MEMORANDUM

TO: Council, SSC and AP Members

FROM: Clarence G. Pautzke
Executive Director

DATE: August 30, 2000

SUBJECT: Steller Sea Lions

ESTIMATED TIME
16 HOURS

ACTION REQUIRED

Initial review of an analysis of the Pacific cod fisheries and reasonable alternatives to minimize possible competitive interactions with the endangered western population of Steller sea lions.

BACKGROUND

There are three major items which incorporate Steller sea lion conservation issues: the Supplemental Environmental Impact Statement (SEIS), the plan level Biological Opinion, and the initial draft Environmental Assessment of alternatives for the Pacific cod fisheries.

SEIS

On July 8, 1999, U.S. District Court issued two rulings. First, the 1998 biological opinion and the reasonable and prudent alternatives (RPAs) developed therein to mitigate interactions between Steller sea lions and the pollock fisheries were arbitrary and capricious for lack of sufficient explanation. Second, the court found that the 1998 SEIS was too narrow in scope and that a more programmatic (i.e., plan level) EIS was needed. NMFS staff, with assistance from others including Council staff, are preparing a revised SEIS. A complete draft is scheduled to be available for review by October 20 and a notice of availability will be published in the Federal Register on October 27.

Biological Opinion

On January 25, 2000, the Court ruled that the biological opinion for the 1999 BSAI and GOA Groundfish TAC specifications was arbitrary and capricious as it failed to conduct a sufficiently comprehensive examination of the overall effects of the groundfish fisheries on listed species and designated critical habitat. On July 19, the Court ruled that it would enjoin all groundfish trawl fishing in Steller sea lion critical habitat in the BSAI and GOA beginning on August 8. The injunction remains in effect until further order of the Court. Presumably, the injunction would be lifted when the Court deems that a sufficient plan level biological opinion has been prepared and that management measures are adequate to avoid jeopardy or adverse modification of critical habitat for all listed species. At this meeting, the Council will be considering additional measures to alleviate possible competitive interactions between the Pacific cod fisheries and Steller sea lions. Any additional management measures, if adopted, would be incorporated into the biological opinion under the status quo for 2001.

Pacific Cod – Steller sea lion analysis

At the June meeting, NMFS staff provided the Council with a discussion paper on potential interactions between Steller sea lions and the GOA and BSAI Pacific cod fisheries. The Council and its Advisory Panel requested that additional information be added to the analysis, including the effects of previous management actions such as the pollock trawl closures, the midwater pollock trawl restriction, and the effects of the American Fisheries Act. NMFS held public meetings (June 27 in Kodiak and June 29 in Seattle) to develop reasonable alternatives for the Pacific cod fishery that would reduce the likelihood of competitive interactions with Steller sea lions. At this meeting, NMFS will present the analysis for initial review. Final action is scheduled for October, with implementation of the preferred alternative by emergency rule prior to January 1, 2001.

Note that several sentences were left off the draft on page 45 of the analysis. The corrected text is attached, followed by comment letters we have received on this issue.

Subject: P. cod EA info on State fishery
Date: Mon, 28 Aug 2000 11:49:19 -0800
From: "Shane Capron" <Shane.Capron@noaa.gov>
Organization: NOAA Fisheries
To: Gail Bendixen <Gail.Bendixen@noaa.gov>, becharof@alaska.net

Correction to page 45 of the cod EA: the paragraph should read as follows, the last few sentances were left off the draft. I have had a few calls on this, if you get any please pass this information along. Thanks

3.1.4.2.3 State Managed Pacific Cod Fishery

The federal Pacific cod TACs in the GOA are affected by a developing Pacific cod fishery in state waters. Since the beginning of a separately managed Pacific cod fishery by the State of Alaska in 1997, the federally managed TACs have been adjusted downward from ABC levels by the amount of guideline harvest levels (GHLs) established by the State. In recent years about 20 % of the annual TACs have been held in reserve until after the principal directed fisheries close as a management buffer to prevent exceeding the annual TACs. In 1999, in effect, the State was allocated 16,565 mt of Pacific cod by the Council (the Federal TAC was adjusted downward by this amount from the ABC; see 1999 Final GOA harvest specifications), and harvested just over 13,000 mt.

NEWS RELEASE

ALASKA DEPARTMENT OF FISH & GAME

STATE OF ALASKA
Department of Fish and Game
Frank Rue, Commissioner

Doug Mecum
Director

Contact: Earl Krygier
Extended Jurisdiction Coordinator
(907) 267-2111

FOR IMMEDIATE RELEASE

August 8, 2000

Notice to all groundfish fishermen utilizing trawl gear in state waters:

Federal waters closed today at 11:00 AM to all groundfish trawling in Steller Sea Lion Critical Habitat Areas pursuant to inseason federal restrictions resulting from a court order in ongoing litigation against the federal government [See NMFS information Bulletin #00-72, August 8, 2000 and Critical Habitat as defined at 50 CFR 226.202. These may be viewed at www.fakr.noaa.gov].

Therefore, pursuant to Alaska Department of Fish and Game Emergency Order No. 4-GF-01-00 for the Kodiak, Chignik, South Alaska Peninsula, Bering Sea-Aleutian Islands and Chukchi-Beaufort Areas and Emergency Order 2-GF-H-01-00 Cook Inlet and Prince William Sound Areas, effective 11:00 AM August 8, 2000, fishing with trawl gear in state waters encompassed by these Steller Sea Lion Critical Habitat Areas is also prohibited.

This notification is a reminder that when federal waters of the EEZ close to groundfish fishing through inseason adjustment, adjacent state waters generally close as well. Fishermen are advised to carefully follow federal announcements on closure of sea lion critical habitat areas and recognize that the State emergency orders cited above have a parallel effect for groundfish trawling in adjacent state waters.

For information in the Westward Region contact: Wayne Donaldson
907-486-1842

For information regarding Cook Inlet and Prince William Sound contact: Charles Trowbridge
907-235-8191

David Hillstrand
Box 1500
Homer, Alaska 99603

Stellar Sea Lion

There are many issues and topics that will be explored and talked about concerning the Stellar Sea Lion.

Removal of Pacific Cod near rockery areas.

a. What percentage of the quota is taken in the 0-3-mile area?
b. What percentage of the quota is taken in the 3-20-mile area?
c. What percentage of the quota is taken beyond 20-miles?
d. What fish will P. Cod eat if not taken out of these areas? Herring, Salmon, Pollok, King and Tanner crab?
e. How will this affect the SSL?

The effect of pots, H&L and Jig gear.

a. What percentage of the quota do these gear types take from the 0-3 mile area?
b. What percentage of the quota do these gear types take from the 3-20mile areas?
c. What affect do these gear types have on the habitat?
d. Do these gear types school the fish up and make it easier for SSL to feed in those areas where P cod are fished?
e. What areas does most of the fishing occur in the 0-3 mile area? Without any occurring in the 3-20-mile area and 20 miles and beyond.
f. What areas does most of the fishing occur in the 3-20 mile area? Without any occurring in the 20-mile area and beyond.
g. What affect will that have on extracting the full quota out of the 20-mile area and beyond have?
h. Does bait, herring, squid and sardines from these fisheries feed SSL?

