	K
AGE OF MATURITY	Low	Hi
MAXIMUM AGE	Low	Hi
ANNUAL MORTALITY	Hi	Low
EGG PRODUCTION	Hi	Low

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BIOLOGY & LIFE HISTORY TRAITS

	RKC	TC	DC
AGE OF MATURITY	Old (7)	Old (6-7)	Med (3)
MAXIMUM AGE	V Old (>20)	Old (12-15)	Med (8)
ANNUAL MORTALITY	Med (26%)	Med (26%)	Hi (18-92%)
EGG PROD. (MILLIONS)	Med (0.004-0.5)	Med (0.005-0.4)	Hi (0.7-2.5)

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SPECTRUM OF r & K SELECTION

K ——— r

Red King Crab — **Tanner Crab** — **Dungeness Crab**

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r & K IMPLICATIONS

r Selected:	K Selected:
Tolerate high F	Tolerate low F
Max. Y/R @ young age	Max. Y/R @ old age
Productive fisheries	Vulnerable to overfishing
Rapid stock recovery	Slow stock recovery

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WHAT IS MATURITY?

- PHYSIOLOGICAL MATURITY -
  - SPERM PRODUCTION
- MORPHOMETRIC MATURITY -
  - LARGE CHELA (CLAW)
- FUNCTIONAL MATURITY -
  - MATING PARTICIPATION

22

REPRODUCTIVE BENEFITS OF LARGE SIZE

- Size of functional maturity larger than sizes of physiological or morphometric maturity.
- Large females may require large males.
- Large males may mate with multiple females.

23

MATING CHANCES BETWEEN MATURITY & RECRUITMENT

	RKC	TC	DC
Molts to Legal	0	1	1
Mating Seasons	0	2	2
Sperm Storage	NO	YES	YES

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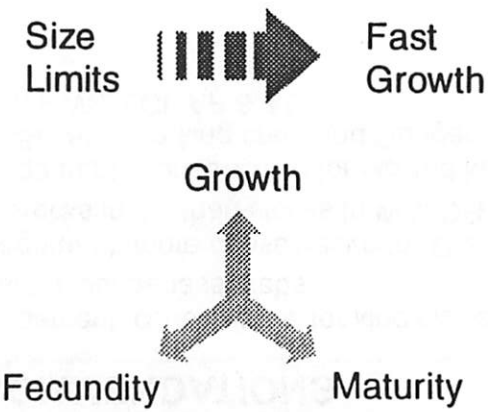
GENETIC SELECTION



25

CAPTURE & HANDLING EFFECTS

LETHAL:	SUBLETHAL:
Catching Mortality	Leg Loss
Ghost Fishing	Reduced Feeding
Handling Mortality	Reduced Growth
	Loss of Visual Acuity

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RECOMMENDATIONS

- Management: conservative for king crabs and liberal for Dungeness crabs.
- Management: more conservative for Dungeness crab stocks in AK than stocks in WA, OR & CA.
- Management: conservative for NS red king crab, SE AK blue king crab, and Dungeness crab in PWS, LCI, AP & AI.

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RECOMMENDATIONS

- Size limits should be re-evaluated for:
  - Size of functional maturity
  - Growth increment & molt frequency
  - Sperm storage capability
  - Benefits of large body size
  - Genetic selection
- Consider female harvest
  - Sex ratio
  - Size of mating pairs

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RECOMMENDATIONS

- Gear modifications to minimize catch of non-legal crabs or drop size/sex limits and institute "keep what you catch" policy.
- Create seasonal closures for Dungeness crab fisheries during molting and mating.
- Research on important unknowns: M, growth, handling effects, genetics, etc.

AGENDA D-1(b)
JUNE 1993

REVIEW OF THE ALASKA BOARD OF FISHERIES DECISIONS BERING SEA/ALEUTIAN ISLANDS CRAB MANAGEMENT BY ALASKA DEPARTMENT OF FISH AND GAME FOR THE NORTH PACIFIC FISHERIES MANAGEMENT COUNCIL

APRIL 21, 1993

The Alaska Board of Fisheries meet in Anchorage from February 2 - 10 to take public testimony, hear staff reports and review proposed regulatory changes to the Bering Sea and Aleutian Islands king and Tanner crab fisheries. Proposed changes included: fishing seasons, gear modification, registration areas, district registration pot limits, and changes to the Crab Observer Manual.

During their deliberations, the board adopted a comprehensive management plan entailing the complexities and interactions of multi-species management in the Bering Sea/Aleutian Islands. A great deal of time was spent by the board considering bycatch issues and their effects on the stocks in the Bristol Bay king and Tanner crab fisheries. Observer information from the 1992 Bristol Bay red king crab fishery shows an average catch per pot of 5.2 legal, 11.2 sublegal, and 11.7 female, red king crab and 4.2 legal

C. bairdi Tanner crab. The bycatch of female and sublegal red king crab and bairdi Tanner crab in the Bristol Bay king crab fishery was addressed in several ways: 1) Opening the Bristol Bay red king crab season and the Bering Sea bairdi Tanner crab season simultaneously. 2) Allowing the retention of both species during the red king crab fishery. 3) Closing the area east of 163° to a further take of bairdi Tanner crab after the red king crab season, and 4) Changing the escape panel mesh requirement in the fishery from 7 3/4 inches to 9 (nine) inches.

For the Bering Sea Tanner crab fishery, bycatch of king crab and female and sublegal Tanner crab, was address by: 1) Moving the fishery west of 163°, off the major king crab grounds, and 2) Requiring a minimum of a three (3) inch tunnel eye height in the pots.

The board also addressed the problems that managers are encountering with the large effort levels experienced in all the Bering Sea fisheries by: 1) Re-establishing pots limits for the Bristol Bay and Bering Sea king and Tanner crab fisheries, and 2) Establishing a super-exclusive registration area for the Norton Sound red king crab fishery. Unlike the pot limits adopted by the

board in 1992, where all vessels participating in a fishery were allowed to fish up to the legal limit, the new regulation allows larger vessels, those over 125 foot in overall length, to fish a greater number of pots. For fisheries that have small preseason harvest guidelines, such as the Pribilof Island blue king crab fishery which has not been opened for the past two seasons due to the large anticipated fishing effort, the pot limit was reduced considerably, as was the pot limits for the Saint Matthew and Norton Sound king crab fisheries.

In established the Norton Sound section as a super-exclusive registration area, vessels that fish for king crab in this area, may not fish for king crab in any other king crab registration area during the registration year, (June 28-June 27). The board heard testimony from area residents that they were prepared to fish and had attempted to fish during the summer fishery, but due to the large vessel effort the season had lasted only a few days making this short of a fishery impossible for locals to compete. Under the new designation, both resident and nonresident fishermen would still be able to participate in the summer fishery, but participants will not be able to fish king crab in other areas.

To assist managers with fisheries that have experienced derby type seasons, like the Saint Matthew blue king crab fishery, the board voted, not only to reduce the pot limit, but to hold the fishery concurrent to the Pribilof district blue king crab season. By conducting both seasons simultaneously, fishing effort would be distributed between the two areas. With the preregistration requirements for the issuance of buoy stickers, the managers will be able to determine effort levels prior to the opening of the areas, thus providing an orderly fishery.

The board heard from the staff that pot limits were not presently needed to manage the golden king crab fisheries in the Dutch Harbor and Adak areas. Most vessels are not presently equipped to fish golden king crab, therefore, effort levels are low. Fishing effort in the Dutch Harbor golden king crab fishery declines when more productive and higher value fisheries in other areas open. The Adak golden king crab fishery has lasted in excess of 288 days for the past seven (7) years, and has experienced a decline in vessel effort as the price and demand for golden king crab has decreased. The board did adopt new regulations allowing golden king crab in the Adak area to be taken only in longline gear for the following reasons: 1) Due the nature of the fishery occurring in deep waters in excess of 100 fathoms and in the passes of the Aleutian Islands

that experience enormous tides and currents, pots attached to ground lines are the only practical means of harvesting the brown king crab resource. 2) The brown king crab fishery in the Bering Sea/Aleutian Islands has evolved from a single pot fishery to the longline fishery of today, and 3) The retrieval of lost longline pots has been perfected by the fleet, vastly reducing the gear loss experienced in this fishery.

The board also adopted regulations requiring Tanner crab vessels to register for each district of Area J, (Westward), allowing the department to track fishing effort in each.

The board reaffirmed the biodegradable twine requirement at 30 thread, 100% cotton twine, but will allow the introduction of galvanic timed release devices. Galvanic releases must corrode within 30 days to meet the biodegradable regulation currently in affect.

During their deliberations, the board discussed, in length, the feasibility of conducting debriefings of crab shellfish observers in Anchorage and other locations. The staff informed the board that neither the funds nor the staff were available at this time to initiate this program without reallocating both from existing or other programs. After listening to management and observer staff comments concerning the problems that would be encountered with remote debriefing sites, (other than Dutch Harbor), and the staffing and budget problems of the department, the board determined that the implementation of other debriefing sites was not practical at this time, but should be considered by the department when the budget allowed.

Other changes to the Crab Observer Manual were primarily house keeping modifications meant to clarify problems encountered since the board last looked at the program. Most new regulations pertaining to the program centered around the observers qualifications, conflict of interest standards, certification, and performance standards.

During public testimony, the board acknowledged the formation of the Observer Oversight Committee established in the draft North Pacific Fisheries Research Plan. Since this committee would provide advice on the general provisions of the observer program and fee portions of the Research Plan to the Council, Board, the Commissioner of ADF&G, and the Regional Director of NMFS, the board agreed that this committee would be an asset to the existing state program.

Pot limits for Kodiak Tanner Crab first went into effect in the 1991 Tanner season. Prior to 1991 the department frequently had to announce closures of fisheries prior to having any landings or fishery performance information. For the past three years with a 75 pot limit in effect the fishery was managed inseason.
An example of this is in the eastside section fishery. In 1990 a total of 64 vessels landed 1 million pound in a 4 day fishery. There were a total of 8500 pots on the grounds. In 1991 there were approximately 3700 pots on the grounds fished by 49 vessels. The harvest was 800,000 pounds landed in 14 days of fishing.

The following year in 1992 the eastside was fished by 79 vessels with a total of 5100 pots. In this 10 day fishery the harvest was 2 million pounds.

Overall the condition of the stocks around Kodiak Island have continued to decline. If a pot limit were not in place it is very likely that a season would not have occurred for the past three years.

Pot limits in Kodiak have enabled the department to evaluate fishery performance inseason and manage a fishery based on fishery performance.

Total pots fished in Kodiak:

1989	17,100
1990	26,229
1991	9,560
1992	10,300
1993	10,000

Table 4. Catch per unit effort (CPUE) of commercially important species during the 1992 Bristol Bay red king crab fishery including total sample catch and estimated total catches in the fishery.

Species	Total pot[a] sample catch	Catch per unit effort	Estimated total[b] fishery catch
Red king			
legal male	1,520	5.2	1,070,472
sub-legal male	3,235	11.2	2,305,632
female	3,203	11.7	2,408,562
C. Bairdi			
legal male	1,213	4.2	864,614
sub-legal male	832	2.9	596,994
female	107	.4	82,344
C. Opilio			
legal male	18	.1	20,586
sub-legal male	0	-	-
female	0	-	-
Pacific cod[c]	121	.4	82,344
Yellowfin sole	216	.7	144,102
Halibut	7	.1<	4,986

[a]Total pot contents derived from 289 random samples taken on catcher-processors during the fishery.

[b]Estimated catch derived from pot sample CPUE x 205,860 total reported pot pulls during the fishery.

[c]All fish species mixed size and sex.

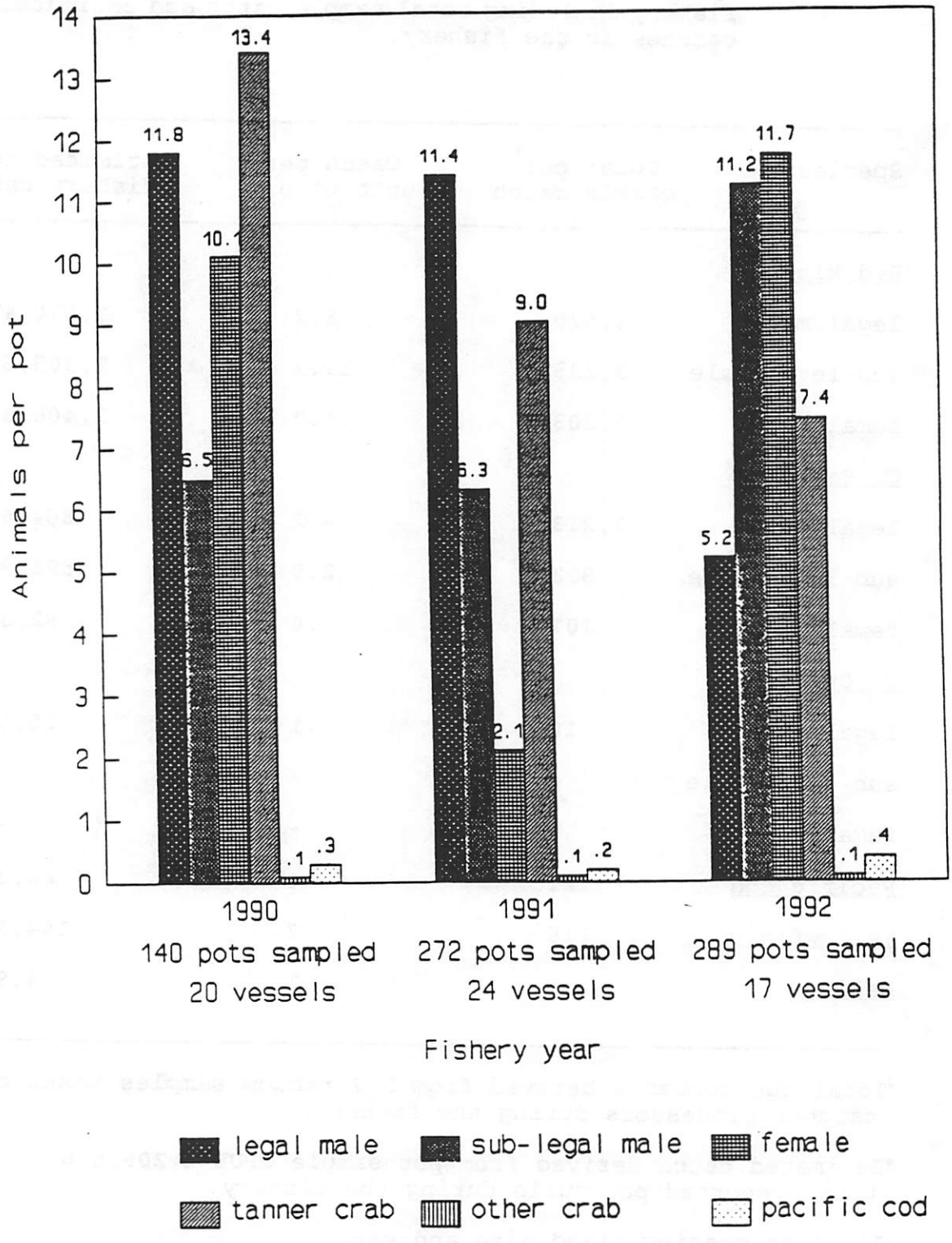


Figure 2 **Bristol Bay red king crab fishery catch per unit effort in 1990, 1991 and 1992.**

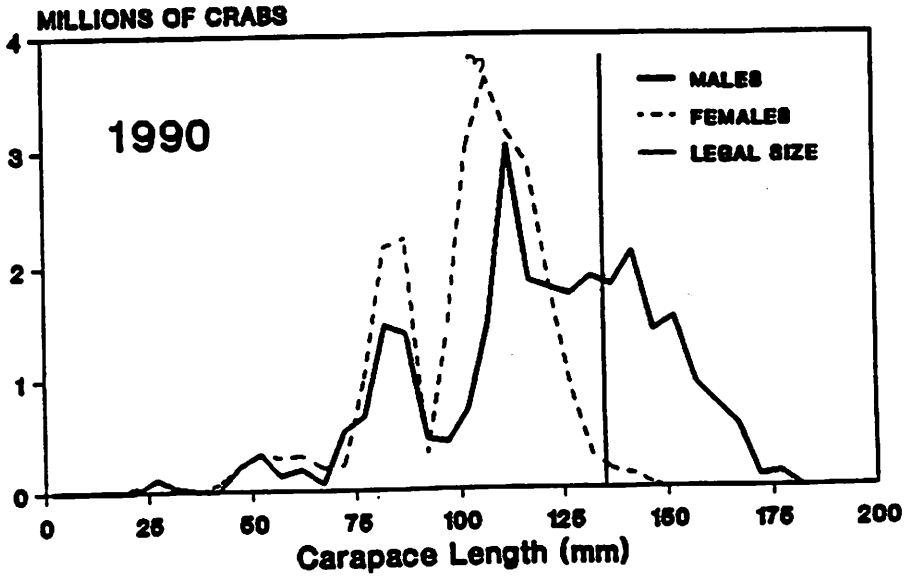
BERING SEA KING AND TANNER CRAB POT LIMITS

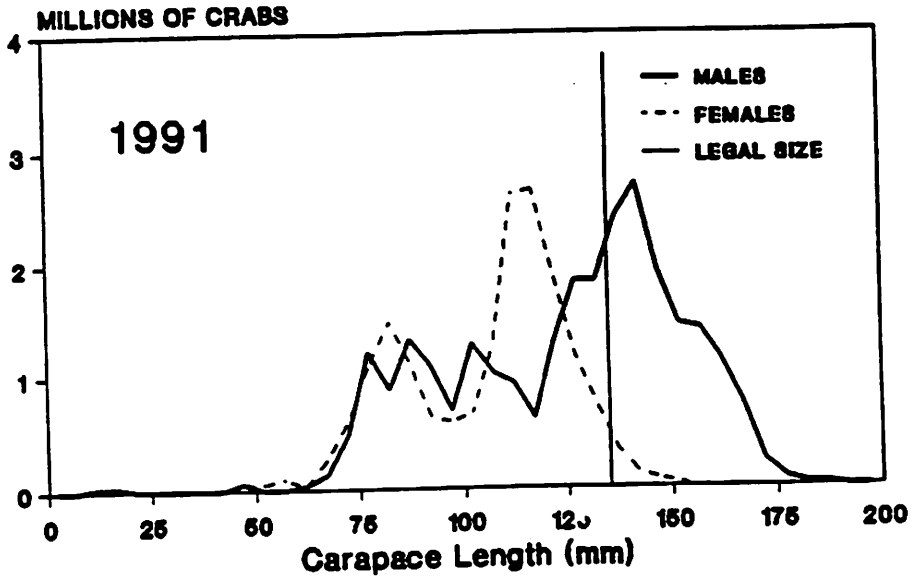
BY

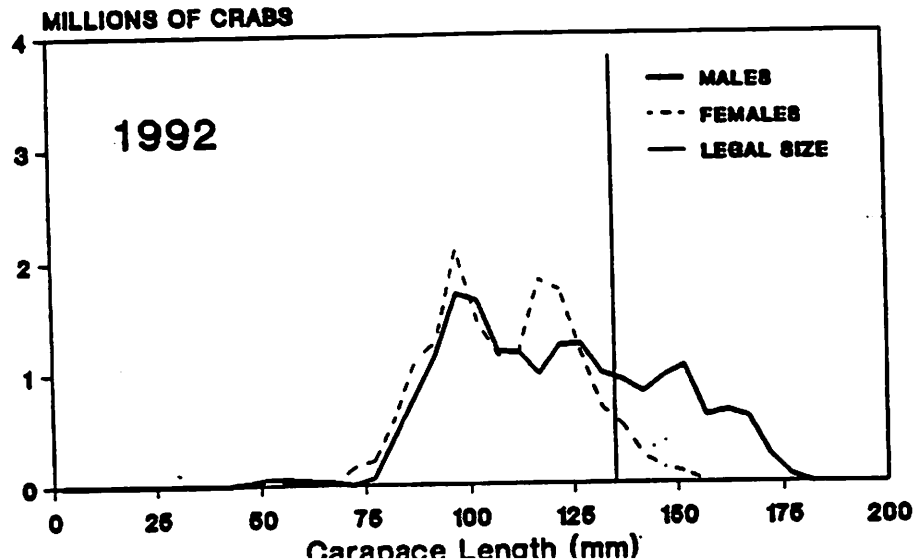
REGISTRATION AREA

AREA	VESSEL SIZE	POT LIMIT
Bristol Bay	< 125 ft	200
	> 125 ft	250
Bering Sea Tanner crab	< 125 ft	200
	> 125 ft	250
Saint Matthew	< 125 ft	60
	> 125 ft	75
Pribilof	< 125 ft	40
	> 125 ft	50
Norton Sound	< 125 ft	40
	> 125 ft	50
Saint Lawrence	< 125 ft	40
	> 125 ft	50

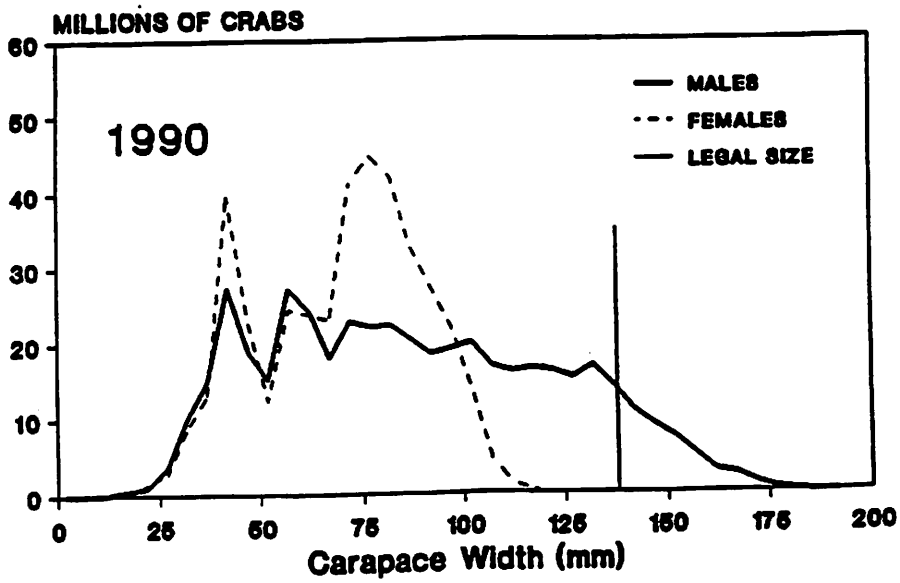
Red King Crab Length Frequency

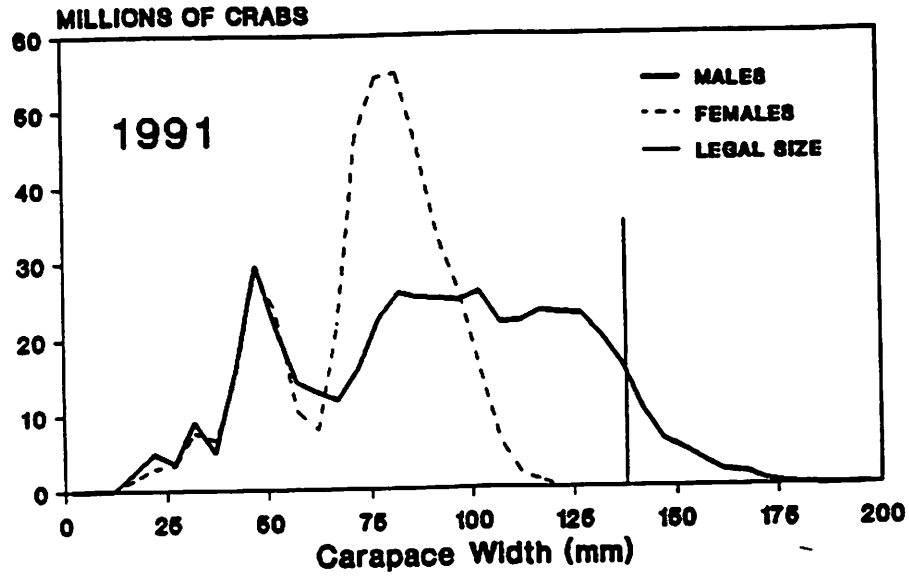


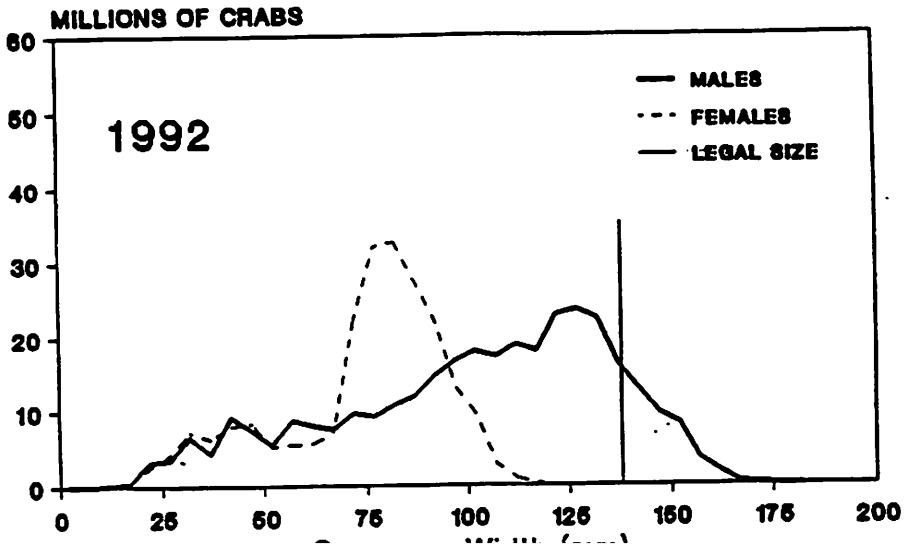




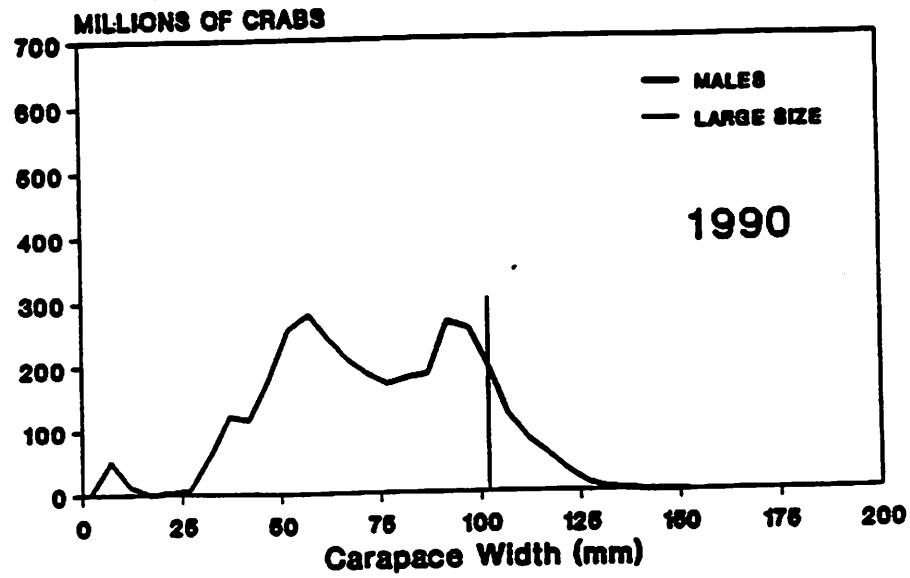
C. bairdi Width Frequency

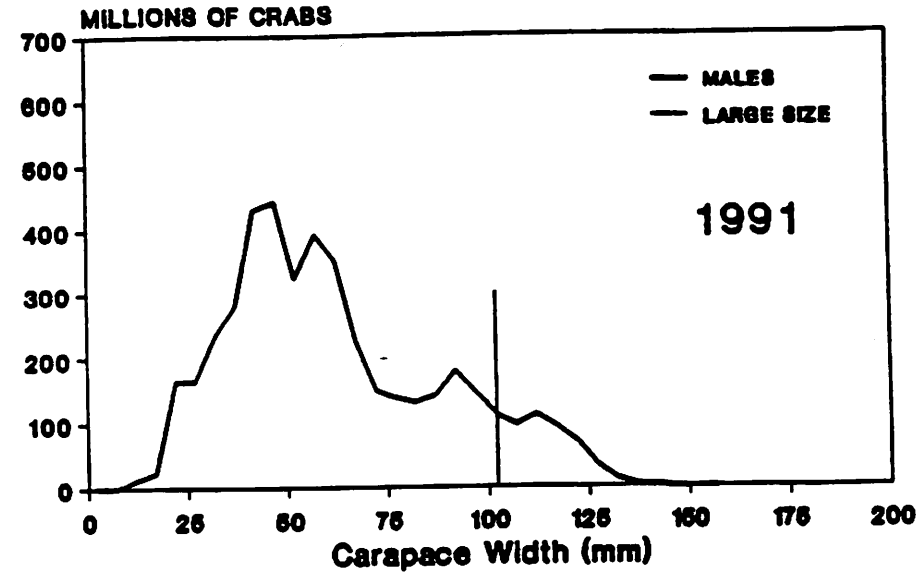


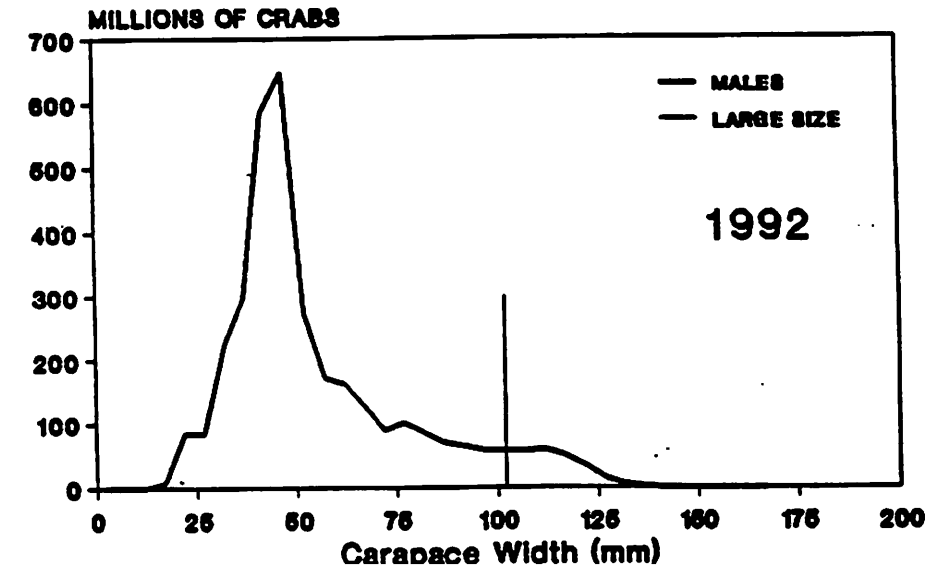




C. opilio Width Frequency







GOVERNOR

DEPARTMENT OF FISH AND GAME

BOARD OF FISHERIES

P.O. BOX 25526
JUNEAU ALASKA 99802-5526
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May 20, 1993

The Honorable Ronald H. Brown
Secretary
Department of Commerce
Washington, D.C. 20230

Dear Mr. Secretary:

The Alaska Board of Fisheries ("Board") manages the Bering Sea/Aleutian Islands (BS/AI) crab fisheries under delegated authority of the Fishery Management Plan for the King and Tanner Crab Fisheries in the Bering/Aleutian Islands ("FMP"). The Alaska Crab Coalition has appealed the Board's recent decision to adopt regulations establishing a superexclusive area for Norton Sound king crab fishery, claiming inconsistency with the Crab FMP.

The FMP requires the Board to provide written explanations of the reasons for its decisions concerning management of crab fisheries. The Board submits the following explanation of its decision concerning the Norton Sound crab fishery.

The Board met February 2-10, 1993, in Anchorage to consider comprehensive management of king and tanner crab fisheries, including those in the BS/AI. The meeting was publicly noticed, consistent with the Alaska Administrative Procedures Act, and was well attended by members of the industry and other concerned members of the public. In addition, representatives from the National Marine Fisheries Service (NMFS), the North Pacific Fisheries Management Council (NPFMC), State of Alaska Office of the Attorney General (AAG), NOAA General Council and the Alaska Department of Fish and Game (ADF&G) were present.

To appreciate the breadth of issues covered at this meeting, we submit a list of the following reports and presentations which the Board considered prior to their deliberations:

1. Biological Perspectives in Crab Management in Alaska. By Dr. Gordon Kruse, ADF&G

2. Summary of the Fisheries Management Plan (FMP) for Crab.

By Dr. Ray Baglin, NMFS[1]

3. Summary of the Invalidation of Crab Pot Limits by the Secretary of Commerce. By Jonathan Pollard, NOAA General Council[1], and Earl Krygier, ADF&G

4. Review of Pot Limit Alternatives. By Earl Krygier and Peggy Murphy, ADF&G

5. Report to Industry on the Eastern Bering Sea Crab Survey. By Dr. Robert Otto, NMFS[1]

6. History of the Regulation for an Escape Mechanism in Shellfish and Bottom Pots. By Al Kimker, ADF&G

7. Tests of Galvanic Release for Escape Devices in Crab Pots. By Dr. A. J. Paul, Univ. of Alaska, Institute of Marine Sciences.

8. Starvation Resistance in Alaskan Crabs. By Dr. A. J. Paul, Univ. of Alaska, Institute of Marine Sciences

9. Biodegradable Escape Mechanisms for Pot Gear: A Summary. By Dr. Gordon Kruse and Al Kimker, ADF&G

10. Bitter Crab Syndrome in Alaskan Tanner Crab: Importance and Management Considerations. By Dr. Ted Meyers, ADF&G

11. Staff Report on Aquatic Farming (FRED). By Jim Cochran, ADF&G

12. Review of King and Tanner Crab Fisheries in the Southeastern Alaska and Yakutat Areas. By Tim Koeneman, ADF&G

13. Review of King and Tanner Crab Fisheries in the Prince William Sound Area. By Charlie Trowbridge, ADF&G

14. Review of King and Tanner Crab Fisheries in the Cook Inlet Area. By Al Kimker, ADF&G

15. Review of Westward King and Tanner Crab Fisheries:

a. Kodiak, Chignik and South Peninsula. By Al Spalinger and Dave Jackson, ADF&G

b. Aleutians. By Mike Ward, ADF&G

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[1] The presentations by NOAA General Council, NMFS and the presence of NPFMC staff, satisfy the requirements of section 9.2 of the FMP.

c. Bering Sea. By Ken Griffin, ADF&G

d. Norton Sound. By Charlie Lean, ADF&G

16. Summary of the Crab Pot Buoy Sticker Program. By Ken Griffin, ADF&G

17. Mandatory Observer Program Overview. By Rance Morrison, ADF&G

18. Observer Program Data Analysis and Reporting. By Donn Tracy, ADF&G

19. Westward Region Research Report Programs:

a. PIT Tag Project (video/slide presentation). By Leslie Watson, ADF&G

b. Collector Project (video/slide presentation). By Forest Blau and Bill Donaldson, ADF&G

21. ADF&G Kodiak and South Peninsula Trawl Survey Overview (video/slide presentation). By Dave Jackson, ADF&G

22. Potential Economic Impacts of Alternative Pot Limits to the Economic Performance of Bristol Bay Red King Crab and Bering Sea C. opilio fishermen. By Dr. Joshua A. Greenberg, Univ. of Alaska, Fairbanks

23.Overview of the FMP criteria and Magnuson Act standards. (Bonnie Harris, Alaska Office of the Attorney General).

The issue of a superexclusive red king crab ("RKC") registration area in the Norton Sound section (Bering Sea Area Q3) first came before the Board as an agenda change request from the Norton Sound Economic Development Corporation during the March 1992 BS/AI crab meeting in Anchorage. Upon accepting the matter as an agenda change, the Board informed the industry and public present at that meeting that the issue of the Norton Sound superexclusive registration area would come before the Board at its February 2, 1993 statewide king and Tanner crab meeting in Anchorage. The Board also published proper public notice for the issue at the February 1993 meeting under the Alaska Administrative Procedures Act.

At the February 1993 meeting, the Board heard public testimony from numerous individuals, including crab industry representatives and organizations, advisory committee representatives from the Pacific Northwest, Dutch Harbor, Sand Point, Kodiak and Norton Sound regarding crab management; most of the advisory committees and a few individuals made comments on exclusive registration areas in

the Bering Sea. The Board heard presentations from the management staff and the Attorney General's office regarding this issue. Guidance from the Attorney General's Office, in consultation with NOAA General Council, indicated that the superexclusive designation would be permissible under the FMP; it being a subset of "exclusive registration" discussed in section 8.2.8 of the FMP. After deliberating the subject, the Board designated the Norton Sound Area, Q3, as a superexclusive registration area for RKC.