Should exploitation rates be reduced?

a. Will this leave more P. Cod for SSL?
b. Will this reduce fishing time and contact with SSL?
c. Can there be separate quotas for 0-3 miles, 3 to 20 miles, and 20 miles and beyond?
d. Can timed openings help with different areas?

Please consider carefully the permanent closure of all gear types for P. Cod. Look at each area separately and each rookery individually.

There are questions to be asked, and several things the NPFMC can accomplish!

1. Is the exploitation rate too high for Pacific Cod? **Then reduce it!**

a. Is the percentage of the quota that is taken from 0-3 mile area too great? Does it need to be spread out into the 3-20 mile area? Or does it need to be spread out 20 miles and beyond? **Than spread it out!**

2. Can eliminating trawling of Pacific Cod reduce bycatch and habitat destruction?

a. If so than allow for the removal of Pacific Cod with Pots and H&L and Jigs in the 3-20 mile area. Still allowing those who trawl to participate with a different gear type

b. Some species will be impossible to fish any other way than with trawl gear. The question to ask is "Are the exploitation rates too great for those fisheries?"

Hello America,

I am forced to write this opinion down and send it out to ya. My goal is to try and point out what I believe is the goal of this environmental alliance between Greenpeace, American Oceans Campaign, and the Sierra Club. They hate trawling and the sea lion is a way to attack trawlers. They were hanging off bridges before they realized the court system would be more effective. (Viola, the Sea Lion) What we have is a carefully nurtured public perception of trawlers being vile nasty evil machines killing off everything in their paths. This incorrect perception is one group's opinion, not fact!

Following the logic in Judge Zilly's decision of July 20, the plaintiffs could just as easily have made the case that the contrails of an airliner at 30,000 ft. disturb the mating urges and prohibited flights over Alaska's coast. The plaintiffs' expert, Dr. Lavigne, states that the presence of fishing vessels in sea lion habitat increases disturbance effects on sea lions and prey species. Has he ever seen a sealion jump on a fishing vessel grab a fish, eat it, then jump back off? I have, numerous times. Didn't look disturbed to me! Lets think about Hershel for a second, (Lets see, in a Lock, Boats, Trucks, Trains going by) EVERY conceivable method, including relocation, was attempted to stop his Steelhead foraging.

Ground fish stocks are at an all time high. Greenpeace screams " Sea lions are declining!" The newest surveys seem to indicate stabilization in the sea lion population. Scientists will tell you that sea otters have declined by 80%, directly attributed to killer whales! An Orca was found to have 9 sealion tags in its belly. How many untagged ones did this one whale eat to get 9 tags, at one time? Whale populations are at an all time high, nature's reaction is to allow more predators to survive. You can witness pods of whales hunt down and narf groups of sealions from the docks in our town. Where'd Willy go, what's he eating? The environmentalists have sued to stop fishing within 20 miles of any sea lion rookery, in use or not. This represents a huge percentage of Alaska's coast. Approx. 178,000 sq. mi. (That's like Washington, Oregon, Some of Idaho, and a little of Northern California) their story is that the sea lions are starving .Yea, right, B.S. The removal of fishing effort, according to the 9th circuit court's decision paper, will (Assuming prior harvest levels

and 30,000 sea lions) save 150 lbs./day for the sea lions. Now for those of you who don't understand fishing, the fishing quotas are set at approximately 10% of the available biomass. That leaves 1500lbs/day per sea lion. If a sea lion can eat 50 lbs/day after 10 days that leaves 14,500 untouched. After 100 days there will be 145,000 left (per sea lion x 30,000) with no possible way a sea lion could eat that much. O.K. That's a lot of food. That's just Pollock, there are many other species of fish getting taken from the nation's economy (you want to talk about trade imbalance, the other fish-producing countries of the world must be rooting Greenpeace on) and reserved for sea lions in these 20 mile exclusion zones. Countless thousands of tons of fish.

There are millions of starving people in this world. I'm glad that I don't have to explain to the Ethiopians why Greenpeace thinks a sea lion should get 1,500 lbs /day(remember that's just the Pollock ,they also want them to have Cod, Salmon, Herring, Smelt, and all Sole and Flounders in a 178,000 sq mi area.) while these PEOPLE ARE STARVING??? The biggest joke that I can see is an environmentalist with more than 2 children, driving a SUV to a "save the earth" meeting. I don't see buffalo covering the Great Plains. Is anybody bummed at this? We know they covered the plains 150 yrs ago. How about the Manatee? Can't stop the Florida sport boat industry (prop strikes are their biggest killer). Why target the country's largest supply of food. Do you want to be left to choose between Mad Cow and Tofu?

Do the math, figure the #`s, think for yourself instead of their deceptive propaganda, and you might also think Judge Zilly`s decision arbitrary and capriccios. That's my opinion. I live here; I have spent my whole life here. The last thing I want is to destroy the ecosystem or damage the environment. There are videos that show trawl behavior on the ocean floor. Please take the time to watch them. I tow a net made of twine ½ the size of your shoelace. Do your footprints destroy a beach?" Think" that's all I can ask. This is not New England. We have sustainable harvest levels on a renewable resource.

I am a 3rd generation fisherman. I do not want to hurt the ecosystem. It has supported my family and myself for the last 35 years.

Thank you,

Scot Gilliland
Kodiak, Alaska

BLUE NORTH
FISHERIES

4502 14th Avenue NW • Seattle, WA 98107 • (206) 782-3609 • Fax (206) 782-3242
Tollfree 1-877-TRUECOD • email: bluenorth@uswest.net

August 29, 2000

<< Public Comment >>

RECEIVED
AUG 29 2000
N.P.F.M.C

Mr. Richard Lauber
North Pacific Fisheries Management Council
605 West Fourth Avenue, Suite 306
Anchorage, Alaska
<< VIA FACSIMILE >>
(907) 271-2817

To Mr. Lauber and the Members of the Council:

This letter is in regards to concerns for potential competition between Pacific Cod Fisheries and Steller Sea Lions.

If it is considered a foregone conclusion that "food stress" and "localized depletion" of fish stocks are responsible for Steller Sea Lions' lack of recovery, (and Judge Zilly seems to agree that it is,) then this is a gear problem, not a fishery problem. Figure 2 of the Protected Resources' Discussion Paper and Figure 15 of the Draft Environmental Assessment (both attached) demonstrate this point clearly.

If the solution to avoiding "food stress" and "localized depletion" is to spread directed cod fishing out through both time and area, then the longline fleet demonstrates the ideal for this goal. Longliners catch their fish one at a time, not by the bagfull. Unlike the congregated trawlers, they are spread throughout the grounds by their very nature - that's where the "long" in longline comes from. By careful awareness of other environmental concerns such as seabird avoidance and minimizing halibut bycatch, the freezer-longline fleet has achieved a fishery spread throughout the calendar year, rather than a "pulse" fishery in winter months. For avoidance of competition with Steller Sea Lions, the freezer-longline fleet demonstrates a standard to be met by other gear types.

In respect of NMFS' twin goals of maximizing Sustainable Fisheries and protecting Protected Resources, I submit that any changes to the "Status Quo" be made on a gear-specific level, with the goals for spatial and temporal distribution clearly stated and adhered to. What is "Status Quo" for one gear type is much different than "Status Quo" for another, any pretense otherwise is a sham. Industry gear groups that have cultivated and demonstrated conservative fishing methods should not be penalized for defects of competing industry gear groups.