This action was taken in concert with other BS/AI crab management measures by the Board to address conservation, management and allocation concerns of BS/AI crab resources in the face of depressed stocks, increased fleet participation, capitalization and efficiency. See FB No. 93-___[2].

Under the status quo, the goals and objectives of the FMP and the national standards of the Magnuson Act (FMP ch. 7 and Appendix B), were not being met in Norton Sound; thus Board action was necessary. In particular, the status quo fishery was preventing economic stability to coastal communities and to segments of the industry wishing to concentrate their dependence on the Norton Sound summer RKC fishery; and conservation, full utilization and proper management of the resource was not occurring.

The actions taken by the Board to redress these concerns with regard to the Norton Sound section were to: (a) establish a 50/40 pot limit depending on vessel size, (b) establish a superexclusive registration area (whereby vessels may choose to fish in the superexclusive area in any given season, or outside of the superexclusive area, but may not fish both within and outside of the area in a season), and (c) extend the summer season date from July 1 to September 3 (it had previously been from August 1 to September 3).

The management goal of the FMP is to maximize the overall long-term benefit to the nation of the crab stocks, consistent with proper stewardship of the resource. Within the scope of this goal are seven objectives which relate to biological conservation, economic and social issues, gear conflicts, habitat preservation, vessel safety, due process and research and management. The establishment of the superexclusive registration area for Norton Sound is anticipated to better achieve these objectives than the existing regulations; under which some objectives were not being met. In support of its regulatory action, the Board makes the following findings for the Norton Sound RKC fishery consistent with chapter 7 of the FMP:

7.2.1 - Biological Conservation: Because of the small guideline

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[2] This citation (not yet designated) is the Boards' 1993 findings for pot limits.

harvest level and derby style fishery lasting only 48 hours, over and under harvest has commonly occurred. A superexclusive registration area is expected to produce a more orderly fishery with improved management precision which will provide management capability to maintain Norton Sound stocks for the long-term sustained yield of harvestable surpluses (ie., full utilization), while minimizing risk of overharvest. ADF&G would still be able to estimate and manage for deadloss as they do currently; and the Board anticipates that by slowing down the rate of harvest, deadloss, which occurs in a fast paced fishery, will decrease.

Additionally, the new regime will assist ADF&G in ensuring the continued 10 percent exploitation rate to protect stocks available for subsistence use, and the area closed to protect subsistence fishing will now be managed in the manner anticipated by the Board when 5 AAC 34.935 was put into place in 1983.

7.2.2 - Economic and social: The Board anticipates that its action will maximize social and economic benefits to the nation over time as specified in the FMP. Under the old regulation, the fishery had progressed to a point that in 1992, it provided no economic benefit. [As noted in the Board report, 27 vessels landed 74,029 lbs of crab at an average price of $1.75/lb. This would yield less than $5,000 per vessel, an amount which would not even cover expenses (ie., no net economic benefit).]

On the other hand, the new regulation should provide beneficial economic impacts to the coastal communities of the Norton Sound section including, Nome, Brevig, Diomede, Elim, Gambell, Golovin, Koyuk, Mission, St. Michael, Savoonga, Shaktoolik, Stebbins, Teller, Wales, White Mountain, Unalakleet, and others. The social and economic plight of these communities has been testified to the Board over the last year and a half in its meetings on subsistence, crab, salmon and herring. As documented in Part III of the Bering Strait Regional Community Development Plan (BSRCDP) provided to the Board, these communities have severely depressed economies. Though the median household income in these communities is about $16,000, roughly 35 percent of the people in these communities are below the poverty line and unemployment region wide is 75 percent. Commercial fishing provides one of the limited alternatives for cash income. Based on the economic information presented by Dr. Greenberg, the Board concludes that the range of household incomes in Norton Sound is in distinct contrast to the average household income supported by participants of the highly mobile and profitable Bering Sea crab fleet. The Board finds that while the anticipated social benefits to the coastal communities from creation of superexclusive registration area is difficult to explicitly quantify, real benefits do exist. Creation of a stable, long-term fishing opportunity will provide for maintenance of local culture and family ties, teach younger individuals within the communities the value of preserving the long-term health of the resource, and increase understanding and support of management

provided by state and federal entities. Additionally, a stable fishing economy in an economically distressed area can provide benefits of decreased welfare dependency, decreased alcoholism, and decreased abuse and suicide symptomatic of societies denied productive employment.

The historic subsistence economy of the coastal communities is gradually shifting to a subsistence/cash economy. Development opportunities which maintain consistency with cultural ties provide the best opportunity. To the extent which information is available, the Board finds it likely that because the fishery can occur over a longer period of time under the superexclusive area scheme, it will have access to fresh markets. Such access should command a greater price per pound and increase the overall value of the harvest to the State and the nation.

7.2.3 - Gear conflict: Prior to 1977, there was no commercial RKC fishery in Norton Sound. Board records indicate that in 1977 local residents who participated in the winter and summer subsistence harvest of king crab had their Norton Sound Fish and Game Advisory Committee propose to the Board to open commercial fishing in their area. At this meeting, the Department proposed seasons, size limits and harvest guidelines for the Nome section summer commercial fishery. Public testimony during this meeting indicated that local Nome residents would participate in the summer fishery, thus providing an alternate income to the herring and limited entry salmon fisheries. The Board allowed an experimental fishery in both the winter and summer during 1977 and an open fishery in 1978. Three local fishers tried to participate in the summer fishery, but were simply overwhelmed by the disparity of efficiency demonstrated by the Bering Sea crab fleet.

As addressed in staff reports to the Board during the 1978 shellfish meeting, public proposals from the Norton Sound Advisory Committee and the Norton Sound King Crab Fishermen's Association asked that pot limits be established for the Norton Sound summer king crab fishery. The need for a controllable harvest and slower development of the fishery for local residents was stated as the justification. The public also proposed establishing the entire Bering Sea registration area as exclusive, stating that the original reasons for the areas nonexclusive designation, the full utilization of the areas fisheries due to the foreign allocation for some of these crab species, was no longer true as the fleet was already fully exploiting the crab resources from this area. The need to control the rapidly expanding and highly mobile "Bering Sea" crab fleet, capable of catching the existing harvest quotas from this area in very short periods of time then moving to other king crab areas in the state, was also an expressed concern.

This efficiency disparity never allowed local fishers to capitalize and develop into the fishery on their door step. Today, the Norton Sound summer RKC fishery is dominated by a mobile fleet of large

catcher-processors and catchers vessels. In short, the fishery was instituted in a fashion that unintentionally disadvantaged a component of the fishery, the local Norton Sound vessels. It is this inequity the Board seeks to resolve in establishment of the superexclusive registration area.

The Board finds no reason to believe a less mobile fleet of catchers and processors could not likewise harvest and market available stocks. Testimony by representatives from Norton Sound indicates that there are fishing vessels in that area capable of fishing these stocks, or capable of being modified to fish these stocks. Processing capacity is also available.

7.2.4 - Habitat Objective: The potential overharvest of existing RKC, and handling mortality of females and juveniles during a derby style opening, was concurrently a persuasive argument for the Board to employ superexclusive registration in Norton Sound. Despite the Board's 100 pot limit for the 1992 RKC season in Norton Sound, the largest fleet since 1981, 27 vessels, fished the opening. The Board determined it must either take dramatic action, or yearly face the potential of overharvest and possible stock damage, or total closure of the Norton Sound fishery.

7.2.5 - Vessel Safety: The Board altered the opening date of the fishery to July 1st to allow for the extension of an orderly fishery; the season was previously August 1 to September 3. The Board anticipates a higher participation by small vessels and a reduction in the number of pots fished. This will allow a longer season to provide for vessel safety and an extended harvest window to achieve harvest objectives.

7.2.6 - Due Process: The normal Board process, in conjunction with the appeals process outlined in the crab FMP, allows for adequate due process.

7.2.7 - Research and Management Objectives: The more orderly fishery resulting for the superexclusive designation will provide a better opportunity for the ADF&G area biologist to monitor, assess and manage for the health of this resource.

As the basis of these actions the Board notes the following:

Stock status: The Area Q3, Norton Sound, RKC stock is identified as a separate biological and geographical substock of RKC in the Bering Sea. Size at maturity is smaller than other BS/AI RKC stocks and the crabs themselves are distinct in appearance. This stock is currently only 1/3 of its legal male crab virgin biomass. (These stocks have been regularly surveyed by NMFS trawl gear since 1976. ADF&G pot studies were conducted from 1980 to 1985.) The legal male population available for commercial harvest is estimated at 3 million plus pounds. With controlled effort and minimization of deadloss and handling mortality, this stock is capable of

providing continuous opportunity for a subsistence fishery as well as sustainable winter and summer commercial fisheries.

Currently, the fisheries in Norton Sound are comprised of:

(a) RKC Subsistence fishery. A permit fishery recording daily effort and catch information is primarily conducted through the ice with hand lines and small pots. It averages over 100 participants, with fishing access greatly influenced by weather and ice conditions. There are no management concerns with this fishery.

(b) Winter RKC commercial fishery. In 1992, 13 participants harvested 7,478 RKC (21,177 pounds with a value of $76,000) for local and Anchorage markets. This fishery occurs November 15 - May 15 and presents no management concerns.

(c) Summer RKC commercial fishery. The summer commercial fishery is managed at a reduced exploitation rate of 10%, with a 15 mile closed area to protect females, under-sized males, and the availability of crab to the nearshore subsistence fishery. The number of legal males present in the fishery are estimated to be stable since 1985. Under present regulations, even with the 100 pot limit, the fishery is demonstrating extreme management concerns.

In 1992, 22 catcher and 5 catcher-processors vessels participated in a 48-hour derby style fishery that opened at noon on August 1. Despite implementation of a 100 pot limit for the 1992 season, excessive effort resulted in an inability to manage the fishery inseason; so the season closure date of August 3rd was set at the start of the season. This resulted in non-attainment of the harvest objective of 300,000 pounds (only 74,029 pounds had been taken). With the number and capability of the vessels in the area, the presence of fresh water and its associated deadloss mortality, the risk of overharvest of legal crab and mortality to prerecruit size crab was determined to be too great to conduct another opening to try to achieve the harvest objective.

Harvest effort: The Board reviewed management of the king crab fisheries covered by the FMP and the small guideline harvest level (GHL) fisheries in the Pribilof district, and the St. Matthews, and Norton Sound sections. These fisheries distinguish themselves as being particularly problematic for managers. Revisions to the St. Matthews section and Pribilof district pot limits and the opening dates by the Board are anticipated to increase the ability of the ADF&G to protect stocks near threshold by a reduction of effort and harvest rates. These management measures will allow the currently foregone harvest of available stocks in the Pribilof district to be harvested for the first time in several years.

In 1992, the blue king crab (BKC) fishery in the St. Matthews

section harvested 3.1 million pounds in 60 hours. In 1987-88, the last year the Pribilof fishery occurred, approximately 700,000 pounds of crab were harvested. In contrast, the Norton Sound RKC fishery is conducted on a harvest guideline of only 300,000 pounds. Though this is the smallest BS/AI RKC stock generally open for harvest, it is accessible to the same fishing effort that harvests the 207 million pound opilio and 38 million pound bairdi quotas.

Management options: In an effort to create a nondiscriminatory harvest opportunity on the comparatively tiny available surplus in Norton Sound Area Q3, the Board lowered the Norton Sound RKC pot limit to 50/40 pots consistent with the manner in which it regulated the Pribilof BKC fishery. The Board also changed the season opening date from August 1 to July 1 in order to increase opportunities for the vessels that choose to fish within the Norton Sound superexclusive area and season harvest attainment. The closing date was not changed from September 3. A change of date to September 15, concurrent with the St. Matthew and Pribilof fisheries, would have resulted in harvest of molting, soft-shell male crab and was therefore undesirable. Opening the fishery in July would increase likelihood of small vessels that participate in the local herring and salmon fisheries to harvest these stocks at a slower and more manageable rate. Larger vessels may still participate in the superexclusive 40/50 pot limit RKC fishery, but must necessarily evaluate whether the income derived from this harvest justifies loss of opportunity to participate in the six other brown, blue and red king crab fisheries.

Comments from the public and ADF&G staff reports on the subject of exclusive or superexclusive registration for the Norton Sound section revealed some particularly compelling aspects regarding commercial fisheries opportunities. The 1992 herring fishery, which recently has accounted for 80% of cash income earned by commercial fishermen in the Norton Sound section, did not occur due to the extremely late departure of the ice pack in 1992 and the absence of buyers. Additional information previously presented to the Board, relative to worldwide herring markets, leads to the conclusion that the current statewide abundance of herring available for harvest in the sac roe fisheries, all of which occur prior to the Norton Sound fishery, are capable of providing nearly twice the historical supply volume. Consequently, there is a strong likelihood that even if the Norton Sound sac roe herring fisheries occur in 1993, the product will likely command the lowest price in a severely depressed market.

The salmon fishery is also depressed in Norton Sound. Chum salmon were historically the bread and butter fishery of this area. These stocks are extremely depressed presently, and there is virtually no commercial fishery. Commercial harvest of king salmon in Norton Sound is only 2,000 - 3,000 kings. In "even years", when there is often abundant pink salmon runs, there are no markets available. In 1992 a small coho harvest occurred in the southwest corner of

the area with approximately 7,000 fish taken.

The Board finds that economic opportunity for commercial fishermen who participate in the Norton Sound fisheries, including local, non-local, resident and non-residents alike, are severely limited in the herring and salmon fisheries; and that crab alone remains as the only viable source of commercial fisheries income. The NPFMC recently came to similar conclusions in the development of the CDQ program.

Registration areas: Section 8.2.8 of the FMP provides that only the Board may consider exclusive registration to distribute effort, stabilize coastal community economies and create fisheries where less mobile vessels will be given an opportunity to participate. This may reallocate catch among different sized vessels; so findings as to the benefits are important. When the Board designates an area, district or section as exclusive, it must produce a written explanation that considers the six factors set out in 8.2.8 of the FMP. The following is a summary of the Boards consideration of those factors. Additionally, the Board agrees with, and incorporates by reference, the information presented by the Norton Sound Economic Development Corporation, (See Attachment 1 & 2):

1. **The extent to which the designation will facilitate proper management of the fishery:** The superexclusive designation, in conjunction with the reduced pot limit and the expanded season, will aid management in the following ways: a) due to the size of the catch quota, remote location of the fishery, and limited financial and personnel resources available to manage this fishery, the Norton Sound king crab fishery needs to be conducted over a longer period of time or slowed down in order to manage it properly; b) the designation will provide an orderly fishery which improves management precision so that the resource is not underharvested nor overharvested as occurs presently with the current management tools available; c) because of the small size of the stock, a more restrictive pot limit alone does not slow down or control fishery effort; d) a likely effect of decisions by crab fishermen will be that less larger capacity boats and more smaller boats will fish in Norton Sound thus reducing total daily catching capacity and slowing down the fishery; e) a slower paced fishery will reduce deadloss problems associated with the Norton Sound ice melt and fresh water lens and with longer soak times reduce handling mortality of females and juveniles.

2. **Extent to which such designation will help provide vessels with a reasonable opportunity to participate in the fishery:** a) all participants, both large and small boats, will have an opportunity to fish the Norton Sound king crab fishery under a superexclusive registration designation, but can not fish in other exclusive or nonexclusive registration areas in that

year. The FMP notes that "exclusive registration areas can help provide economic stability to coastal communities (see objective 7.2.2) or to segments of the industry dependent on an individual registration area's crab stocks, particularly if the character of the fishing fleet and the related industry participants depending upon the registration area's potential production would not be allowed movement to another registration area. This is particularly advantageous to the less mobile vessels if the area they fish is not the most profitable area for the more mobile vessels." b) few local fishermen have been able to participate in the Norton Sound king crab fishery in an cost effective manner due to the declining number of fishing days, the small size of the local boats, and the high costs required to purchase larger vessels and gear. In addition, the area lacks adequate harboring facilities for locally owned larger vessels which could compete with the larger Bering Sea crab boats; c) slowing down the fishery and increasing the number of fishing days as a result of superexclusive registration designation will help provide fisherman who own smaller boats an opportunity to participate in this fishery; d) local fishermen in Nome who helped initiate this fishery will be able to again participate.

3. **The extent to which such designation will help to avoid sudden economic dislocation: Established processing facilities and fishing fleets within a registration area may provide economic stability for the labor force and effected communities and may be destroyed or adversely affected by an in-season influx of mobile processing plants and additional fishing power:** a) information provided from the BSRCDP document and ADF&G, indicates that local fishers originally proposed the commercial fishery in their area and tried to participate, but were simply overwhelmed by the disparity of efficiency demonstrated by the Bering Sea crab fleet; b) fishing fleets and processing facilities located in the Norton Sound registration section are now underutilized because of the current management regulations. As a result local communities are already adversely affected by the in-season influx of mobile processing vessels and additional fishing power; c) there are over 150 herring skiffs in communities of the Norton Sound registration section; many are capable of participating in the summer king crab fishery if more time were available for fishing; d) fish processing and cold storage facilities located in Golvin, Moses Point, Unalakleet and Nome, which are not in use at this time, could function as delivery, handling, processing and shipping centers for locally harvested king crab thus provide local employment; with capital stimulation from crab processing these facilities could be up-graded to provide processing for local herring and salmon harvests; e) loans are available through NSEDC to help local fishers with vessel equipment and up-grades, crab

gear purchases, and assistance in marketing crab;

4. The extent to which the designation will encourage efficient use of vessels and gear: a) fishermen who own herring skiffs which are capable of participating in the crab fishery now use these boats only for a very brief herring fishery lasting only a matter of hours; short term prospects for herring are in doubt and these large herring skiffs can be easily modified to day fish out of local ports; b) fishermen will be able to use the same fishing boats they use for herring in the king crab fishery thus making more efficient and cost effective use of their boats.

5. The extent to which the economic benefits conferred by the designation will be offset by economic costs and inefficiencies: a) one potential distribution avenue for locally caught king crab currently under investigation is for live crab delivered to markets in Anchorage, Fairbanks and Japan during the summer tourist season; b) NSEDC's partner in the pollock CDQ fishery, Glacier Fish Company, and the Lower Yukon CDQ partner as well, have agreed to assist in distribution of king crab caught and delivered locally with the Norton Sound registration section; c) increased costs due to changes in economies of scale as a result of a possible shift in the sized makeup of the fishing fleet and location of processing from larger fishing vessels and mobile processors to smaller boats and shoreside delivery, handling, processing and distribution may be offset by added value in the product; in effect, a shift from a focus on increase product value (1992: $1.75/pound, winter: $3.50/pound); d) local fishermen who have not been able to participate will harvest the crab thus increasing local employment and income in a region of the state which is cash poor; e) since, as a fleet, there were no economic benefits for the participants of the 1992 fishery, and average participation over the past 10 years has averaged only 10 vessels per year (most all of whom also participate in the other BSAI highly profitable king and Tanner crab fisheries), the area designation should not pose significant costs to those not wishing to participate within a superexclusive area.

6. The extent to which other management measures could yield the results desired from the designation: a) some other management options such as further pot limit (maybe 25 pots) and vessel size limit reductions, or restrictive trip limits may be available; but these options would likely be more restrictive to all fishermen and raise management costs; b) no other management option would yield the desired results of a superexclusive registration for the Norton Sound section king crab fishery; c) given the fact that exclusive registration for the Bristol Bay RKC exists and has not served to restrict effort in the fishery, the Board could have

designated all king crab areas as exclusive, but this would could severely impact the larger vessel fleet. A designation of Norton Sound merely as exclusive might force some vessels to choose between the Bristol Bay RKC and the Norton Sound RKC fishery. However, given that the Bristol Bay RKC stocks are declining precipitously and the fact that crabbers were warned that due to conservation concerns, the 1993 season for Bristol Bay RKC may not occur, a simple exclusive registration might not provide the reduction of effort necessary to manage the Norton Sound fishery and address socio-economic goals. Therefore, the Board finds the more restrictive definition of Norton Sound as a Superexclusive registration area necessary, fair and timely. Furthermore, Board members found that examples 4, 5 and 6 on pages 8-30 and 31 of the FMP precisely fit the present scenario at Norton Sound.

The Board's overall assessment of the economic opportunity for commercial fishers who participate in the Norton Sound section fisheries, is that out of three available fisheries, herring, salmon and crab, two are in serious decline and the crab fishery remains as the only source of sustainable commercial fishery income. The FMP at section 8.2.8 allows the Board to consider exclusive registration areas to distribute effort, stabilize coastal community economies, and create fisheries where the less mobile vessels such as used in herring and salmon fisheries will be given an opportunity to participate.

The Board considered that there is an exclusive registration area for Bristol Bay RKC that has really not served to restrict effort in the fishery. Furthermore, implementation of a 100 pot limit for the Norton sound RKC fishery in 1992 rather than restricting the fishery resulted in an unprecedented participation by 27 vessels, 5 of which were catcher processors. The vessels were primarily a cross section of the Bering Sea Fleet; slightly over half are home ported in Seattle, the rest are ported on the Alaska Peninsula or in Dutch Harbor. Only one vessel from the Norton Sound area participated.

For these reasons, the Board acted to make Norton Sound superexclusive.

T.M. Elias, Chairman

Alaska Board of Fisheries

June 4, 1993

The Honorable Ronald H. Brown
Secretary
Department of Commerce
Washington, D.C. 20230

Re: Alaska Board of Fisheries explanation for the Bering Sea/Aleutian Islands Crab Pot Limit.

Dear Mr. Secretary:

The Alaska Board of Fisheries ("Board") manages the Bering Sea/Aleutian Islands (BS/AI) crab fisheries under delegated authority of the Fishery Management Plan for the King and Tanner Crab Fisheries in the Bering Sea/Aleutian Islands ("FMP"). Under the FMP, some management actions available to the Board are in the "frameworked" category, which requires consideration of certain general standards[1]. Under this category, in March 1992, the Board passed a limitation on the number of crab pots each vessel could use. Your predecessor, Secretary Franklin, did not disagree with the need for a pot limit, but filed an Interim Rule which overturned the Boards' pot limitation scheme after she determined it did not technically meet certain criteria of the framework standards.

The Board again addressed the issue of crab pot limitations at its February 2-10, 1993 meeting, during consideration of comprehensive management of king and Tanner crab fisheries, including those in the BS/AI. The meeting was publicly noticed, consistent with the Alaska Administrative Procedure Act, and was well attended by members of industry and concerned public. In addition, representatives from the National Marine Fisheries Service (NMFS), the North Pacific Fisheries Management Council (NPFMC), State of Alaska Office of the Attorney General (AAG), NOAA General Council and the Alaska Department of Fish and Game (ADF&G) were present.

Six of the current seven-member Board were present in both February 1993 and in the March 1992 when the original pot limits for the BS/AI crab fisheries were established. During the February 1993

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[1] Some standards are written in general terms which invite varying interpretations.

meeting the board considered the Secretary's concern relative to uniform pot limits in its deliberations and decisions. All materials, records and findings from the 1992 meeting and other related meetings were incorporated into the board's decisions on pot limits at the February 1993 meeting.

Since the pot limit regulation was part of a comprehensive approach, the Board provides you a list of the following reports and presentations it considered prior to its deliberations:

1. Biological Perspectives in Crab Management in Alaska. By Dr. Gordon Kruse, ADF&G

2. Summary of the Fisheries Management Plan (FMP) for Crab. By Dr. Ray Baglin, NMFS

3. Summary of the Invalidation of Crab Pot Limits by the Secretary of Commerce. By Jonathan Pollard, NOAA General Council, and Earl Krygier, ADF&G

4. Review of Pot Limit Alternatives. By Earl Krygier and Peggy Murphy, ADF&G

5. Report to Industry on the Eastern Bering Sea Crab Survey. By Dr. Robert Otto, NMFS

6. History of the Regulation for an Escape Mechanism in Shellfish and Bottom Pots. By Al Kimker, ADF&G

7. Tests of Galvanic Release for Escape Devices in Crab Pots. By Dr. A. J. Paul, Univ. of Alaska, Institute of Marine Sciences.

8. Starvation Resistance in Alaskan Crabs. By Dr. A. J. Paul, Univ. of Alaska, Institute of Marine Sciences

9. Biodegradable Escape Mechanisms for Pot Gear: A Summary. By Dr. Gordon Kruse and Al Kimker, ADF&G

10. Bitter Crab Syndrome in Alaskan Tanner Crab: Importance and Management Considerations. By Dr. Ted Meyers, ADF&G

11. Staff Report on Aquatic Farming (FRED). By Jim Cochran, ADF&G

12. Review of King and Tanner Crab Fisheries in the Southeastern Alaska and Yakutat Areas. By Tim Koeneman, ADF&G

13. Review of King and Tanner Crab Fisheries in the Prince William Sound Area. By Charlie Trowbridge, ADF&G

14. Review of King and Tanner Crab Fisheries in the Cook Inlet

Area. By Al Kimker, ADF&G

15. Review of Westward King and Tanner Crab Fisheries:

a. Kodiak, Chignik and South Peninsula. By Al Spalinger and Dave Jackson, ADF&G

b. Aleutians. By Mike Ward, ADF&G

c. Bering Sea. By Ken Griffin, ADF&G

d. Norton Sound. By Charlie Lean, ADF&G

16. Summary of the Crab Pot Buoy Sticker Program. By Ken Griffin, ADF&G

17. Mandatory Observer Program Overview. By Rance Morrison, ADF&G

18. Observer Program Data Analysis and Reporting. By Donn Tracy, ADF&G

19. Westward Region Research Report Programs:

a. PIT Tag Project (video/slide presentation). By Leslie Watson, ADF&G

b. Collector Project (video/slide presentation). By Forest Blau and Bill Donaldson, ADF&G

21. ADF&G Kodiak and South Peninsula Trawl Survey Overview (video/slide presentation). By Dave Jackson, ADF&G

22. Potential Economic Impacts of Alternative Pot Limits to Bristol Bay Red King Crab and Bering Sea C. opilio fishermen. By Dr. Joshua A. Greenberg and Dr. Mark Herrmann, Univ. of Alaska, Fairbanks, and Dr. Paul Hooker, NMFS/ADFG.

23. Overview of the FMP criteria and Magnuson Act standards. (Bonnie Harris, Alaska Office of the Attorney General).

Written materials concerning pot limits, including copies of communications between the State of Alaska, Office of the Attorney General (AAG), the Alaska Board of Fisheries (BOF), NOAA General Council, the National Marine Fisheries Service (NMFS), and the Secretary of Commerce, as well as written comments from the public received before the meeting, were provided to the Board in notebooks.

In all aspects of its discussions, the Board sought consistency with the Magnuson Act Standards, FMP objectives and the State of

Alaska mandate to conserve and develop resources by the application of recognized principles of management consistent with sustained long-term yield.

It is the Boards understanding that you must receive a written explanation of the reasons for the 1993 Board decisions to implement proportional crab pot limits before you can rescind the Final Interim Rule that overturned the uniform crab pot limits in 1992. The Board submits for your review the following explanation of its rationale and decision to institute proportional pot limits for the BS/AI fisheries in 1993.

Status of the crab fisheries

Staff reports and public testimony accurately describe the BS/AI Island crab fisheries as complex and interrelated. Fleet efficiency, due to increased capitalization, technological advances, numbers of vessels, and harvest capability, continue to plague and strain management. The current size of the fleet easily achieves the 1993 guideline harvests of 38 and 207 million pounds, respectively, from the C. bairdi and C. opilio crab stocks. However, for those fisheries targeting on stocks with harvest guidelines of less than 10 million pounds, (Bristol Bay red king crab (RKC) and St. Matthew blue king crab (BKC)), the Department is experiencing great difficulty in managing the fisheries for long-term sustained yield, due to high levels of effort.

As the North Pacific Fishery Management Council (NPFMC) seeks to address the long term problems of overcapitalization in the Federal arena through implementation of a vessel moratorium and Individual Fishing Quotas (IFQ's), the Board acted to address the immediate problems caused by an overcapitalized crab fleet. Recognizing that the NMFS Report to the Industry on the 1992 Eastern Bering Sea Crab Survey indicates the harvestable surplus of RKC from Bristol Bay, BKC in the Bering Sea Districts, Tanner crab, C. bairdi in the Eastern District and Snow or C. opilio in all districts, and hair crab in the Bering Sea district, are all expected to continue on a downward trend, the Board was compelled to take conservative management actions.

Currently, the fleet begins the crab seasons by targeting the smaller guideline harvest level (GHL) fisheries of Norton Sound, St. Matthew Islands and the Pribilofs during the late summer and early fall. Effort levels fluctuate with varying degrees of predictability based on a number of factors such as: previous years fishery performance, market conditions, availability and profitability of tending jobs in the salmon fisheries, and most recently, the time lapse between the closure of the winter tanner crab season and the opening of the late summer and early fall king crab fisheries. The Board heard staff reports indicating that due to decreased resource availability and increased fishing and processing effort, seasons were becoming shorter and less

manageable. This has contributed to extending crab fleet tie up time, the new interest in fishing small GHL fisheries, and the proliferation of crab pots by which each vessel attempted to capture harvest shares.

The 1992 St. Matthew BKC fishery saw heavy participation, 171 vessels, and a season closure announced prior to the season actually opening (which it did, but only for 60 hours). In the Pribilof district, even though the NMFS survey has indicated a harvestable surplus for BKC, the fishery has not opened for the last two years due to the Department's concern to provide for long-term sustained yield while facing an inability to control excessive harvest effort.

In 1992, a similar situation occurred in the Norton Sound RKC fishery, and like the St. Matthew fishery, the Norton Sound managers announced a 48 hour fishing period prior to the fishery actually opening. Although inseason observer reports indicated that the catch during the 48 hour fishing period would not reach the preseason GHL, (300,000 pounds), the fishery could not be reopened after the initial 48 hour period due to serious concerns of overharvest from the numerous (27) large vessel effort on a very small GHL. The Department's concern over its ability to control any overharvest on the legal crab stocks, prevent the excessive bycatch mortality to females and pre-recruits, and the lack of adequate enforcement precluded any additional fishing time considerations. These trends toward large uncontrolled fishing effort participating in areas where very small GHLs occur, is of great concern to the Board.

Beginning on November 1, after the fisheries with small GHLs are closed, the entire crab fleet, in excess of 320 vessels, distributes its effort between the Dutch Harbor, Adak, and Bristol Bay king crab fisheries. The 1992 Bristol Bay RKC guideline harvest range was 6.0 to 10.99 million pounds and provided significant economic benefit to the crab industry. Results of the NMFS trawl survey indicated that the abundance of female and legal male red king crabs has fluctuated for several years and is declining. Recruitment of juveniles has been poor, pre-recruit males are the lowest level recorded from a survey, and the combined abundance of small and large females is now at the second lowest level on record.

Characteristically, the Bristol Bay red king crab stock and the Bering Sea C. bairdi tanner crab stocks overlap and are present on the same grounds in the Eastern Bering Sea. This coincidental use of habitat creates a bycatch of C. bairdi in the RKC fishery, with its associated bycatch mortality, and a bycatch of RKC in the C. bairdi fishery resulting in an increased mortality on the females and pre-recruit RKC.

The 1992 Bristol Bay RKC harvest of 8 million pounds was taken in

just seven days; even with the implementation of a pot limit that vastly reduced the amount of gear participating in the fishery. The Department informed the Board that an extended season is critical to provide for in-season management of this, and any fishery.

A seven day period separates the termination of the Bristol Bay RKC fishery and the beginning of the Bering Sea C. bairdi fishery which occur on the same grounds. Generally, the C. bairdi harvest begins sometime after mid-November and continues until the GHL, (38.1 million pounds for 1993), is obtained, or the fishery is closed by regulation on March 31, whichever comes first. The Board identified obvious problems with this scenario given the bycatch problems in the fishery and the current depressed status of the RKC stocks.

On January 15, the C. opilio, (snow crab), season begins (1993 GHL of 207 million pounds). The majority of the fleet shifts their effort from the southeastern Bering Sea area where the RKC and C. bairdi overlap, to the large concentrations of snow crab found around and to the north and west of the Pribilof Islands and west of St. Matthew Island. Vessel effort has increased in the snow crab fishery during the past four seasons, from 168 to 250 vessels. Snow crab stocks are declining, and season length has shortened significantly. These stocks are expected to continue to decline for the next several years and will only increase when another strong cohort matures and recruits into the fishery.

There are areas in the Bering Sea that the snow crab and C. bairdi stocks overlap creating a hybridized tanner crab. Due to the lack of accurate hybrid identification, high mortality on sublegal C. bairdi harvested as hybrids during the snow crab fishery has been documented. Executing the snow crab fishery is also complicated by the advance and retreat of the ice edge that from year to year can dictate where the fishery will occur and influences the number of crab pots lost to ice movement through gear displacement or loss of buoys.

During the 1992 meeting, the Board anticipated post-season information would be available in 1993 to provide them with the information to determine whether a uniform pot limit produced the intended results outlined in FB 5-92 (its March 2-6, 1992 findings). Much of this information was not available since the Interim Rule overturned the pot limit during the longer tanner crab fisheries. Information gained from the RKC fishery was believed to be unique only to RKC.

The Secretary did not dispute the Boards 1992 findings of necessity for pot limits. However, the Secretary determined that the uniform pot limits adopted in 1992 did not meet the nondiscriminatory requirements of 8.2.7 in the FMP. The Board did not concur with the interpretation by the Secretary of Commerce that a uniform pot

limit discriminated against the large crab vessels; but for the purposes of this meeting, set aside these differences of opinion and undertook to develop a proportional pot limit compatible with the language contained in the FMP.

With this and other supporting information (including last years' deliberations), the Board began deliberations on implementation of proportional pot limits.

Goals and Objectives of the FMP are met by implementing a pot limit.

After receiving and reviewing staff, Advisory Committee and public reports and testimony, the Board made the following determinations:

Management - The Department stated that pot limits are a valuable tool that assists managers in anticipating effort on stocks and generates more precise in-season management. This additional precision allows managers the ability to control harvest surpluses without the potential of over harvesting stocks below threshold levels. Additionally, fisheries in areas with small GHLs can be prosecuted where previously an uncontrolled and unknown fishing effort would have precluded the Department's ability to manage for sustained yield.

Conservation - According to industry testimony, the reduction of gear deployed in the fishery as a result of the pot limit regulations has caused a direct decrease in the amount of gear lost. As the number of lost pots decreases, the associated mortality on crabs caught in "ghost" pots that continue to fish should also decrease. In addition, the Division of Fish and Wildlife Protection (FWP) stated that during their inspection of crab pots during the 1992 fisheries compliance with the 30 weight cotton twine escape mechanism regulation had increased to 91%, compared to only 50% during the previous year. The Board finds the increased regulation compliance to be a direct result to the reduction of the number of pots needed to be tended by the individual vessel operators.

Economic and Social - The Board engaged in extensive analysis of the Greenberg Economic Report and the reports and materials presented by the Department, relative to the proportional pot limit as it was developed.

The Board finds that vessels up to and including 125 feet in overall length and vessels over 125 feet in overall length, provide the most logical alternative for the identification of the vessel length categories. These two size categories were suggested by a wide array of industry representatives including catcher processors and small vessel operators. In addition, these size categories are consistent with the NPFMC vessel size classes under the moratorium.

The Greenberg et al. report demonstrates a 20% difference in gear performance between vessels within the two size class categories. A performance worksheet by the Department titled Bristol Bay Red King Crab Average Catch and Pot Number by Large and Small Vessels, shows from 1986 and 1990 vessels less than 125 ft caught on the average 21% fewer crabs per pot than vessels greater than 125 ft. Noting little difference in the gear performances in these two documents, the Board adopted the 125 foot length overall split and the 20% factor. By applying the 20% factor, the impacts of the proportional pot limits will fall substantially equally on each size category.

Based on the material presented in the worksheet; Proposed Proportional Small Boat (less than 125) Pot Limit Adjustment Factor, the Board chose to maintain 250 pots as the maximum allowed for large vessels. The application of the 20% formula justified the 250/200 pot limit selected by the Board. The Board applied a 20% reduction to the maximum number of pots in a fishery to estimate proportional pot limits for small vessels.

Since the effect of the proportional pot limit on both categories of vessels is substantially equal, the impact on all vessels in the fishery should be similar. The implications of the social impacts to this regulation should also be similar.

Habitat - The decrease in numbers of pots lost during the crab fisheries, and the increase in gear tending and biodegradable twine compliance improves the overall habitat.

Gear Conflict - Trawlers benefit in two ways. First from a reduction of lost pots that, when encountered, have damaged their nets. Second, with less pots on the ground, conflicts between user groups over grounds pre-emption has declined. In addition, crab vessel operators testified that grounds pre-emption by other crabbers, which previously occurred due to the saturation of the best fishing grounds by large numbers of pots from a few vessels, had also abated.