On behalf of myself, my company, and the fellow fisherman who, like myself, share a concern for the environment and all its occupants, I beseech the Council to excercise common sense and make the trawlers pay for their indiscriminate and rapacious take of the resources that us little guys, longliners and Steller Sea Lions alike, rely upon for our very existence.

Sincerely,

Mike Burns
President, Blue North Fisheries
F/V Blue North, F/V Blue Pacific

Appendix 1 - Additional Tables and Figures

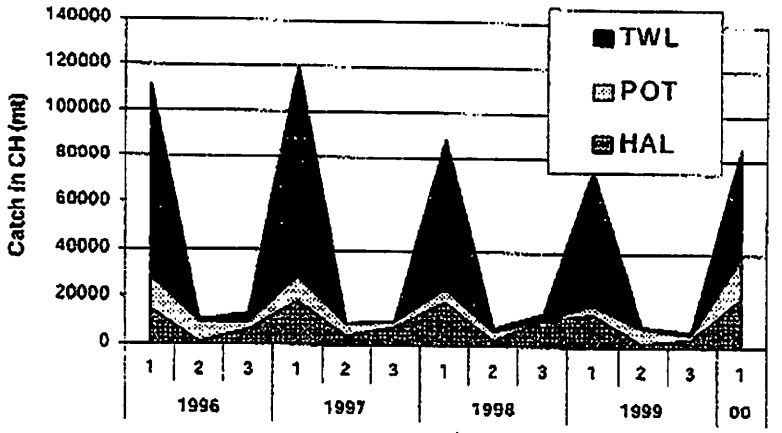


Figure 1. BSAI catch of Pacific cod inside critical habitat by season and by gear type from 1996-2000.

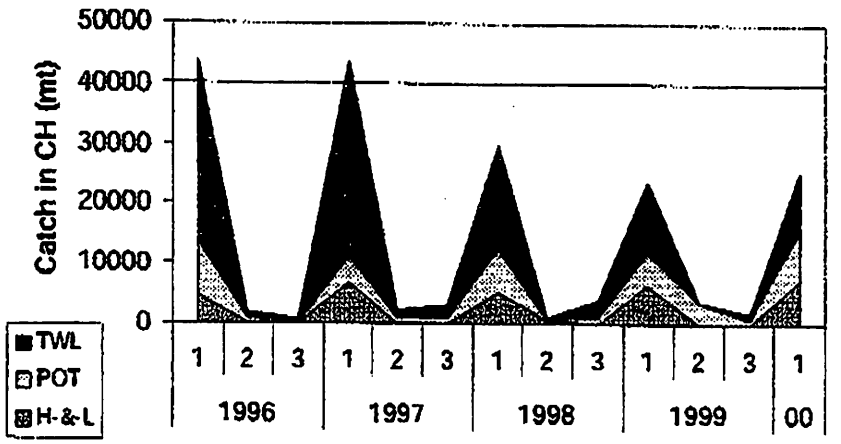
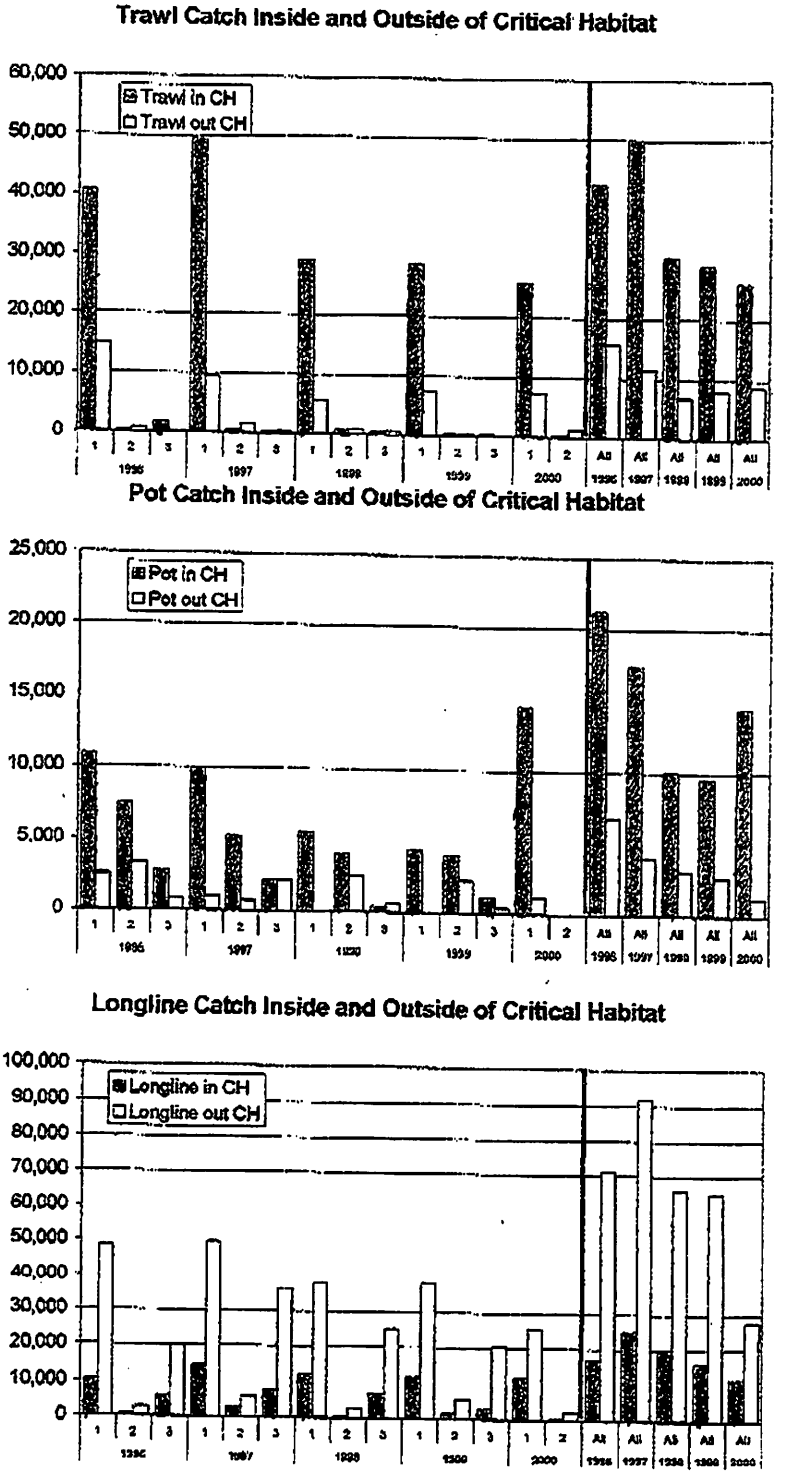


Figure 2. GOA catch of Pacific cod inside critical habitat by season and by gear type from 1996-2000.

Figure 15. Bering Sea catch of Pacific cod inside and outside of critical habitat by season and by gear type from 1996-2000.



Kodiak Electric Association Inc.