Enforceability - The 1992 season saw buoy stickers that were not satisfactory. An alternative will be in place for the 1993/94 season which resolves the technical problem occurring last year. FWP stated, that despite the difficulty with the stickers, compliance was high for the period when the pot limit and sticker requirement were in effect.

Efficiency of Fleet - Industry testimony supported the pot limit, explaining that the gear fished yielded a more optimal catch and made the investment in the gear more cost effective relative to the value of the catch.

In review of the performance of the pot limits, the Board determined that all Magnuson Act Standards and Chapter 7 of the FMP

objectives were met by proportional pot limits.

Board Action on Pot Limits - The Board established a 250/200 pot limit for the Bristol Bay RKC and the Bering Sea Tanner and snow crab fisheries. Given the length of the these crab fisheries (up to four months) and an anticipated decline in their GHL over the next several years, the Board finds that the amount of gear allowed at the proportional levels, adequate to allow harvest of the available surpluses and meet various standards and objectives consistent with the application of the pot limits in other fisheries. This consistency also aids in enforceability.

The Board set the following pot limits:

250/200: Bristol Bay red king crab; Bering Sea C. bairdi and C. opilio crab.)
75/60: St. Matthew blue king crab
50/40: Pribilof district, Norton Sound and St. Lawrence sections.

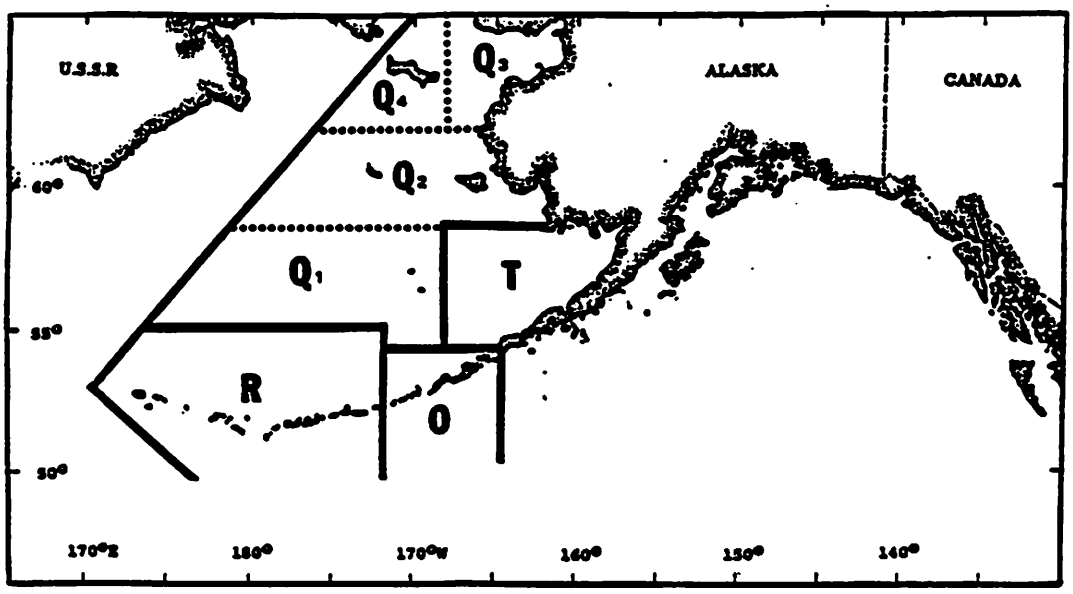
Section 8.2.7 (Pot Limits) of the FMP require the Board to consider, within constraints of available information, seven factors: (1) total vessel effort relative to GHL, (2) probable concentrations of pots by area, (3) potential for conflict with other fisheries, (4) potential for handling mortality of target or nontarget species, (5) adverse effects on vessel safety including hazards to navigation, (6) enforceability of pot limits, (7) analysis of effects on industry. These factors were largely addressed in the Boards' incorporated findings, FB 5-92, and further elaborated on at the February meeting, and reported in this explanation. Because the new pot limit has been developed in a nondiscriminatory manner to account for vessel size, affecting large and small vessels substantially equally, the Board believes it has now addressed the Secretary's concern.

Sincerely,

T.M. Elias, Chairman
Alaska Board of Fisheries

Enclosure

KING CRAB AREAS



TANNER CRAB AREAS

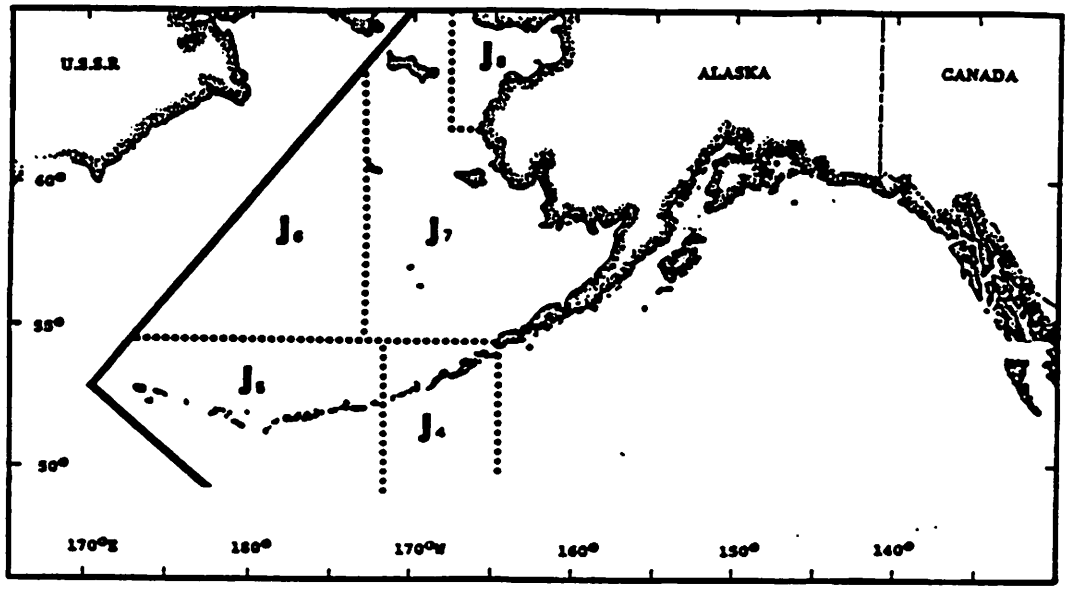


Figure 8.1 Bering Sea and Aleutian Islands Management Unit Showing State of Alaska Registration Areas for King Crab (O: Dutch Harbor; R: Adak; T: Bristol Bay; Q1: Pribilof District of Bering Sea; Q2: St Matthew Section of Bering Sea; Q3: Norton Sound Section of Bering Sea; Q4: St. Lawrence Section of Bering Sea). The entire management unit consists of a portion of one registration area for Tanner crab--the Westward Area (J) (J4: Eastern Aleutians; J5: Western Aleutians; J6: Western Subdistrict of Bering Sea; J7: General Section of Bering Sea; J8: Norton Sound Section of Bering Sea). The boundary of the management unit extends to the outer limit of the EEZ, and the seaward boundary of registration areas, districts, and subdistricts is fixed by State regulation.

data on pot registration and keel length could be used for developing pot limit regulations.

Only special types of situations warrant the use of pot limits. There are at least two such cases. First, because the deployment of excessive amounts of gear may result in high amounts of wastage due to pots lost to advancing ice cover, pot limits may be a useful measure to attain the biological conservation objective. Second, it may not be possible to satisfy conservation concerns in a fishery using excessive amounts of gear to catch a relatively small guideline harvest from a depressed stock. Lacking ability to regulate the total number of pots placed on the grounds, it would otherwise be necessary to prohibit the fishery from ever opening. A limited but highly valuable fishery would be foregone. In this instance, prohibition of the fishery would satisfy biological conservation concerns, but the economic and social objective would not be satisfied. Rather, a pot limit would provide a mechanism to attain the economic and social objective within biological conservation constraints.

8.2.8 Registration Areas

This FMP adopts existing State registration areas within the BS/AI fishery management unit. The management unit historically has been divided by the State into four king crab registration areas--Bering Sea, Bristol Bay, Adak, and Dutch Harbor and one Tanner crab registration area--Westward (Figure 8.1). Kodiak,

supported by a written finding by the State that considers all of the following factors to the extent information is available:

1. The extent to which the designation will facilitate proper management of the fishery.

2. The extent to which such designation will help provide vessels with a reasonable opportunity to participate in the fishery.

3. The extent to which such designation will help to avoid sudden economic dislocation. Established processing facilities and fishing fleets within a registration area may provide economic stability for the labor force and affected communities and may be destroyed or adversely affected by an in-season influx of mobile processing plants and additional fishing power.

4. The extent to which the designation will encourage efficient use of vessels and gear.

5. The extent to which the economic benefits conferred by the designation will be offset by economic costs and inefficiencies.

6. The extent to which other management measures could yield the results desired from the designation.

The following are examples of situations in which the designation or maintenance of the exclusive registration area might be appropriate:

1. The existence of differences in seasons between registration areas that could promote peak harvest rates only at the beginning of each season. Vessels capable of moving rapidly between areas could fish the season opening of more than one area, thereby creating an adverse impact on the vessels that planned on or were capable of fishing just one area for the entire season.

2. The occurrence of exvessel price settlements at different times in different registration areas, causing concentration of fishing and processing effort in registration areas that have completed price settlements.

3. Historic profitable utilization of the crab resource of an area by a fleet that could not be used to fish in more distant areas, and by processors heavily dependent for their supplies of crab upon the activities of that fleet.

4. Crab populations that vary in availability or on a seasonal basis may trigger effort shifts between registration areas to maximize the economic returns for a single segment of the overall fishing and processing effort. This provides a significant advantage for mobile processing units and larger vessels capable of operating in a wide range of sea

conditions, but which may not in any particular area be as efficient as the less mobile harvesting and processing units that they displace.

5. The crab fishing fleet has experienced rapid growth and advanced in fishing efficiency. There is, therefore, an increasing potential for overharvest of a particular stock, especially during normal fluctuations in crab populations. Situations may exist where, in the absence of limitations, the number of vessels registering for an area or district may possess a one-trip cargo capacity that exceeds the amount of crab that can be safely taken from that area. The absence of flexibility to modify registration areas in this instance could result in either no fishing or in an overharvest.

6. Registration areas historically fished by small vessels require a longer period of fishing time to harvest crab resources because they cannot fish in bad weather and have limited carrying capacity. Relatively low production levels of inshore fishing grounds combined with inshore migration of king crab stocks over a very long season provide the smaller vessels opportunity to maximize their production capabilities. Larger vessels designed primarily for areas of greater fishing power can adversely affect the economics of established fleets, processing facilities, labor forces, and community dependence on production from the local resource, while failing to maximize utilization of smaller crab stocks.

7. Since fleet capabilities have developed in response to demands within registration areas, they may vary significantly with regard to the volume of fishing gear (pot units) used, the ability to transport quantities of pot gear, and the severity of the weather in which they can fish. These factors and others can place a fleet comprised of mostly small vessels at a distinct disadvantage.

8. Some registration areas contain several discrete harvestable stocks of crab, which become available to the fishery at different periods during the season. These registration areas tend to develop fleets with less fishing power and also less overhead costs. The best yield from this type of fishery is usually attained by avoiding "pulse" fisheries, which harvest high volume from the immediately available stocks which tend to overharvest some stocks and underharvest others.

8.2.9 Closed Waters

Subsistence fisheries in the BS/AI area have been protected by closing to commercial fishing those waters fished in the subsistence fishery.

The FMP recognizes the current State regulations that prohibit commercial fishing for king crab in waters within 10 miles of mean

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MAR 30 [illegible]

March 26, 1993

CERTIFIED MAIL, RETURN RECEIPT REQUESTED

Mr. Laird A. Jones
Director
Division of Boards
Alaska Department of Fish
and Game
P. O. Box 25526
Juneau, Alaska 99802-5526

Re: Request that the Board Repeal Adoption of a Superexclusive Area for the Norton Sound King Crab Fishery
Our File No. 2363-8726

Dear Mr. Jones:

On behalf of the Alaska Crab Coalition, we petition the Alaska Board of Fisheries ("Board") to reconsider and repeal Proposal 312, the regulation adopted by the Board on February 8, 1993 establishing a king crab superexclusive area in Norton Sound. Section 9.3 of the Fishery Management Plan for the Commercial King and Tanner Crab Fisheries in the Bering Sea/Aleutian Islands (Jan. 24, 1989) (North Pacific Fisheries Management Council) ("Crab FMP") governs this appeal.[1] In addition, pursuant to AS 44.62.220 and 5 AAC 96.625, we petition the Board to repeal its action adopting Proposal 312.

We petition the Board to repeal Proposal 312 because the superexclusive area adopted by the Board is not authorized by the Crab FMP, the Magnuson Fishery Conservation and

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1 We note that Proposal 312 has not yet been signed by the Alaska Lt. Governor. Attachment 1. Therefore the regulation proposed in Proposal 312 as adopted by the Board is technically not yet a regulation as indicated by section 9.3 of the Crab FMP.

Management Act ("Magnuson Act"), and because Proposal 312 violates other federal and state laws. We ask that the Board take this petition up immediately.

PROPOSAL 312 IS INCONSISTENT WITH THE CRAB FMP

The Crab FMP allows king crab registration areas within management units only to be designated as either exclusive or nonexclusive. Crab FMP at page 8-27.[2] There is no provision in the Crab FMP for adopting a superexclusive area for crab. The Crab FMP would have to be amended to adopt a superexclusive area before the Board can legitimately adopt a superexclusive area in Norton Sound. Consequently, the Board's action in adopting Proposal 312 is unauthorized by, and inconsistent with, the Crab FMP. Therefore, the Board's action in adopting Proposal 312 is invalid.

The Crab FMP defines "Registration (statistical) area" as:

> According to the State regulations, a statistical area consists of a registration area comprising all the waters within the statistical area which are territorial waters of Alaska; and an adjacent seaward biological influence zone, comprised of all the waters within the statistical area which are not part of the registration area. Also, according to 5 AAC 34.010 and 5 AAC 35.010, king and Tanner crab regulations applicable to a registration area shall be applicable also in its adjacent seaward biological influence zone. For this FMP, the term registration area shall encompass the statistical area.

Crab FMP at page 4-4.

This definition does not include the term "superexclusive area" as part of an exclusive or nonexclusive registration area. Establishing a registration area is a framework-type measure that "the State can change following criteria set out in the FMP . . .." Crab FMP at page 8-1. "[I]mplementation of other management measures not described in the FMP must be consistent with the FMP, the Magnuson Act, and other applicable Federal law, and may occur only after consultation with the Council." Id. (emphasis added).

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[2] The Crab FMP adopts existing State registration areas in the Bering Sea/Aleutian Island fishery management unit. See Crab FMP at page 8-25. The Crab FMP does not incorporate a superexclusive registration area in Norton Sound.

The Board had an opportunity to consult with the NPFMC before adopting the Norton Sound superexclusive area, but did not. The Board could have followed the advice of the Pacific Northwest Crab Industry Advisory Committee (PNCIAC) as an advisory body for obtaining input and analysis of Proposal 312.[3] The Board did not.

On December 2, 1992, the PNCIAC opposed the formation of a superexclusive area.[4] The advisory committee found that Proposal 312 conflicted with the NPFMC's attempts to develop a comprehensive rationalization program for federal fisheries. The crab advisory committee also found that a superexclusive area would change catch histories and prejudice the analysis in the comprehensive management of crab fisheries.

The Crab FMP gives examples of situations in which the designation of an exclusive registration area may be appropriate. See Crab FMP at 8-31. The Crab FMP does not provide these examples as situations in which designation of a superexclusive area may be appropriate. The reason is because the Crab FMP allows designation of an exclusive registration area, but not a superexclusive area.

There is simply no authority in the Crab FMP for the Board to conclude that a superexclusive registration area is authorized as a category of exclusive registration areas. If the Crab FMP had envisioned a superexclusive area as a frameworked category that could be adopted by the Board, then the Council, when it adopted the Crab FMP, would have discussed, and authorized, the formation of a superexclusive area in the Plan.[5] The Board's adoption of the superexclusive area in Norton Sound is therefore not authorized by, and is inconsistent with, the Crab FMP.

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[3] The Crab FMP established the PNCIAC to serve the State in a consultative role on preseason and in-season management measures, just like all other existing State of Alaska Fish and Game Advisory Committees. See Crab FMP at page 2-7. See AS 16.05.260 (establishing advisory committees); 5 AAC 96 (functions and operations of local fish and game advisory committees).

[4] See Attachment 2 at page 4 (Minutes of the Dec. 2, 1992 PNCIAC meeting). While the PNCIAC advice addressed the formation of a superexclusive area in Bristol Bay, the analysis used by the PNCIAC would apply equally to Norton Sound. See also NPFMC and Alaska Fisheries Science Center, North Pacific Groundfish and Crab: A Review of Management Options for Comprehensive Rationalization (Oct. 20, 1992).

[5] Because the Crab FMP has designated certain actions that can be taken, all omissions should be understood as exclusions.. See Croft v. Pan Alaska Trucking, Inc., 820 P.2d 1064, 1066 (Alaska 1991); 2A Norman J. Singer, Sutherland Statutory Construction § 47.23 (1992).

Even if the Board may adopt a superexclusive area for crab in Norton Sound under the Crab FMP, the procedure used by the Board in adopting Proposal 312 is flawed and therefore invalid. The Crab FMP provides that

> any designation of an area as exclusive must be supported by a written finding by the State that considers all the following factors to the extent information is available:
>
> 1. The extent to which the designation will facilitate proper management of the fishery.
>
> 2. The extent to which such designation will help provide vessels with a reasonable opportunity to participate in the fishery.
>
> 3. The extent to which such designation will help to avoid sudden economic dislocation. Established processing facilities and fishing fleets within a registration area may provide economic stability for the labor force and affected communities and may be destroyed or adversely affected by an in-season influx of mobile processing plants and additional fishing power.
>
> 4. The extent to which the designation will encourage efficient use of vessels and gear.
>
> 5. The extent to which the economic benefits conferred by the designation will be offset by economic costs and inefficiencies.
>
> 6. The extent to which other management measures could yield the results desired from the designation.

Id. at 8-30.

No written findings accompany the Board's action. There is no indication that any of the factors set forth at 8-30 of the Crab FMP have been considered. The Board had information

available to it before it adopted Proposal 312,[6] but that information does not include the proper analysis of the necessary factors.