(907) 486-7700

Box 787
KODIAK, ALASKA 99615

August 29, 2000

North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, AK 99501

Sent Via Fax: (907) 271-2817 and U.S. Mail

Re: Steller Sea Lion Measures

At their regular meeting of August 23, 2000, the Board of Directors of Kodiak Electric Association, Inc. unanimously passed two companion resolutions regarding the recent court-ordered closure of ground fishing and its effect on our local economy. As you are well aware, commercial fishing is the backbone of our economy on Kodiak Island, and our residents depend on fishing dollars. The ban on trawl fishing around Kodiak Island waters will have a tremendous negative impact on this community's ability to provide jobs to the more than 4,000 people currently employed in the fishing industry. I have enclosed copies of Resolutions 521-00 and 522-00 for your reference.

The KEA Board of Directors has sent copies of these resolutions to our U.S. Congressional delegation requesting their assistance to:

1. Confirm the commitment of NMFS to complete an adequate fishery management biological opinion by October 31, 2000 and to utilize whatever resources are required to meet the stated date of completion.

2. Do all that is in their power to move the appropriate personnel of the Marine Mammal Section of the Marine Mammal Section of the Alaska Fisheries Science Center from Seattle, Washington to Kodiak, Alaska and more fully utilize the Kodiak Fisheries Research Center, the Seward Sea Life Center, and the University of Alaska.

3. Do all that is in their power to stimulate and encourage proactive efforts on the part of the National Marine Fisheries Service in regard to research on populations approaching threatened or endangered status in the North Pacific and Alaskan Waters.

4. Do all that is in their power to facilitate the timely appointment of the North Pacific Research Board and move to set up research funding opportunities, targeted to the needs of coastal communities, from the North Pacific Marine Research Fund as soon as possible.

Please feel free to make this letter available to your legislative colleagues and any agency official you deem appropriate and necessary in meeting our mutual goal. Please contact me at (907) 486-7700 if you should have any questions.

Sincerely,

Darron Scott
General Manager

DS:nbs
Enclosures (2)

KODIAK ELECTRIC ASSOCIATION, INC.

KODIAK, ALASKA

RESOLUTION

521-00

REQUESTING THE NATIONAL MARINE FISHERIES SERVICE TO COMPLETE AN ADEQUATE FISHERY MANAGEMENT BIOLOGICAL OPINION ON OR BEFORE OCTOBER 31, 2000

WHEREAS, the U.S. Department of Justice has decided not to appeal the decision by U.S. District Court Judge Thomas Zilly of Seattle on July 20, 2000 to halt all groundfish fishing within 20 miles of Steller sea lion rookeries and haulouts beginning on August 8, 2000, while the National Marine Fisheries Service (NMFS) develops new analysis and recommendations; and

WHEREAS, the NMFS analysis and recommendations for fish species and marine mammals are due October 31, 2000; and

WHEREAS, the bulk of the commercial species reside within 20 nautical miles of shore in the Gulf of Alaska, which coincides with the area closed to trawling by the U.S. District Court in Seattle; and,

WHEREAS, residents of Kodiak Island and Gulf fishermen may be deprived of substantial income and fishermen may not be able to safely fish outside the 20 mile closure; and,

WHEREAS, the inability of small-boat fishermen to trawl fish will dramatically reduce the amount of fish available to Alaskan shore-based processors; and

WHEREAS, the seafood processing industry in Kodiak alone comprises almost 30 percent of Kodiak Electric Association's annual sales revenue; and

WHEREAS, the loss of groundfish processed by Kodiak shore-based operations will reduce the electrical energy used by the community; and

WHEREAS, the loss of electrical energy sold due to a reduction in seafood processing could lead to a loss of customers and rate increases to the cooperative members;

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of Kodiak Electric Association, Inc. of Kodiak Alaska calls upon the U.S. Congressional Delegation and the Governor of the State of Alaska to confirm the commitment of NMFS to complete an adequate fishery management biological opinion by October 31, 2000; and

FURTHER BE IT RESOLVED, that the Board of Directors of Kodiak Electric Association, Inc. requests that the NMFS utilize whatever resources are required to meet the stated date of completion.

CERTIFICATION

I, **Kathleen Ballenger** do hereby certify that I am **elected** Secretary of Kodiak Electric Association, Inc., an electrical non-profit cooperative membership corporation organized and existing under laws of the State of Alaska; that the foregoing is a complete and correct copy adopted at a meeting of the Board of Directors of this corporation, duly and properly called and held on the **twenty-third day of August, 2000**; that a quorum was present at the meeting; that the resolution is set forth in the minutes of the meeting and has not been rescinded or modified.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed the seal of this corporation this **twenty-third day of August, 2000.**

(Seal)

Secretary Kathleen Ballenger

KODIAK ELECTRIC ASSOCIATION, INC.

KODIAK, ALASKA

RESOLUTION

522-00

REQUESTING THE MOVEMENT OF THE MARINE MAMMAL SECTION OF THE ALASKA FISHERIES SCIENCE CENTER FROM SEATTLE, WASHINGTON, TO KODIAK, ALASKA; REQUESTING THE NATIONAL MARINE FISHERIES SERVICE BE PROACTIVE IN REGARD TO SPECIES APPROACHING THREATENED STATUS IN THE NORTH PACIFIC AND ALASKAN WATERS; AND REQUESTING THE NORTH PACIFIC RESEARCH BOARD BE APPOINTED AND START FUNCTIONING AS SOON AS POSSIBLE.

WHEREAS, the Kodiak community recognizes the ecological and economic importance of living marine resources surrounding Kodiak and Alaska; and

WHEREAS, the Kodiak community is keenly aware of the endangered status of the Stellar Sea Lion and the urgent need to scientifically understand why populations West of 144 degrees longitude have become endangered; and

WHEREAS, the critical habitat for the Stellar Sea Lion includes the Western Gulf and Bering Sea and not Seattle, Washington; and,

WHEREAS, populations of other species including birds, mammals, and fish in the Bering Sea, North Pacific, and Alaskan waters may approach endangered status from time to time; and,

WHEREAS, the continued sustainability of fishery resources depends on timely and focused marine research; and

WHEREAS, it is crucial that in order to be most effective the research be done as close to the affected critical habitats as possible;

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of Kodiak Electric Association, Inc. of Kodiak Alaska requests the following:

Section 1. That the U.S. Congressional Delegation does all in its power to move the appropriate personnel of the Marine Mammal Section of the Alaska Fisheries Science Center from Seattle, Washington to Kodiak, Alaska and more fully utilize the Kodiak Fisheries Research Center, the Seward Sea Life Center, and the University of Alaska.

Section 2. That the U.S. Congressional Delegation does all in its power to stimulate and encourage proactive efforts on the part of the National Marine Fisheries Service in regard to research on populations approaching threatened or endangered status in the North Pacific and Alaskan Waters.

Section 3. That the U.S. Congressional Delegation does all in its power to facilitate the timely appointment of the North Pacific Research Board and move to set up research funding opportunities, targeted to the needs of coastal communities, from the North Pacific Marine Research Fund as soon as possible.

CERTIFICATION

I, **Kathleen Ballenger** do hereby certify that I am **elected** Secretary of Kodiak Electric Association, Inc., an electrical non-profit cooperative membership corporation organized and existing under laws of the State of Alaska; that the foregoing is a complete and correct copy adopted at a meeting of the Board of Directors of this corporation, duly and properly called and held on the **twenty-third day of August, 2000**; that a quorum was present at the meeting; that the resolution is set forth in the minutes of the meeting and has not been rescinded or modified.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed the seal of this corporation this **twenty-third day of August, 2000.**

(Seal)

Secretary Kathleen D Ballenger

F/V BLUE FIN
19829 168th St.SE.
Monroe, Wash. 98272
Ph.(360)863-8453 Fax. (360)863-1359

Att.Mr.Pultzky and North Pacific Management Counsel Date 8-24-00

My name is Kurt Vedoy, I own and operate the F/V BLUE FIN with my brother Oluf Vedoy. As I have stated before in previous letters I have a long history with good catch record of Codfish that is caught by Pots.I am qualified as a Catcher/Processor.

I know there is several meetings by the Counsel coming up before the end of year 2000. My issue with the Counsel is that I need the POT CATCHER/PROCESSORS and POT CATCHER boats SPLIT as two different groups because of the different interest and also because of a good catch history that I have worked hard to build.

The Counsel sided with the Longliners because of their long time catch history to be protected from the big additional participation by Crab boats. I AM ASKING THE COUNSEL TO PLEASE VOTE ON A SPLIT BETWEEN C/P and C/vessels as this action will protect my long term investment and my good catch records just as well as the Longliners.

We had a perfect example of how bad a situation this turned out to be,since we were not protected by a split, this year 2000. We ended up with hardly any fishing time which is devastating to our business which we already had established years ago along with a Cod plant in Wash.All fish was shipped through Dutch Harbor and paid taxes accordingly.

I NEED THE COUNSEL SUPPORT ON THIS issue IN ORDER TO SAVE AN ALREADY ESTABLISHED BUSINESS FROM GOING BAD.IT WOULD BE A BIG SHAME ON COUNSEL MANAGEMENT IF THAT HAPPENED WHEN THEY INDEED CAN SAVE THIS BY VOTING YES ON SPLIT OF POT C/P and C/vessels

Sincerely Kurt Vedoy

Kurt Vedoy

RECEIVED
AUG 29 2000
N.P.F.M.C

NPFMC SSC ---Dr Richard Marasco, Chair

I realize that there is a lack of clear data on the needs of the remaining sea lions of the Aleutians but in the years I have been involved it seems to me that the scientific explanations have been submerged by the emotional and political.
I'm therefore approaching, the SSC in the hopes we can start this back toward a logical scientifically based approach to the management of out living resources.
In many ways the future of the Steller Sea Lion looks brighter this year than it has since the decline began in the Western Gulf and the Aleutians.
I feel this is true in part to the reduction of the dependency of killer whales on the Western Steller Sea Lion population.
Some pods, no doubt, have migrated to areas of better prey abundance. Others are praying on different marine mammals such as sea otter, hair seal, and beluga whales, though, as an aside the killer whale perdition on belugas in Cook Inlet is down. I would be inclined to feel the red meat eating pods have migrated to the Eastern side of the Gulf to take advantage of the large increase among Steller Sea Lions and other pinipeds in South Eastern Alaska, British Columbia and points South.
I do not think it is a coincidence that the pinipeds and some sea birds have shown a marked decline in those areas where pollock and cod stocks are high. You can't support a healthy horse on straw instead of hay, or a healthy piniped on low oil content fish like cod and pollock. The need for high oil content fish on the order of needle fish, caplan and herring is essential to the mainentance of seal, sea lion and the broad sea bird population.
The Steller Sea Lion of the central and Western Aleutians are, I am sure, benefiting from the substantial increase of Atka Mackerel, though even this species, while much higher in oil than cod or pollock still lags well below caplan.
The Steller Sea Lion is not an endangered species but a healthy one, so unless all the Steller Sea Lion females of South Eastern Alaska having been having two pups a year common sense would point to the fact that immigration from the West to an area of better prey abundance played at least some part in this Eastern increase.

Clem Tillion

HIGH SEAS, INC.
PO BOX 61034 SANTA BARBARA, CA 93160
PH 805/692-9345 FAX 805/692-9147

August 23, 2000

North Pacific Fishery Management Council
605 West 4th Avenue Suite 306
Anchorage, AK. 99501-2252

RE: 2000 4th Quarter Pollock / Zilly Ruling

Dear Sirs:

With regard to the recent Court ruling pushing the trawl zone 20+ miles offshore, I am writing out of grave concern for the safety of the small boat trawl fleet for this upcoming 4th quarter pollock fishery.

My husband has a 58' limit seiner. He has been successfully trawling with it since 1989 because he has been able to trawl close enough to shore to duck in for bad weather. He would never, ever consider trawling 20+ miles offshore during either the 1st or 4th quarter openings because of weather and icing conditions. He's no fool. Last night though he told me had to go trawling in October because he needed to make a trawl landing in 2000 to stay current so as not to be penalized and/or cut out of any future Groundfish IFQ system. He pot fished cod and tendered salmon during the first three openings and was planning to trawl in October. However, the draconian ruling by Judge Zilly this summer will now put my husband and many other small boat operators in grave danger this fall if they venture out 20+ miles to trawl.

While the Council cannot control the Judge's ruling, I believe the Council does have in it's power to waive a 2000 trawl landing requirement for any future IFQ Groundfish qualification requirements. For the safety of your fellow fishermen and their families I believe it is your responsibility to either issue 2000 trawl landing waivers or rollover the 2000 landing requirement into 2001 to allow this fleet to safely fish offshore in the spring and summer when extreme weather and icing conditions are past.

Since this ruling came so late in the year many people are caught in this tough situation. With a clear conscience and the stroke of your pen you can help these fishermen make the safe choice to not fish 20 miles offshore this fall & winter where they don't belong. It is in your power to alleviate this 4th quarter problem. I pray you will do the right thing.

Sincerely,

Judith Kendrick

Judith Kendrick
F/V ADVANTAGE
LLP# LLG1620

cc James W Balsiger
Alaska Regional Director / NMFS

cc Phil Smith
Program Administrator
RAM Division / NMFS

AGENDA C-2
SEPTEMBER 2000
Supplemental

Preliminary Comments

on the

Draft Environmental Assessment

Interactions Between the Pacific Cod Fisheries

In the Bering Sea, Aleutian Islands and the Gulf of Alaska

And Stellar Sea Lions

Submitted by:

High Seas Catchers' Co-op

120 Lakeside Avenue, Suite 230
Seattle, Washington 98122
Phone 206-399-0742
Fax 206-860-1418

Date:
August 30, 2000

To:
National Marine Fisheries Service
North Pacific Fisheries Management Council

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4.1 Where is the AI?
4.2 Separate AI TAC or harvest limit
4.3 Close the AI cod fishery?
- 4.3.1 Size of cod
- 4.3.2 Percentage of Cod in Diet
- 4.3.3 Depth
- 4.3.4 CPUE and Localized Depletion
- 4.3.5 Trophic Interactions
- 4.3.6 Sea Lion Population
- 4.3.7 Positive Cumulative Impacts
- 4.3.8 Natural closures
- 4.3.9 Experimental Design
- 4.3.10 Foraging Success
- 4.3.11 Correlations
- 4.3.12 Conclusion

4.4 Do fishery removals of Pacific cod affect the foraging success of Steller sea lions in the AI?

Preliminary Comment on the Cod and Steller Sea Lions EA

1.0 Purpose of the Analysis?

The Draft EA begins on page 8 with a "Purpose and Need for Action" that states: **"The purpose for this action is to develop and implement measures to reduce or eliminate competition between Pacific cod fisheries and Stellers..."** by taking qualitatively predetermined types of measures to close areas and spatially and temporally disperse fishing.