There is no information in the 1992 Norton Sound Shellfish Report on a superexclusive area in Norton Sound. The 1992 Norton Sound Shellfish Report does not discuss how a superexclusive area in Norton Sound will provide vessels with a reasonable fishing opportunity. Nor does the Report discuss the costs and benefits of the decision, give any economic analysis of, or provide alternative management measures to, a superexclusive area.

On the other hand, there is information analyzing a superexclusive Proposal in other fisheries that could have been used by the Board before adopting Proposal 312.[7] Since there was information to the Board that the Board did not use before adopting Proposal 312, it did not consider the necessary factors "to the extent information is available."

PROPOSAL 312 IS INCONSISTENT WITH ALASKA LAW

The Board's adoption of Proposal 312 does not address legitimate conservation or allocation interests. Instead, the establishment of a superexclusive area would only benefit a few fishermen. Since the record is completely silent about what the State's conservation and allocation purposes were in establishing the superexclusive area, the Board's action should be repealed and rejected.

To be a valid regulation, the regulation adopting a superexclusive area in the Norton Sound area must be consistent with and reasonably necessary to carry out the statutory purposes of the Board. State v. Hebert, 743 P.2d 392, 395 (Alaska App. 1987). The regulation also must be reasonable and not arbitrary. Id. See Meier v. State, 739 P.2d 172, 173 (Alaska 1987); Kelly v. Zamarello, 486 P.2d 906, 911 (Alaska 1971). There is nothing in the record that indicates that the Board's decision adopting Proposal 312 meets these standards. If the Board adopted Proposal 312 for conservation or development purposes, See AS 16.05.251(a)(2),

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[6] See Charles Lean & Fred Bue, 1992 Norton Sound District Shellfish Report to the Alaska Board of Fisheries (Jan. 1993) (Regional Information Report No. 3A93-01) ("1992 Norton Sound Shellfish Report"). Attachment 3.

[7] See University of Alaska, Draft Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis For the Exclusive Area Registration Proposal in the Bering Sea/Aleutian Islands and the Gulf of Alaska (Nov. 4, 1992) (Pages 1-1 and 1-4). Attachment 4.

these standards must be met.

There is authority for adopting superexclusive areas for the herring fishery in State of Alaska waters. State v. Hebert, 803 P.2d 863 (Alaska 1990). But that authority does not give the Board authority to adopt superexclusive areas for crab. This is because, first, herring is an nearshore fishery not managed by the NPFMC, but by the State. Crab fisheries are under the management of the federal government and subject to management provisions in the Crab FMP. Second, Magnuson Act provisions are not implicated in the management of herring fisheries addressed by the Board in Hebert. Magnuson Act provisions are implicated in Norton Sound king crab fisheries.

Further, if the Board's decision reflects an allocation decision that seeks to divide the crab resources in Norton Sound between competing subgroups of commercial fishermen, the Board may only do so after adopting criteria for the allocation of the crab resource using such criteria as the fisheries' history, number of participants, economic importance, and alternative fisheries. AS 16.05.251(e). There is no indication that the Board did so when it adopted Proposal 312.

A superexclusive area in the Norton Sound king crab fishery impedes fishermen's open access to, and common use of, the king crab fishery there. See Alaska Constitution, Art. VIII. The proposed regulation will require vessels to choose whether they wish to fish in or out of the superexclusive area. If a vessel chooses to crab in the Norton Sound superexclusive area, the vessel will be precluded from crabbing in Bristol Bay, Adak, and St. Matthews Island areas. See Crab FMP at page 8-27-28. This will result in a potentially significant impact on the vessels that have historically operated in Norton Sound and elsewhere.[8] This amounts to an allocation of crab that must meet statutory and regulatory requirements. See AS 16.05.251(e) and 5 AAC 39.205. The Board violated these provisions when it adopted Proposal 312.

PROPOSAL 312 IS INCONSISTENT WITH THE MAGNUSON ACT

To be consistent with the Magnuson Act, the Board's decision to create a superexclusive area in Norton Sound "shall" be consistent with each of the seven national standards set forth in 16 U.S.C. § 1851(a). Violation of any one of the national standards makes Proposal 312 invalid. The superexclusive area in Norton Sound violates at least four of the national standards

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[8] The number of vessels crabbing in Norton Sound in 1992 was 27. This number ranges between 0 and 36 between 1977 to 1992. Attachment 3 at page 9, Table 1.

under the Magnuson Act.

National standard two provides that "[c]onservation and management measures shall be based upon the best scientific information available." Id. § 1851(a)(2). The Board, under this standard, is to at least use the information that is available when making a decision.

There was information available to the Board on the available opportunities for crabbing, possible economic dislocations resulting from various management measures, efficiencies of gear use, and economics of the fisheries.[9] The Board did not use or consider this information when it made its decision to adopt Proposal 312.

The federal crab advisory committee found that Proposal 312 conflicted with the NPFMC's attempts to develop a comprehensive rationalization program for federal fisheries.[10] The crab advisory committee also found that a superexclusive area would change catch histories and prejudice the analysis in the comprehensive management of crab fisheries. The Board did not consider PNCIAC's advice.

There is no information in the record that the Board used data and analysis from the NPFMC's comprehensive rationalization program when it adopted Proposal 312. The Council's Comprehensive Rationalization program has excellent information available that the Board should have considered and analyzed before adopting Proposal 312. Since the Board did not base its decision to adopt Proposal 312 on the best scientific information available, the Board's decision creating a superexclusive area in Norton Sound violates the Magnuson Act's national standard two and is therefore inconsistent with the Magnuson Act.

National standard three provides that "[t]o the extent practicable, an individual stock of

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[9] For example, some of the studies that address these issues include D. Larson, Conservation, Allocation, and Enforcement Aspects of the Use of Pot Limits and Exclusive Areas in the Western Alaska Tanner Crab Fisheries: A Report to the Alaska Board of Fisheries and the North Pacific Fishery Management Council (1984); Matulich, Hanson, & Mittelhammer, A Bioeconomic Simulation of the Alaskan King Crab Industry (Washington State University, Unpublished Report) (1987); Katz & Bledsoe, Alaska Shellfish Regulations: Present Impacts on Fishery Participants, 106 Transactions of the American Fisheries Society 505-29 (1977); Otto, Management and Assessment of Eastern Bering Sea King Crab Stocks (1986); Otto, Management of Alaskan King Crab Stocks in Relation to the Possible Effects of Past Policies (Proceedings of the International King Crab Symposium, University of Alaska) (Alaska Sea Grant Report No. 85-12) (1985), at 447-81. See also Comprehensive Rationalization Plan, supra note 4.

[10] See Attachment 2.

fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination." Id. § 1851(a)(3). The superexclusive area in the Norton Sound area violates this standard because the king crab stock is being divided up and managed separately within each superexclusive area. Standard three is therefore defeated.

National standard four provides:

> Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out is such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

Id. § 1851(a)(4). Standard four incorporates prohibitions on state regulations that discriminate against citizens of another state. See Hicklin v. Orbeck, 437 U.S. 518 (1978). Proposal 312, in effect, discriminates against nonresidents of Alaska in favor of Norton Sound residents.

There has been no showing of a necessity to allocate the crab fishing privileges in Norton Sound. The manner in which Proposal 312 will be carried out will be such that an excessive share of the king crab resource will go to Norton Sound residents. This discriminates against nonresidents of Alaska. This is not "fair and equitable to all United States fishermen". National standard four of the Magnuson Act is therefore violated.

The Board's adoption of Proposal 312 is also not reasonably calculated to promote conservation. The practical effect of Proposal 312 is to keep vessels that are from outside the State and typically fish in many areas adjacent to the State, from crabbing anywhere else in State waters if they crab in Norton Sound. Simply allocating the Norton Sound king crab to local residents, at the expense of nonresidents, is not promoting conservation. There is no information that the Board is promoting conservation; instead the action preserves crab for resident crabbers and keeps nonresident fishermen out of the area. There is no evidence that this action is reasonably calculated to promote conservation.

In addition, through adoption of Proposal 312, the Board is not allowing the Norton Sound king crab fishery to be carried out is such manner that no particular individual, corporation, or other entity acquires an excessive share of the privilege of fishing for king crab in the Norton Sound area. Indeed, by establishing a superexclusive area in Norton Sound, area residents who register for the king crab fishery in the Norton Sound area obtain an exclusive

privilege to crab there. This too violates standard four of the Magnuson Act.

National standard five provides that "[c]onservation and management measures shall, where practicable, promote efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose." Id. § 1851(a)(5). Since there is no information in the record to support the Board's adoption of Proposal 312 as a conservation or development regulation, the Board's action is meant to bestow an economic benefit on a few crab fishermen in the Norton Sound area. Sound, reasonable conservation purposes do not support the Board's decision.

The Board had no information that it would promote efficient utilization of the king crab resource. Reserving the king crab resource for local residents promotes an economic allocation for the benefit of a few and does not promote efficiency in the use of the fishery resource. The action by the Board in adopting Proposal 312 is simply an economic allocation of the Norton Sound king crab resource to resident fishermen. The Proposal's purpose appears to be solely an economic allocation. Thus, the Board's action violates standard five.

PROPOSAL 312 IS INCONSISTENT WITH OTHER FEDERAL LAW

The superexclusive area in the Norton Sound area treats similarly situated fishermen differently. Proposal 312 favors local residents of Norton Sound over crab fishermen living in other parts of the state and in other states. The record does not support a rational basis for the superexclusive area in Norton Sound. Therefore the Proposal 312 violates the commerce, privileges and immunities, and equal protection clauses of the United States Constitution. The Proposal discriminates against nonresidents of the State in favor of local residents. The proposal burdens interstate commerce and is not outweighed by putative local benefits. In addition, the Board did not consider whether the goal sought by adopting the superexclusive area in the Norton Sound area (i.e. local economic benefits) could be promoted as well with a lesser impact on interstate activities. Thus, Proposal 312 should be repealed on this basis.

CONCLUSION

In summary, we request that the Board repeal Proposal 312, which adopted a superexclusive area in Norton Sound. The Board's action adopting Proposal 312 violates the Crab FMP, the Magnuson Act, and other federal and State laws. If the Board denies this petition, we request a detailed, written explanation of the Board's denial pursuant to AS

16.05.251(c) and AS 44.62.230 and copies of any reports, studies, or documents that were provided to the Board or are part of the Board's record of decision when it adopted Proposal 312. If you have any questions, please do not hesitate to contact me.

Very truly yours,

Bruce Weyhrauch

Bruce B. Weyhrauch

Enclosures

cc: NOAA, Office of General Counsel, Alaska
✓Rick Lauber, Chair, North Pacific Fisheries Management Council
Crab Interim Action Committee
Nancy Foster, Deputy Assistant Administrator, National Marine Fisheries Service
Pacific Northwest Crab Industry Advisory Committee

BBW:db:Jones.2lt

APR 13 '93 5:01 TO NPFMC

PACIFIC NORTHWEST CRAB INDUSTRY ADVISORY COMMITTEE
P.O. Box 97019
Redmond, Washington 98073-9719
Tele: 206 881 8181 Fax: 206 882 1660

April 12, 1993

Rick Lauber, Chairman
North Pacific Fishery Management Council
P.O. Box 103136
Anchorage, Alaska 99510

RE: ALASKA BOARD OF FISHERIES DECISIONS AND BS/AI CRAB FMP

Dear Rick:

The PNCIAC held a meeting on April 6th, to review recent Alaska Board of Fisheries decisions on Bering Sea crab fisheries and to review the 1993 Bering Sea tanner crab fisheries. During the course of this meeting, the committee raised a number of concerns and developed the recommendations and requests as follows below.

1. The committee members expressed frustration regarding its effectiveness as an advisory body to the Alaska Board of Fisheries. The committee felt that its recommendations to the Board of Fisheries for the recently concluded shellfish meeting were not appropriately considered as contemplated by the BS/AI Crab FMP. For the record, the committee notes that it has an advisory role to not only the State of Alaska (like other State advisory committees), but also to the North Pacific Fishery Management Council on relevant crab matters.

2. The committee also noted that in the case of the recent shellfish meeting, they were not provided with adequate information by ADF&G in regards to the issues of pot limits and the shellfish observer program. This frustrated the committee in trying to fulfill its role as an industry advisory body under the guidelines of the Bering Sea/ Aleutian Islands Crab FMP.

The committee notes for the record a memorandum of December 3, 1992 to Larry Nicholson, Westward Regional Director, ADF&G requesting relevant information on pot limits, superexclusive registration and the observer program for the January 5, 1993 meeting of the Pacific Northwest Crab Industry Advisory Committee. (enclosure)

The committee also notes a letter of January 13, 1993, to Clarence Pautzke, Executive Director, NPFMC expressing the frustration of the PNCIAC with a lack of information on vessel sizes and comparative catches and a general lack of guidance from ADF&G and NMFS at the January 5, 1993 meeting in preparation for the February 2, 1993 meeting of the Alaska Board of Fisheries. (enclosure)

3. In regards to the Board of Fisheries decision designating the Norton Sound king crab fishery a superexclusive registration area, the committee requests that the Council instruct the NMFS Regional Director to provide a a legal opinion on the consistency of this action with the Crab FMP and the MFCMA, as soon as possible. The Norton Sound season is scheduled for August first.

4. Concerning the decision to open the Pribilof Islands and St. Matthews Island king crab fisheries on the same date September 15th and to close both areas on the date the first one is to close, the committee recognizes that this decision creates de facto superexclusive registration areas and this could preclude optimum yield for one or another of the fisheries and an apparent violation of the Crab FMP and the MFCMA. The committee requests that the Council also instruct the NMFS Regional Director for legal clarification on this action in a timely manner.

5. Regarding the ADF&G Shellfish Observer Program, the committee notes that the Board of Fisheries made extensive changes to the program through revisions to the Observer Manual.

The committee requests that the NPFMC convene a meeting of its Observer Oversight Committee in the near future for the purpose of reviewing the revised shellfish observer manual for consistency with the Crab FMP, the MFCMA and other applicable federal statutes.

6. As a result of the committee's discussion of an industry petition for reopening the opilio fishery in a Northwestern portion of the Bering Sea, the PNCIAC requests that the Council instruct ADF&G to make use of, in addition to survey data, in season catch and observer data and to make comparisons with other analyses and information available within NMFS. Additionally, this information should be incorporated into in season management of the Bering Sea crab fisheries. In season data and revised analyses and other relevant information should also be made available to the PNCIAC, the NPFMC and interested persons from industry in a timely manner during the season.

The PNCIAC also noted for the record its concern that over the past year an obvious deterioration in the dialogue between ADF&G and the NMFS has developed, particularly in the exchange of in season crab catch data.

A reduction in the dialogue between the managing agencies can only lead to misunderstandings, communication problems with industry and an overall deterioration in the fisheries management process.

The Pacific Northwest Crab Industry Advisory Committee hopes the NPFMC will address its concerns in an expeditious manner.

Sincerely,

Richard C. White, Chairman
Pacific Northwest Crab Industry Advisory Committee

cc: Tom Elias, Chairman, Alaska Board of Fisheries
Carl Rosier, Commissioner, ADF&G
Bob Turner, Director, WDF
Steve Pennoyer, Regional Director, NMFS, AKR
Nancy Foster, Acting Assistant for Fisheries, NMFS

AGENDA D-1
JUNE 1993
SUPPLEMENTAL

PACIFIC NORTHWEST CRAB INDUSTRY ADVISORY COMMITTEE

Chairman, Richard C. White
P.O. Box 97019, Redmond, WA 98073-9719
Tele: 206 881 8181; Fax: 206 882 1660

TELECOPIER COVER LETTER: RETURN FAX NO. 206 547 0130

PLEASE DELIVER THE FOLLOWING PAGES:

TO: Larry Nicholson, Westward Director

FROM: Arni Thomson, Secretary, PNCIAC *Arni Thomson*

DATE: 12/3/92

TOTAL NUMBER OF PAGES (including cover page): 1

MESSAGE/COMMENTS:

1. Next meeting of PNCIAC scheduled for January 5th, NMFS, Bldg. 4, Room 2079, Sand Point Way, Seattle, WA. Time: 8:30 am - 4:30 pm.

2. Issues for which PNCIAC needs information and ADF&G recommendations:

   Revised pot limits, ADF&G proposals

   Tanner crab size limits and identification, ADF&G (and DPS) recommendations

   Exclusive and superexclusive registration proposals in the BSAI, ADF&G recommendations

   Observer program presentation and recommendations

   14 day pre and post season prohibition on use of groundfish pots in crab registration areas of BSAI, amendment needed to allow for immediate crossover into cod pot fishery in the event of split season for opilio i.e. waiver of both 14 day periods in the district that is closed, the Eastern district east of 173 degrees. Need for emergency rule.

Should you encounter any problems during this transmission, please contact the PACIFIC NORTHWEST CRAB INDUSTRY ADVISORY COMMITTEE at 206 547 7560, Arni Thomson, Secretary.

OUR TELECOPIER DIRECT LINE IS: 206 547 0130.

OPERATOR: *AT*

cc: F. Krygier, K. Griffin

PACIFIC NORTHWEST CRAB INDUSTRY ADVISORY COMMITTEE

Richard C. White, Chairman
P.O. Box 97019, Redmond, WA 98073-9719
Tele: 206 881 8181/Fax: 206 882 1660

DATE: January 13, 1993

TO: Clarence Pautzke, Executive Director
NPFMC

FROM: Richard C. White, Chairman
Pacific Northwest Crab Industry Advisory Committee

RE: RESPONSE TO NPFMC REQUEST FOR RECOMMENDATIONS ON BERING SEA POT LIMITS AND THE OPILIO OY

POT LIMITS:
The PNCIAC spent several hours discussing the issue of pot limits at its January 5th, 1993 meeting in Seattle.

The committee and the industry present were frustrated in their attempts by a lack of information on vessel sizes and comparative catches and also by a general lack of guidance from the Alaska Dept. of Fish & Game and the National Marine Fisheries Service on the types of solutions that would pass legal review.

However, with limited information available to them, the PNCIAC did move ahead with developing a framework proposal in response to your request and for the Board of Fisheries to consider in its deliberations.

Prior to developing this proposal, the committee discussed setting up vessel category lengths as a framework for pot limits, as they were inclined to feel that this would be the preferred alternative the Board of Fisheries would be likely to pursue. However, there was insufficient information available to them on vessel sizes, which would have enabled identifying some natural breaking points for vessel classes.