Unless there is a "specter of a foregone conclusion," the "purpose" ought to explicitly include the need to evaluate the likelihood that fisheries removals are a significant factor in the failure of sea lion populations to increase. The document does provide the proper context for making such an evaluation beginning on page 59, where it lays out the three questions that must be asked in assessing the significance of competition between fisheries and sea lions relative to cod.

1.1 The Critical Third Question

The three questions the agency uses to examine the need to take action related to overlap or competition are:

1- Do competitors use the same resource?
2- Does the use by one competitor limit the use by another competitor?
3- Does the restriction constrain or limit the other competitor in some manner?

However, the EA effectively disposes of the question in mere three pages (with appropriate references to material presented elsewhere in figures and tables,) as: 1- yes, 2- yes, depending on time/area scale, 3- unanswered, except to state "it is NMFS opinion that the Pacific cod fishery under Alternative 1 is compressed...and removes excessive amounts...from CH." The key flaw of the document, is that NMFS offers an opinion with respect to question #3, rather than an analysis justifying how that opinion was reached.

1.2 The Crucial Assumption

The RIR , that begins on page 85, states the "Objective of the Action" is to "implement measures to reduce competition." This again implies that the agency has found that significant competition that limits Stellers exists. A footnote on page 87 speaks to a ""crucial assumption" that "the mitigation actions are effective in improving the state of the Steller sea lion population in western Alaska." While the assumption is clearly critical to a net benefit analysis, it is simply an assumption. Nowhere in the

EA/RIR is the assumption tested, though many of the bits of information needed to do so are scattered through the document, or exist in previous BiOp or RFRPA documents.

The EA sidesteps the need to test the assumption by reverting to an "attempt to demonstrate the relative probability of competition" for three alternatives (page 61.) It is intuitively obvious that the more restrictive a measure is on the fishery, the greater the "relative probability" that it will reduce competition. However, that begs the question posed on page 60 of whether the competition results in **"restriction in the availability or use of a resource (that) constrains the second competitor (sea lions) in some manner."**

2.0 Toward a Conceptual Model to Evaluate the Significance of Competition

Testing the assumption requires a qualitative conceptual model that makes use of quantitative inputs, where ever possible, to provide a frame of reference or context, within which to evaluate the significance of removing or not removing a given percentage of certain size classes of the cod biomass from CH.

We must be able to ask:

> "If there are certain number of sea lions in a given area, and they consume a certain quantity of a variety of prey annually, and there is a certain tonnage of standing biomass of those species which occur in their diet in that same area, will the of some amount of cod (of the sizes generally consumed by sea lions) significantly impact their foraging success (not limited to foraging for cod), as it relates to the question of nutritional stress?"

Thus, there is a need to bring together:

- A weighting of identified anthropogenic and natural factors contributing to the decline
- A weighting of factors contributing to the failure to recover
- The population of sea lions by area
- The daily consumption rates of sea lions
- The standing biomass of various prey species
- The biomass of cod
- The cod fishery's exploitation rate
- The fishery's exploitation rate on those size classes of cod used by sea lions
- The sea lions' exploitation rate on those size classes of cod
- The role of cod as a competitor for other sea lion prey
- Quantification of the degree of overlap by size, area, and season

The EA does contain some information pertaining to each of these points. However, the use of the information is superficial and the information itself is often aggregated across all areas in such a manner as to make it less useful. Therefore, the following is an attempt to provide supplemental analysis of datasets made public by NMFS, either in this

or previous documents, or in response to data requests made since the June, 2000 Council meeting.

3.0 Supplemental Information

3.1 Weighting Anthropogenic and Natural Factors Involved in the Decline

As the EA states on page 11, the search for a single cause for the decline is a misleading oversimplification. However, it is important to weight the factors to the extent possible in order to identify the "reasonable likelihood" that fisheries mitigation measures are necessary or will be effective in improving the state of the Steller sea lion population in western Alaska.

There was a great deal of information on anthropogenic factors that may have contributed to the decline of Steller sea lion populations include in the December 1998 BiOp. BiOp-1 and BiOp-2000 are part of the administrative record off of which the current EA "tiers." Perhaps it would be useful to review some of that information.

- Intentional kill (page 85) 34,000 from 1960-1990 (Alverson, 1992)
- Incidental kill (page 84) 50,000 from 1960-1990 (Alverson, 1992)
- Alternative estimate of incidental kill (page 84) 21,330 (6,500 plus 14,830) from 1966 – 1988.

The December, 1998 BiOp mentions that this amount (21,330) of incidental kill could account for 16% of the decline in BSAI and 6% in the GOA. (Loughlin and Perez, 1991) It seems that a methodology has been developed and could be used with each of the quantifications of anthropogenic kill types.

- Commercial harvesting (page 70) accounted for 45,178 pups takes from 1963-1972 (Merick et al, 1987)

Wouldn't an excessive harvest rate on pups in late 60s and early 70s impact the reproductive potential of that generation during the late 70's and 80's?

If an incidental catch of 21,330 over 22 years explains 16% decline, what percentage of the decline does 45,178 pup kill over 10 years explain?

- Subsistence harvesting (page 71) 448/year from 1992-1995 (Wolfe & Mishlerl, 1993,4,5,6)

Was the rate consistent in prior years? 450/year equates to 4,500/decade. While not sufficient to explain the decline it is a cumulative impact with these other non-nutritional anthropogenic factors.

In addition to the quantification of anthropogenic kills, the BiOp-1 mentions natural factors such as killer whale and shark predation and disease (page 66) but makes no attempt at quantitative estimates.

- Killer Whale predation

An August, 1999 memo on Sea Lion research by Loughlin, et al. (pg. 14) refers to a "recent unpublished study on possible rate of mortality due to killer whales." Is this Barrett-Lennard, et al.? What does it say?

- Disease – abortions

The same memo (pg. 15) refers to a unexpected "high rate of abortions observed in animals collected in the 1970's and 1980's." Is there any quantitative data related to this? Who has it?

3.2 Weighting Factors Involved in the Failure to Recover

The factors involved in the decline need not be the same factors that inhibit recovery, nor does the weighting of factors need be the same in both cases.

Again the December 1998 BiOp-1 provides useful information.

- Pup production from current population levels is expected to be 8% per year (40,000 population * 8% = 3,200 pups per year) – page 71 (from Hill and DeMasters in prep in 1998)

The discussion in BiOp-1 appeared to present a hypothetical case. Is the paper finished and available? What is the "expected value" of annual pup production at current population levels. It would be helpful to have a specific estimate of how many pups would be produced given the demographics of the current population, and what the expected annual mortality for the population as a whole would be under "normal conditions" or conditions where nutritional stress was not a factor. These two estimates could be combined to provide an "expected net population increase" estimate by area (WAI, CAI, EAI/EBS, W/C/E-GOA)

- Killer whale predation. BiOp-1 does provide some further information on killer whale predation:
  - One killer whale stomach from which 14 sea lion pup tags were recovered (page 55)
  - 126 respondents reported 32 incidents involving killer whales and sea lion mortality out of 492 interactions (6.5%) (Barrett_Lennard, pg.54)
  - "such predation may account for a significant portion of natural mortality at the current low size of sea lion populations" (Barrett-Lennard, pg.55)

Other sources of information relevant to evaluating the likelihood that Killer whales could "crop" the pup production include recent papers:

- Estes: In a recent paper marine mammologist, Estes theorizes an explanation for the 70% decrease in Aleutian Island otters is killer whale attacks. Estes further speculates this resulted from a shift by killer whales from targeting sea lions to targeting otters.
- Another paper, "The Impact of Killer Whale Predation on Steller Sea Lion Populations in British Columbia and Alaska" (Barrett-Lennard, et al.) suggests that 18% of ongoing sea lion mortality may be the result of killer whales.