They were also concerned that setting up vessel classes could also be very controversial, especially with vessels that fall slightly under the next vessel class size. This could be viewed as discriminatory and it could result in further legal appeals.

Therefore the PNCIAC moved ahead with the following recommendations:

1. Establish a formula for pot limits in the Bering Sea fisheries based on a maximum of 2.5 pots per linear foot of vessel length, as measured by length overall and a minimum of 1 pot per linear foot, length overall. The motion covers only those fisheries to which the pot limits were recently overturned by the Secretary of Commerce.

2. The pot limits are to be linked to a sliding scale of guideline harvest levels. The same formula is to be used for all the crab species and a minimum of no less than 1 pot per linear foot of vessel length is recommended.

less than 5 million #---1 pot/foot of length overall

5 million # to 7.5 m#---1.5 pots/foot of length overall

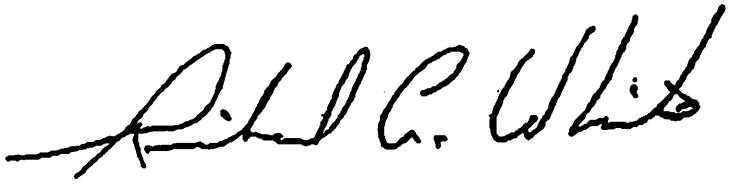
7.5 million # to 10m#---2 pots/foot of length overall

10 million # and over--2.5 pots/foot of length overall

Further discussion about pot limits, in response to the NPFMC's question #4, led to consensus on the PNCIAC that the BSAI Crab FMP not be amended to allow for discriminatory regulations for any vessel size classes.

OPILIO OY:
After a brief discussion and hearing from Jerry Reeves what options were being discussed by the plan team, the PNCIAC adopted a motion recommending the NPFMC develop an amendment to the crab FMP to framework the opilio OY, to allow for setting an annual GHL according to the annual survey and population estimates and disregard the cap.

The minutes of the PNCIAC meetings of December 2nd and January 5, 1993 are provided for the NPFMC administrative record.



North Pacific Fishery Management Council

Richard B. Lauber, Chairman
Clarence G. Pautzke, Executive Director

605 West 4th Avenue
Anchorage, Alaska 99501

Mailing Address: P.O. Box 103136
Anchorage, Alaska 99510

Telephone: (907) 271-2809
FAX: (907) 271-2817

January 27, 1993

Mike Martin, Chairman
Alaska Board of Fisheries
ADF&G Division of Boards
P.O. Box 25526
Juneau, AK 99802-5526

Dear Mike:

At our recently completed January meeting, the Council discussed the issue of the State of Alaska Shellfish Observer Program and how it would be integrated with the federal Groundfish Observer Program under the umbrella of the North Pacific Fisheries Research Plan (Research Plan). The Research Plan adopted by the Council last June was developed in coordination with the State of Alaska and will bring the crab fisheries under the Observer Program funding mechanism, if approved by the Secretary of Commerce this spring. Under the Research Plan, levels of observer coverage will be reviewed annually and, depending on the funds available from fees collected under the Plan, may be adjusted according to the needs of each fishery. The framework for the Research Plan also addresses potential changes to the Shellfish Observer Program, noting that such changes may be made through the Council/Board process in accordance with the King and Tanner Crab Fishery Management Plan.

The Research Plan also mandates annual reports which detail coordination between the groundfish and shellfish portions of the program, with the intent being to attain functional and administrative efficiency of the overall program. Finally, the Research Plan established an Observer Oversight Committee (Committee) comprised of industry representatives, including crab fishing and processing representation. A primary purpose of this Committee is to review the Observer Program annually and make recommendations to the Council regarding observer needs for the upcoming fishing year. At this past January meeting, the Council heard concerns from representatives of the crab fishing industry as to whether the process outlined under the Research Plan would fully embrace input from this sector regarding observer coverage requirements in the crab fisheries. Part of this concern apparently stems from the differing authorities of the Council and the Board, and from the different meeting schedules of the two bodies.

To alleviate this concern, and to assure maximum efficiency of the overall program, the Council wishes to recommend to the Board that they recognize the recommendations arising from the Observer Oversight Committee as they relate to the crab fisheries. I would reiterate that one of the goals of the Research Plan is to dovetail the groundfish and shellfish programs to the maximum extent possible. The annual process frameworked under the Research Plan, of which the Committee is an integral part, will be an important part of coordinating the two programs. Please contact me if you have any questions on this issue. A representative of the Council will be attending your Board of Fisheries meetings during the first week of February as well.

Sincerely,

Chris Oliver
Deputy Director

BOF

HLA/CORR

ALASKA CRAB COALITION

3901 Leary Way (Bldg.) N.W., Suite #6 • Seattle, WA 98107 • (206) 547-7560 • FAX (206) 547-0130

DATE: January 8, 1993

TO: Rick Lauber, Chairman
North Pacific Fishery Management Council
P.O. Box 103136
Anchorage, AK 99510

FROM: Arni Thomson, Executive Director

RE: AGENDA ITEM D-1, BSAI CRAB MANAGEMENT RECOMMENDATIONS FOR ADF&G SHELLFISH OBSERVER PROGRAM RELATIVE TO THE FISHERIES RESEARCH PLAN

The attached correspondence to the Alaska Board of Fisheries concerning recommendations for improvements to the shellfish observer program have been developed after lengthy discussions with crab vessel owners, processing companies and observer contractors.

The recommendations have also been reviewed and endorsed by the Pacific Northwest Crab Industry Advisory Committee at its meeting on January 5th, 1993.

The ACC requests that the NPFMC endorse these recommendations for improvements to the ADF&G shellfish observer program and that the Coucil include its recommendations along with its comments on the pot limits issue.

cc: Steve Pennoyer, RD, NMFS

ALASKA CRAB COALITION

3901 Leary Way (Bldg.) N.W., Suite #6 • Seattle, WA 98107 • (206) 547-7560 • FAX (206) 547-0130

January 7, 1993

TO: Mike Martin, Chairman
Alaska Board of Fisheries
P.O. Box 3-2000
Juneau, AK 99802

FROM: Arni Thomson, Executive Director

RE: RECOMMENDATIONS FOR ADF&G SHELLFISH OBSERVER PROGRAM RELATIVE TO THE FEDERAL FISHERIES RESEARCH PLAN

BACKGROUND:

It has been a goal of the ACC since 1988, when it originally submitted a proposal to develop the onboard crab observer program, to develop a credible cost efficient program that would yield useful biological information as well as take care of enforcement concerns related to the harvest of sub legal male crabs.

It is widely recognized that the ADF&G shellfish observer program and manual need revisions to relieve industry of burdensome provisions that create unecessary logistical delays and excessive costs. A primary example is the requirement that all testing, deployment and debriefing of observers must take place only in the distant port of Dutch Harbor. However, the City of Anchorage is centrally located as a transit point to both Gulf of Alaska and Bering Sea fisheries. Due to its location and available fiacilities, it would be a cost effective additional deployment site.

In addition, very little of the data collected is being made available outside the offices of ADF&G, to either industry or the NPFMC.

Age class data on samples of recruit and pre recruit discards could also be systematically aggregated and used in conjunction with the once-a-year NMFS trawl survey to improve the statistical confidence level of the population projections.

These recommendations are therefore made in the interest of reducing the delays and excessive costs, improving the quality, availability and use of biological data and to eventually integrating this program into the federal Fisheries Research Plan.

The ADF&G Shellfish Observer Program is to be reviewed by the Board of Fisheries at its February 2nd-10th meeting in Anchorage. The Board operates on a three year cycle in terms of review of regional fisheries. Thus it is likely that the Board will not review changes to the observer program again until March of 1996.

On the other hand, it is likely that the NMFS and NPFMC will be initiating the startup of fee collection for the federal Research Plan observer program (crab and groundfish) in 1993. The new observer program itself could start up as early as January 1994 and should include some integration of training and debriefing of shellfish and groundfish observers.

Thus it is important at this time that the Board of Fisheries consider some changes in that regard for the ADF&G shellfish program now, to establish the regulatory framework that will enable integration of the programs in 1994.

ADF&G recognizes the need for some coordination, at least in terms of accessing the funds, as it has submitted a proposal for funding of shellfish samplers for shorebased plants from the Research Plan, as noted below.

RECOMMENDATIONS:

1. SYSTEMATIC RECOGNITION OF DUAL CERTIFICATION OF OBSERVERS: ADF&G and the NMFS need to recognize dual certification of observers effective the date of implementation of the Federal Fishery Research Plan.

ADF&G has requested funding of shellfish observers from the industry funded observer program for shorebased plants. (Reference Proposal #350, ADF&G.) This will in some cases mandate two observers for the plants during concurrent groundfish and shellfish seasons, an unnecessary cost burden for the industry, particularly during slow seasons.

2. STANDARDIZE TESTING, CERTIFICATION, DEBRIEFING AND DATA FORMATS, WHERE POSSIBLE: Actual certification of observers should be standardized for ADF&G and NMFS observers. The present ADF&G two step certification process, with inflexible 30 and 90 day debriefing deadlines is unnecessarily burdensome. NMFS program has one step certification at the 90 day level, with a flexible "check in after first trip" requirement.

Dual certification of debriefing personnel should also be established by ADF&G and NMFS agencies when the Research Plan goes into effect, to reduce logistical delays and to minimize administrative costs.

ADF&G should also be requested to develop computerized key punch observer forms at the earliest possible date. Both ADF&G and NMFS should coordinate on development of standardized data formats, to simplify analysis and review. There should also be an open exchange of observer data between the two agencies.

3. OBSERVER TRAINING AND DEBRIEFING IN ANCHORAGE: Observer training and debriefing at the University of Alaska Observer Training Center in Anchorage should also be recognized by both ADF&G and NMFS and integrated into the programs as soon as possible. The Center is offering offices at no cost to both agencies.

Seasonal debriefing of observers at St. Paul Island should also be started as soon as possible, as this would benefit both the shellfish and groundfish industry. These changes will generate tremendous savings in travel expenses for the shellfish and groundfish industry and simplify the logistics of deployment.

4. ESTABLISH AN INDUSTRY OVERSIGHT COMMITTEE FOR THE SHELLFISH OBSERVER PROGRAM, SANCTIONED BY THE BOARD OF FISHERIES AND THE NPFMC: Shellfish industry representatives need a voice in the management and operation of the industry funded program, as they requested the authorization of it at the federal level, both in the U.S. Congress and at the NPFMC. This committee would serve parallel to the NPFMC Observer Oversight Committee for groundfish. As presently, structured, the joint ADF&G/NMFS agency workgroup, sanctioned under the Research Plan does not provide for industry representation and systematic input.

5. ESTABLISH A CERTIFIED BILL OF LADING PROCEDURE FOR TRANSPORTING PROCESSED SHELLFISH ON CATCHER PROCESSORS: A certified bill of lading procedure should be established for crab catcher processors wishing to transport product to Seattle and other non Alaskan ports. The present requirement which calls for an observer to remain on board until the product is discharged is overly burdensome and unnecessary. A check in procedure for Dutch Harbor and non Alaskan ports can be established.

cc: Carl Rosier, Commissioner, ADF&G
Rick Lauber, Chairman, NPFMC
Steve Pennoyer, RD, NMFS

Crab Management in the Bering Sea and the Aleutian Islands?

By

Kristian E. Poulsen

&

Edward H. Poulsen

June 10, 1993

The concepts and philosophy of crab management in the Bering Sea and the Aleutian Islands has been unchanging over the last 25 years. The philosophical emphasis of management has been that of census taking and management initiatives have come primarily from industry. Examples of this include crab fishermen demanding a season and management relenting regardless of the health of the crab population. Processors desiring to harvest large crab to increase profits thus promoting management to implement large legal size limits. Processor influence has resulted in the harvest of single crab species in areas with multiple species of crab. Other examples abound.

What is believed to be management of crab is in reality management of industry with low emphasis on the resulting impact on various crab stocks.

In the last 25 years, the various crab stocks have undergone a dramatic change. A change from healthy crab stock in most areas, to a situation now that places most stocks in depressed or severely depressed status throughout waters around Alaska. A major factor which has contributed to this effect is a change in the climate.

Climatic fluctuations have been recorded for many years: Average temperatures have ranged from a low in 1885 to a high around 1940. The period from 1940 to mid 1970 experienced a cooling trend. Since the mid 1970's, we have been experiencing a gradual warming trend. As a result, British researchers' analysis shows that 1990 "was the warmest year in their 140 -year-long record" (Fackelmann 37). The warming climate has had substantial effects on fisheries in Alaskan waters, and throughout the world.

Cod, Yellowfin Sole, Halibut, and other predatory type fish of crab proliferate in

above average water temperatures producing large increases in the population of these stocks. This in turn has resulted in a general decline in the population of crab in Alaskan waters.

Russia is experiencing the same climatic conditions as those being experienced in Alaskan waters, but with very different results with respect to crab. Even with a large predatory fish population, crab stocks have remained healthy and sizable in Russian waters. So why have Russian crab resources remained healthy while Alaskan crab resources have been steadily declining? The answer seems to be the difference between the two management styles in regards to the issue of discarding.

Although very little information has been revealed about the nature of Russian crab management, it has been documented that Russia has a much smaller legal size limit. As an example, the legal size limit for Red King Crab in Russia is 120mm (4 3/4"). This policy allows for the minimization of discarding of crab. Discard mortality has been recognized as a problem in many other shellfish fisheries: Rock Lobster in Australia and South Africa, Spiny Lobster in Hawaii, and Stone Crab in Florida.

Tagging studies of Red King Crab in the Eastern Bering Sea conducted by NMFS and ADF&G have revealed a major decline in the percentage of tagged crabs being recovered. In 1976, 43.8% of the tagged, discarded crabs were recovered. This percentage has dwindled to an alarming 1.5% in 1987. It would appear that the great majority of tagged crabs are not surviving due largely to the increase in the stock of predatory fish. It is likely that the discards in the commercial fleet have experienced a similar survival trend as that recorded by the NMFS tagging studies. Management

principles must be altered to compensate for this fact.

During the Red King Crab season in the Eastern Bering Sea, Bairdi are discarded. When the Red King Crab season is finished, Bairdi fishing begins and Red King Crab are discarded. As a result, alarming amounts of Bairdi and Red King Crab are killed due to discarding, based on tagging studies which indicate decreasing survival trends since 1976. Management principles must be altered to reduce discarding by conducting the two fisheries at the same time. Areas with large populations of females and immature males should be made off-limits to all fishing efforts, such as the area East of 163' E in the Eastern Bering Sea.

On the main Opilio fishing grounds around the Pribiloff Islands, another discard fishery was created when the Bairdi season opening was changed to early November in 1990. Large scale discarding of Opilio occurs during this time until the Opilio season opens on January 15. The Opilio stocks, which have been the mainstay of the industry since the collapse of the Red King Crab and Bairdi stocks, have been very healthy until this recent development. Again, management principles must be altered to reduce discarding by conducting the two fisheries as the same time, in this area.

The success of the Opilio stocks can be credited to the lowest legal size limit of all crab stocks relative to the age of maturity. In essence, Opilio Crab can be harvested at a younger age than other species.

Discarded crab should be considered harvested crab. Assumptions that discarded crab live should not be made as can be seen by the tagging studies. If the mortality rate of discarded crab is factored in to the amount of legal and discarded crab harvested, all

crab resources are being over harvested.

Conservative harvest guidelines must be set and followed and harvest guideline levels should be reexamined. During 1980, the harvest guideline for Red King Crab was set well above a reasonable level due to industry pressure. This, along with intense discarding of Red King Crab in the early 1980's during Bairdi and Red King Crab seasons, accelerated the decline of the Red King Crab stocks. Francis Fukuhara states that "as many as 152 million sublegals and 20.8 million females may have been caught and returned to the sea in the 1980 Eastern Bering Sea King Crab fishery" (Fukuhara 131). He also states that for every legal Tanner Crab caught, 1.6 King Crab were discarded.

Management Principles which must be adopted as a result of changing climatic conditions are:

1. **Combine the harvesting of species which are fished in the same location.**
2. **Constrict, or reduce, the legal size limit of all crab species, except Opilio Crab in order to harvest from a wider age group. This does not mean increasing the harvest guideline.**
3. **Close areas with high populations of females and immature males to all fishing.**
4. **Conservative harvest guidelines should be implemented that count discards as harvested crab.**

Healthy and abundant crab stocks will result in the future if these management practices are followed.

With no change to the current management scheme, all waters around Alaska will soon be like those found in Kodiak Island waters, with no commercial populations of crab available.

I do not intend to cause hard feelings or point a finger at any person or organization by this letter. Instead, my sole purpose for writing this letter is to see to it that the crab resources in Alaskan waters are managed in a way which will benefit the resource, industry, and ultimately the consumers as a result of a more plentiful and less expensive product.

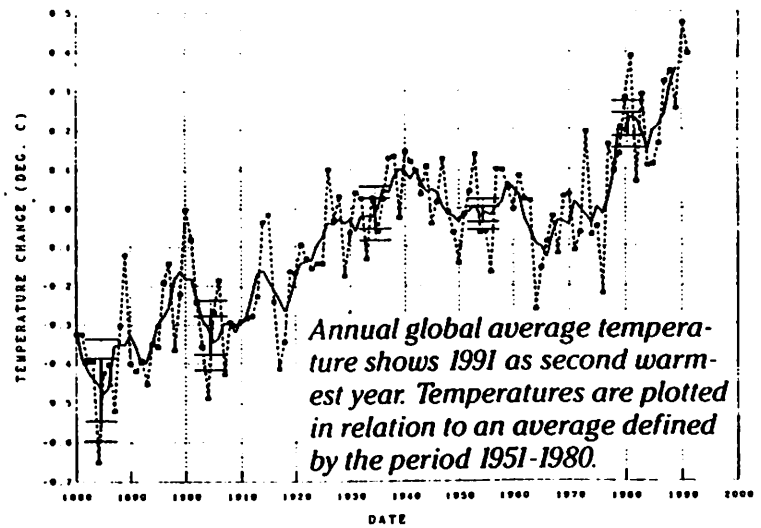
Pinatubo and El Niño fight tug of war

January is a month made for breaking New Year's vows and for assessing how the climate behaved over the previous year. According to analyses presented last week by two research teams, Earth's average temperature in 1991 ranks as the second highest on record, continuing a pattern of global warming that emerged during the 1980s.

"Although it is still too early to link the recent concentration of warm years with the influence of increasing greenhouse gases, international scientific opinion strongly supports the reality of the greenhouse effect, and it is likely that this has played some role in contributing to the recent warmth," concludes a group of climate researchers from the United Kingdom Meteorological Office in Bracknell and the University of East Anglia in Norwich.