The BiOp-1 also indicates subsistence harvesting is ongoing.

- Subsistence harvesting (page 71) is ongoing at about 448/year from 1992-1995 (Wolfe & Mishlerl, 1993, 1994, 1995, 1996)

What is the rate in subsequent years? 450/year = 4,500/decade. While not sufficient to explain the decline, it is a cumulative impact that could have more significance at lower population levels.

3.3 Sea Lions and their Foraging Needs and Opportunities

3.3.1 Sea Lion population estimates

A table of NMFS's best estimate of populations of sea lions by areas by year was presented in BiOp-1 in table 7 (pg. 157). It would be helpful to have that table updated for the current EA. The information on page 54 of the EA is confusing (even though it is supplemented with by Fig. 27). It switches from total population estimates, to non-pup counts, to counts with pups. The table should include fields for pup counts, non-pup counts, extrapolated total population by area (E-GOA, C-GOA, W-GOA, EAI/EBS, CAI, WAI) including the eastern stock, with updates of the most recent counts.

3.3.2 Daily Consumption Rates of Stellers

Page 55 of the EA provides an estimate of total annual sea lion prey consumption that does not seem to fit with the daily consumption rates and population estimates provided in the EA.

The EA provides a range from 5.2 kg/ day to 12 kg/ day. Going with the high end, 365 days x 12kgs = 4380 kgs/year/individual. The EA provides an estimate of annual EBS consumption of 185,200 tons of which 140,700 tons is fish and in turn 69% is "commercial" groundfish, or 97,083 tons. (What is the other 24%? Even if cephalopods are excluded from being "fish," there is nothing in the rest of the EA in fig. 28 or table 21 to suggest 24% of the diet is non-fish. BiOp-1 (pages 147-155) does summarize about 20 stomach content studies or feeding observations, which indicate consumption of crabs, clams, fur seals, and mussels. It is of note that many of these stomach content studies rank cephalopods much higher than the scat studies included in the EA.).

185,200 tons divided by 4.38 tons per day = 42,286 individuals. Even assuming the only caloric value comes from the groundfish consumption. 69% of 140,700 equals 97,083 tons divided by 4.38 tons per day = 22,165 individuals. Neither of which seems consistent with the Eastern AI (EBS) population estimates (or are there more EBS sea lions not included in the EAI estimate?)

If the 97,083 tons is divide by 5,000 animals (a number close to the EAI count as indicated in Fig. 27) the resulting daily consumption would have to be 53 kg/day of groundfish. Overall consumption of 185,200 / 5000 would be 101 kg/day, an order of magnitude greater than the daily consumption rates in the text.

If we are to use these estimates in forming a conceptual model of competition and the significance of overlap, it is essential to know that we are using the best available data regarding daily/annual prey consumption by Stellers.

Additionally, the presentation on page 290, table 21, is a copy of a table i received directly from Tom Loughlin with an explanatory note that, "All prey are not listed here, only those occurring in frequencies of 5% or higher." This may or may not be significant. If there are large numbers of "infrequently" occurring prey, they could still be a significant part of the diet. The stomach content studies in BiOp-1 suggest this could be the case.

3.3.3 Standing Biomass of Various Prey Species

The EA (pg. 55) indicates 140,700 tons of fish is 0.4% of the standing biomass in the EBS consumed annually by all predators. Is it correct to impute the standing biomass of prey in the EBS to be 35,175,000 tons (140,700/.004) or 24,270,750 tons (97,083/.004)?

Table 21 indicates Frequency of Occurrence for a number of species besides pollock, mackerel and cod, some of which are not species for which an ABC is calculated. Have biomass estimates for these species been calculated for other purposes, outside the development of SAFE documents? Does NMFS have any biomass estimates for the various survey areas (AI, EBS, GOA) for the following species: Sandlances, Herrings, Sculpins, Squid, Ocotopods, Greenling (other than Atka Mackerel) Snailfish, Salmon, Sandfishes, Capelin, and Needlefishes?

Would estimates of the biomass of such species be available in the context of the multispecies virtual population analysis model of the eastern Bering Sea (referenced on page 30 of the EA)?

3.4 Size of Cod Taken in the Fishery

The question – "Do Stellers and the cod fishery use the same resources?" – has several dimensions. One of the necessary steps in evaluating the significance of the trawl harvest

of cod, in terms of net impact on prey availability to sea lions, is to examine the overlap in the preyfield of the fishery and the sea lions based on size classes of cod.

The June, 2000 discussion paper provided a "Table 3" on page 18. That table had a sample size of N=887 in the summer samples, and N=1364 in the winter samples. In the winter samples the cod fell into 3 size bins: 35-60cm = 76%, 28-34cm = 16%, and <28cm – 8%, with the upper end of the range being 60cm.

The EA provides a new figure 31 on page 235. The methods used to produce this new data set are described on page 56, with results on the following page. The results section begins by stating that cod "occurs in up to 62% of the scats (Figure 29.)" While it is true that 62% of the scats from a single rookery contained cod, perhaps the more useful information is contained in Table 21 on page 290, that provides the averages by specific area. Presenting only the high end of a range suggests an editorial bias.

At any rate, the results section goes on to say that "80% of the Pacific cod remains...from ...scats...were from 'very large' fish up to 80cm in total length." This is interesting, since later in the paragraph it states that there was a "total length range of 30-75cm with a mean of 50cm" and "Therefore, on average, 80% of the Pacific cod...were approximately 50cm."

This doesn't seem to fit with the Figure 31 on page 235, which shows cod of 10-20 cm and 20-30cm, but no cod 80 cm. It is also interesting that Figure 31 is based on a sample with an N=88 fish. Nevertheless, let us accept that the mode might be around 50cm, tailing of between 60 and 75cm. Until the authors of the EA provide more clarity it seems that the more robust data set would be the one with the larger N, so the rest of this discussion focuses on the 60cm point. (Before the council meeting i will update the tables below to use a 70cm point, but these computations were completed before the new EA.)

But before we leave the point, just how large is "very large?" An 80cm cod weighs about 6 kgs. But to put it in context, 57% by numbers and 78% by weight, of the cod harvested in the AI trawl fishery are from fish larger than 80cm. Moving out the 90th percentile, gets you a 105cm cod which weighs about 15 kgs. (now you are starting to talk big fish – but our biggest cod weighed in at about 95 lb. – now that is a "very large" cod, but i digress...)