The U.K. group analyzed both land and sea-surface temperatures measured around the globe, while a separate team from NASA's Goddard Institute for Space Studies in New York City focused on measurements from land stations.

The British researchers' analysis shows 1991 finishing 0.05°C cooler than 1990, which was the warmest year in their 140-year-long record. The NASA investigators found last year 0.08°C below 1990, which holds top position in their 111-year-long record.



Annual global average temperature shows 1991 as second warmest year. Temperatures are plotted in relation to an average defined by the period 1951-1980.

NASA

Balloon measurements taken in the lower atmosphere at 63 sites around the world also show 1991 as a warm year. In this 33-year-long record, 1991 qualifies as the fourth warmest, coming in close to 1988 and 1983, the second and third top years, says James K. Angell of the National Oceanic and Atmospheric Administration (NOAA) in Silver Spring, Md.

In all three data sets, 1991 started off very warm in comparison to other years, and then cooled in the second half of the year, in part, perhaps, because of the eruption of Mt. Pinatubo in the Philippines last May. After the eruption, researchers predicted that sulfur gases from the volcano would block out sunlight, cooling the climate for a few years (SN: 8/31/91, p.132). James Hansen of the Goddard Institute says the volcanic cooling should reach its maximum strength later this year and next year.

Global temperatures may not drop excessively in 1992, however, because an El Niño warming in the Pacific Ocean will mitigate the cooling, says Hansen. The El Niño has been growing in the equatorial Pacific since last summer (SN: 12/14/91, p.389), and NOAA scientists formally announced its existence this week.

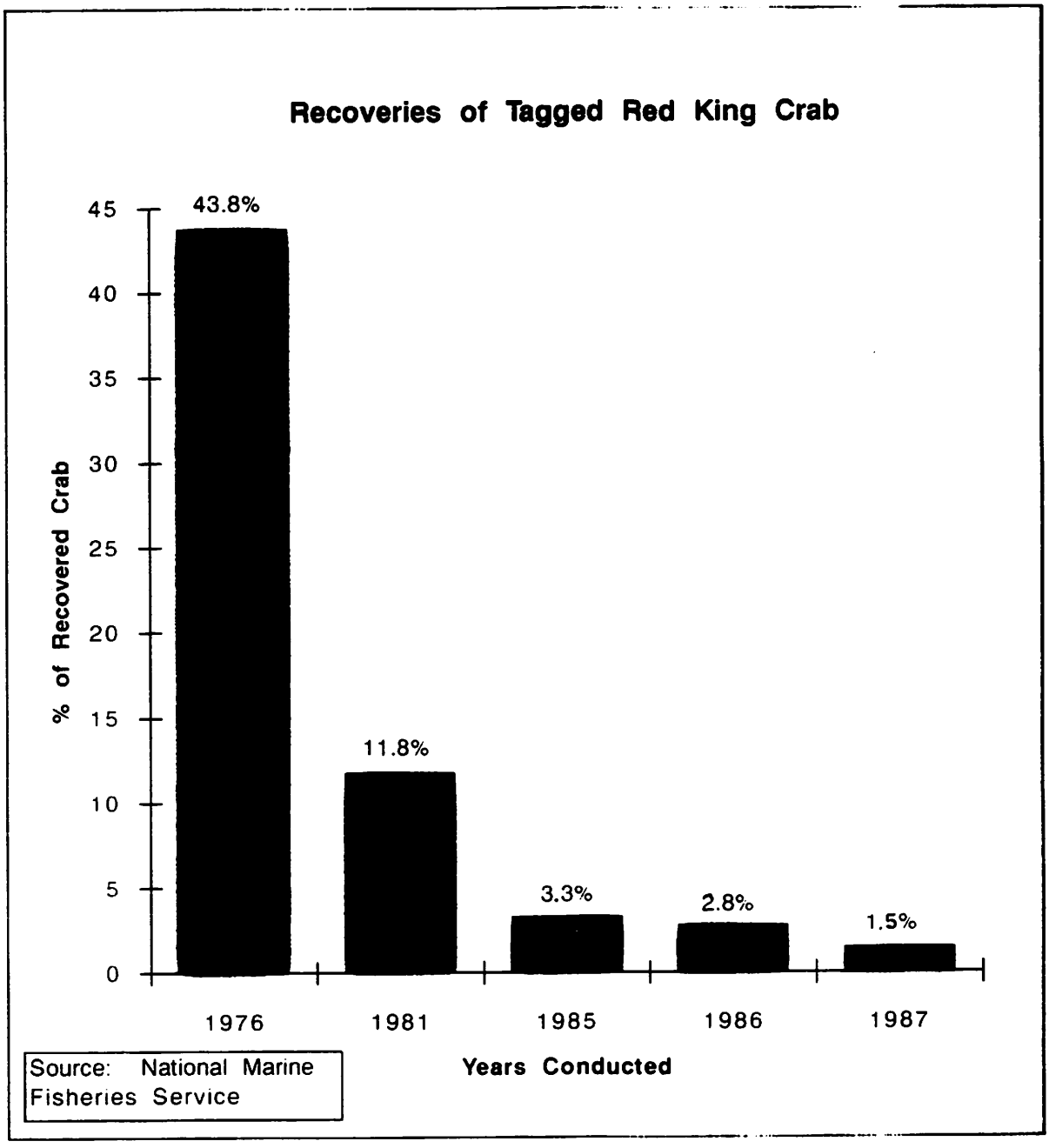
Caused by oscillations in the ocean and atmosphere, El Niño events push warm water from the West Pacific toward the East Pacific, raising temperatures across the ocean. In December, the patch of abnormally warm water had spread along the equator one-quarter of the way around the globe. The El Niño may intensify over the next few months, but should run its course by the end of the year, says Vernon E. Kousky of NOAA in Camp Springs, Md.

— R. Monastersky

Size at Maturity Versus Legal Size in Bairdi, Opilio, and Red King Crab Stocks in the Eastern Bering Sea

Species	Size at Maturity (Carapace Width)	Legal Size	Age at Maturity	Legal Age
Opilio*	60mm	78mm	4 years	5.5 years
Bairdi*	80mm	140mm	4.5 years	8 years
Red King Crab*#	104.5	165mm	5 years	8-9 years

Source: *Paul, A.J., and J.M. Paul
#Fukuhara, Francis M.


Recoveries of Tagged Red King Crab
% of Recovered Crab
45
40
35
30
25
20
15
10
5
0
43.8%
11.8%
3.3%
2.8%
1.5%
1976
1981
1985
1986
1987
Years Conducted
Source: National Marine Fisheries Service

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SUMMARY

TESTIMONY OF ARNI THOMSON, EXECUTIVE DIRECTOR, ALASKA CRAB COALITION BEFORE THE NORTH PACIFIC FISHERY MANAGEMENT COUNCIL, KODIAK, ALASKA, JUNE 21, 1993

Mr. Chairman and members of the NPFMC, I am here today to speak on the subject of Bering Sea/Aleutian Islands crab fisheries management. Management of the king and tanner crab species in this area is classified as interjurisdictional, under a federal fisheries management plan (FMP), which delegates certain day-to-day management to the State of Alaska. However, with the exception of the actual landings, these fisheries occur almost entirely in the Exclusive Economic Zone, (EEZ) from three to 200 miles offshore.

As the public comments, industry petitions and Congressional letters contained in the administrative record indicate, the shellfish fisheries, particularly, the Bering Sea crab fisheries, (1992 U.S. export value, $350 million: U.S. Dept. of Agric.) rank amongst the most valuable and the most controversial interjurisdictional fisheries in the United States.

The history of State of Alaska management of EEZ king and tanner crab fisheries is replete with controversies over allocative management actions which have been regarded as violative of the Constitutional rights of non-Alaskan U.S. citizens, particularly from the State of Washington. It is within the context of these controversies, I make my comments today. I note at the outset that there have been two federal appeals in the last calendar year, one a successful challenge to pot (or trap) gear limits, and the other a pending challenge of State authority to impose superexclusive registration areas.

The administrative record surrounding the twenty years of controversy is summarized in a letter from Mr. Clarence Pautzke to Mr. Steve Pennoyer. That letter, dated June 17, 1993, was prepared for the NPFMC Crab Interim Action Committee meeting of June 18, 1993, to review the State of Alaska decison on a "superexclusive registration area" for Norton Sound.

A revised Bering Sea/Aleutian Islands King and Tanner Crab Fishery Management Plan, which took three years to develop, was approved in 1989. In response to industry complaints, the plan attempted to redefine jurisdictional authority between the State of Alaska and the federal government. Unfortunately, it remains a fact today that today the State is overreaching its management authority in some areas, while at the same time, is not fulfilling its proper and essential research and conservation responsibilities.

I. History of ACC support for State of Alaska management under a federal oversight fisheries management plan.

1. In 1985-86, development of Bering Sea EEZ flatfish fisheries threatened king and tanner crab stocks.

2. ACC sought help from State of Alaska on bycatch problems with the developing bottomfish fisheries and with conservation and stock rebuilding in the directed king crab fisheries.

3. ACC proposed joint State, federal, and industry cooperation on research and management during and after the development of the Bering Sea/Aleutian Islands King and Tanner Crab FMP, 1987-1990.

II. Description of crab management problems with the State of Alaska.

1. Criticisms are focused on the State system, which is overwhelmingly concerned with managmement of salmon fisheries.

2. Recent problems with the Alaska Board of Fisheries actions regarding consistency with the Crab FMP and the MFCMA.

a. Repeal of the pot gear limits in 1992.

b. 1993 designation of the Norton Sound "superexclusive registration area" which is inconsis- with the FMP and is, therefore, illegal. Only exclusive and non-exclusive areas were included in the final FMP.

1). Industry associations vehemently opposed superexclusive designation in the formulation of the FMP, 1986 - 1989. (Administrative record, NPFMC.)

2). ACC appeal has requested expedited federal review from NMFS and Crab Interim Action Committee, and Federal Court.

3). Board of Fisheries changed season opening date from August 1 to July 1, without proper notice or record.

c. Board members are lay persons. Although most have good intentions, these individuals have little-to-no experience with crab management and EEZ fisheries. They also have an apparent objective to make decisions for the benefit of the State of Alaska.

III. Description of management problems with the Alaska Dept. of Fish and Game.

1. Regional autonomy system within ADF&G has resulted in Kodiak Westward Office being in charge of Bering Sea crab management. Reduced cooperation with industry has been a serious problem.

   a. Refused ACC good faith offers for developing long term industry-funded applied research on life history and mortality issues, after completion of a successful project in 1990.

   b. Refused ACC assistance with implementation of voluntary logbook program to aid in biomass estimates.

   c. Discontinued an ACC led voluntary catch reporting program that encouraged an orderly fishery and aided in-season management.

2. Kodiak Office has been ineffective and counterproductive.

   a. Kodiak Island and Bering Sea pot limits imposed to facilitate orderly fisheries.

   b. Total collapse of Kodiak EEZ tanner crab, since State of Alaska assumed management after 1987. However, pot limits were ostensibly implemented for conservation.

   c. Bristol Bay king crab fishery, 11 years after the collapse, still at record low depressed stock levels.

   d. Little-to-no new applied research on mortality problems, early life history.

   e. Reluctant lowering of a record snow crab quota for 1992, after pressure from the ACC, despite declining stock forecasts.

   f. Recent opening of scallop dredging in the Bering Sea, with no crab bycatch restrictions and no observer coverage.

3. The State has taken in much more from the fisheries than it has put into them.

   a. State of Alaska has been collecting over $15 million in raw fish and fuel taxes and permit fees from Bering Sea crab fisheries per year, in the last 3 years.

b. Industry-funded observer program has been paying $2.5 million for observers producing in-season catch and bycatch data.

c. State of Alaska has only been investing approximately $1 million in crab management, (excluding resource-based self-funding crab surveys), a part of the State's massive budget reduction for fish and game resource management that could jeopardize long-term sustainable use.

d. ACC recognizes that ADF&G has exceptional staff persons in Juneau, dealing with the interjurisdictional fisheries, Mr. Carl Rosier, Ken Griffin, Dr. Gordon Kruse, Earl Krygier, David Benton, and the new Commercial Fisheries Director, Dr. Jeff Koenigs.

e. Need for reorganization of Bering Sea crab management with direct line of authority between Juneau Headquarters, NMFS Alaska Region and the NPFMC in Anchorage.

IV. Problems with the State of Alaska Crab Observer program.

1. Alaska Crab Coalition and the Pacific Northwest Crab Industry Advisory Committee have requested a review of recent changes to the Crab Observer Program by the NPFMC Observer Oversight Committee

2. Alaska Dept. of Fish & Game is refusing to submit the program to timely review before the NPFMC.

3. The Board of Fisheries has recently made substantial changes to the program, that raise questions of consistency with the FMP, MFCMA, and the Council-approved future observer program.

4. The Crab FMP and the Council-approved North Pacific Fisheries Research Plan call for coordinated devel- of the crab observer program with the future federal observer program.

5. The State of Alaska is ignoring the intent of the FMP and the North Pacific Fisheries Research Plan.

6. Examples of problem areas in the Crab Observer Program are cited below from "ADF&G Observer Manual for Alaskan Crab Processors", Edition: February 1993.

a. Page 2, observers have access to inspect not only catch, but also equipment, gear, and operations of vessels.

b. Page 17, para 1; unacceptable language concerning confidentiality of observer information.

c. Page 12, State has discretionary authority on final certification.

d. A long standing requirement that catcher processors transporting processed product to a non Alaskan port, must carry an onboard observer to the destination.

RECOMMENDATIONS FOR IMPROVING CRAB FISHERIES MANAGEMENT IN THE EEZ OF THE BERING SEA/ALEUTIAN ISLANDS:

The ACC recommends that the NPFMC initiate Crab FMP amendments to cover major allocative issues and the Crab Observer Program.

The ACC recommends that management measures regarding pot limits, trip limits, vessel size classes, registration areas and fishing seasons be placed in category one, subject to change only by plan amemdment within the NPFMC.

These measures, under the jurisdiction of the Board of Fisheries are starting to preempt the comprehensive rationalization process (limited access, which is a management function reserved to the jurisdiction of the NPFMC). Further use of such measures by the State will severely alter catch histories of the crab fleet and impact the allocation scheme to the disadvantage of the larger non resident boats.

The ACC also recommends that the State Observer Program be moved into Category One of the FMP and that the NPFMC take the necessary steps to assimilate the crab observer program into a federal observer program.

SUMMARY

TESTIMONY OF MR. RICHARD C. WHITE, CHAIRMAN OF THE PACIFIC NORTHWEST CRAB INDUSTRY ADVISORY COMMITTEE TO THE NORTH PACIFIC FISHERY MANAGEMENT COUNCIL, KODIAK, ALASKA, JUNE 21, 1993

Mr. Chairman and members of the NPFMC, my name is Rich White. I am here today as Chairman of the Pacific Northwest Crab Industry Advisory Committee.

The Pacific Northwest Crab Industry Advisory Committee is authorized under the Bering Sea/Aleutian Islands King and Tanner Crab Fishery Management Plan (FMP), approved by the Secretary of Commerce in May of 1989. The Committee held its first meeting in January of 1990. It is sanctioned by, and operates under the auspices of the NPFMC, and it is recognized by the State of Alaska as having the same consultative role as other existing State of Alaska Fish and Game Advisory Committees. However the PNCIAC is restricted to discussion of matters relating to only crab management in the Bering Sea/Aleutian Islands area.

A growing frustration has developed within the committee regarding its effectiveness and its ability to make timely decisions given the information, or lack therof, as requested.

I would like to provide a few examples. In March of 1992, the Alaska Board of Fisheries approved a regulation imposing a 250 pot limit on the number of pots fishermen could use in the Bering Sea/Aleutian Islands area. The Secretary of Commerce ruled the decision to be discriminatory and in December of 1992, the decision was

repealed.

Sometime in December of 1992, I received a phone call from Clarence Pautzke, Executive Director of the NPFMC, requesting that the Committee develop a recommendation for the Board of Fisheries on the pot limit that would meet the FMP criteria and that would pass muster on the discriminatory aspects of the issue. The Board of Fisheries was scheduled to meet February 2, 1993. I told Mr. Pautzke that the committee would comply with his request as I had scheduled a meeting of the committee for January 5th, 1993. The committee had held a meeting on December 2, 1992 and on the following day, we sent a memorandum to the Alaska Dept. of Fish and Game office in Kodiak requesting specific information and advice on pot limits, the crab observer program, superexclusive registration areas and other matters. None was forthcoming.

During the committee's January meeting, ADF&G personnel were present, but they were unable to present any helpful data on pot limits, such as vessel sizes, comparative catch histories, or any solutions that they felt would pass legal review within the Dept. of Commerce. The only comments that were made, very clearly, were that a pot limit was necessary for them to adequately manage what was termed "a power" fishery.

In spite of the limited information provided by the ADF&G staff, the committee developed a proposal that would assign crab pot limits to vessels relative to their overall length. Thus, on January 13th a memorandum was sent to Mr.

Pautzke defining this proposal and also expressing the committee's frustration over this matter. The proposal was also submitted to the Board of Fisheries.

Although I was unable to attend the Board of Fisheries meeting in February of 1993, it was reported to me that the committee's pot limit proposal received only cursory attention at best, and that ADF&G management personnel presented information to the Board of Fisheries, of the precise nature that we had requested for our January 3rd meeting. This information would have greatly assisted the committee in developing its pot limit proposal.

Of further concern to the Committee is the ADF&G Crab Observer Program. The Board of Fisheries, in cooperation with ADF&G made extensive changes and revisions to the program regulations at the February Board of Fisheries meeting. Numerous questions have arisen relative to consistency of the changes with the Crab FMP, the MFCMA and the Council approved Fishery Research Plan (future observer program). Although this program is separate from the Research Plan, the Plan contains a directive for the crab program to be coordinated with the Research Plan. We suspect that is not being done,--and further, we request that the Council convene a meeting of the Observer Oversight Committee for the express purpose of reviewing the revised Crab Observer Manual regulations.

The last point I wish to make is to draw attention to the apparent deterioration in communication and dialogue

between ADF&G and NMFS. We feel an improvement is needed in the inseason exchange of information, in order to more effectively manage the stocks and the fisheries. Our committee sits in a unique position, as an advisory group to both the Council and the Board of Fisheries, to make these observations and we feel very strongly that vast improvements can be made.

Thank you for the opportunity to comment on these matters.