The observer program provided a data set with length frequencies for the cod target fisheries. This information was used to convert numbers of fish by length bins (in 1cm intervals) to percentages of weight of harvest. This was then used to produce a set of graphs showing the cumulative percentage of the catch weight comprised of cod less than 60cm. (In contrast to the scat data, this is a fairly robust set of numbers. There were over 46,000 sampled hauls, with an N>1.3 million fish.)

There is a range in the percentage of overlap based on weight of cod catch, depending on gear, season, and area. The range in the 1st trimester, when most of the catch has occurred, is:

- 2% of the catch by weight under 60cm in the 1st trimester AI trawl fishery
- 15% of the catch by weight under 60cm in the 1st trimester BS trawl fishery,
- 21% of the catch by weight under 60cm in the BS longline fishery
- 10% of the catch by weight under 60cm in the 1st trimester GOA pot fishery,
- 19% of the catch by weight under 60cm in the 1st trimester GOA trawl fishery.

The following are summary tables.

			N	N
longline fishery 1	21%	40%	15,463	464,007
longline fishery 2	21%	42%	1,862	53,018
longline fishery 3	13%	30%	11,840	418,810
pot fishery 1	11%	23%	2,231	42,993
pot fishery 2	15%	31%	1,813	52,133
pot fishery 3	6%	16%	507	13,893
trawl fishery 1	15%	39%	11,879	262,302
trawl fishery 2	38%	66%	444	4,923
trawl fishery 3	7%	25%	160	1,752

			N	N
longline fishery 1	6%	20%	3,478	75,309
longline fishery 2	4%	16%	62	1,758
longline fishery 3	12%	32%	136	3,301
pot fishery 1	2%	8%	396	5,723
pot fishery 2	8%	20%	215	2,254
pot fishery 3	9%	25%	61	842
trawl fishery 1	2%	10%	1,940	38,800
trawl fishery 2 - No Samples			12	0
trawl fishery 3 - No Observed hauls			0	0

			N	N
longline fishery 1	19%	39%	399	7,580
longline fishery 2	12%	23%	33	480
pot fishery 1	10%	19%	1,407	26,162
pot fishery 2	13%	24%	193	3,569
pot fishery 3	13%	27%	150	2,739

trawl fishery 1	16%	36%	2,944	76,085
trawl fishery 2	17%	28%	86	323
trawl fishery 3	29%	55%	214	5,743

An appendix to this document will be provided at the Council meeting, "Cod prey, depths, & size and Sea lions.xls," that contains a number of worksheets and graphs. Three of the graphs show the cumulative % of cod by weight by size interval for the three management areas (AI, EBS, GOA.)

3.5 Trophic Interactions

3.5.1 The role of cod as a competitor

As noted in the discussion about the size of cod taken by the fishery, the question – "Do Stellers and the cod fishery use the same resources?" – has several dimensions. Another necessary step in evaluating the significance of the trawl harvest of cod, in terms of net impact on prey availability to sea lions, is to examine the role of cod of the sizes taken by the fishery as direct competitors with sea lions for other prey.

The EA examines this question under "Trophic Interactions" (pages 28-30.) It concludes that harvest of cod "would not result in no net loss of prey from a sea lion perspective during that season and area." The trophic interaction section of the analysis appears to have been written in response to a simple compilation of information from a number of studies by Livingston, et al, that i submitted to the agency (covered below).

3.5.2 Is "No Net Loss" Possible?

Accepting the caveats identified in the EA that:
1- winter lasts only 91 days,
2- that the winter DR is half the annualized ration (though Livingston, et al, show that the percentage of pollock doubles in the sea lion diet during the winter in tech memo NMFS F/NWC-207 page 34 & 35)
3- and the 91 day "winter" prey consumption is 1/3 it's body weight,
one can still not dismiss the possibility of "no net loss of prey."

The question of whether fishery removals affect foraging success of Stellers, requires that one integrate the information on size of cod taken by the fishery and cod diet studies.

Only a small fraction of the fishery catch is under 60cm, and the harvest of a 1000 tons of cod in the 1st period of the year may represent as little as 20 tons of removal of cod (at 2% < 60cm in the AI trawl fishery), or as much as 210 tons (in the BS longline fishery), of the sizes of cod for which the Stellers are competing with the fishery. Thus, the net loss question rest on the amount of, and overlap in, prey consumption by the 980-790 tons of cod > 60cm, which are not themselves a significant part of the sea lion preyfield.

One third of 790 is greater than the 210 tons of cod removals of the sizes likely to be in the sea lion preyfield , so the possibility of "no net loss" still exists.

The significance of examining the trophic interaction question does not hinge on whether the final balance is "no net loss." The importance is whether in combination with other factors it diminishes the overall impact of the cod fishery on sea lions. And so, i offer up the following exercise that was submitted to the authors of the EA.

3.5.3 What Do Cod Eat and How Much?

In looking at the implications of prey/predator interactions, where cod is the prey of fishers as well as of sea lions, it is an open question whether the removal of a unit of cod by the fishery is a net gain or loss to sea lions.

To examine this question a significant portion of the "best available data" is the work of Pat Livingston and those working with her on food web dynamics. Pat Livingston, M-S. Yang and others have published a series of at least 4 documents on food habits of cod and other groundfish:

1. "Groundfish Food Habits and Predation on Commercially Important Prey Species in the Eastern Bering Sea from 1984-1986" NOAA Tech Memo NMFS-F/NWC-207 - Table 3, pg. 57
2. "Food Habits of the Commercially Important Groundfishes in the Gulf of Alaska in 1990, 1993, and 1996." NOAA Tech Memo NMFS-AFSC-112 - Table 7, pg. 29, 30
3. "Diets of the Important Groundfishes in the Aleutian Islands in Summer 1991" NOAA Tech Memo NMFS-AFSC-60 - Table 2.1, pg. 18,19
4. "Groundfish Food Habits and Predation on Commercially Important Prey Species in the Eastern Bering Sea from 1990 to 1992" AFAC Processed Report 96-04

These reports set out a methodology for estimating the consumption of various prey species by cod in the EBS. It is first set out in the "Methods" section, pg. 3 of the NMFS-F/NWC-207. It essentially estimates consumption as a function of the daily ration (DR) times the biomass (B) of the consumer (cod in this case) times a number of days times a portion of the weight of the prey species in the diet (P).

The method is further refined, in that it considers the fraction of the biomass of cod that is of a particular size class and assigns a DR value based on that size class. The DR for cod is found on pg. 53. For cod over 60 cm that value is 0.007 times body weight. It also considers percentage weight of prey species on an area specific basis (applicable to the 6 EBS survey stratum.) Information on the percentages of prey by various years and areas are found in tables in the four publications.

The NMFS-F/NWC-207 report estimates total consumption of a variety of species by the total cod biomass. In examining the sea lion issue, it would seem appropriate to look at those species where there is an overlap in consumption by both cod and sea lions. It would also seem appropriate to make the estimate based on the biomass of cod removed by the fishery, based on the sizes of cod the fishery harvests.

The report notes a diet shift by cod dependent on the size of cod and season. On page 34 & 35 there is information indicating that cod's diet shifts from crustaceans to finfish as they mature, and that the proportion of pollock in the diet is higher in winter than in summer.

3.5.4 Methods (Plagiarized from Livingston with apologies)

Using the information in these reports I have attempted to apply the basic method for estimation to evaluate the extent of competition between cod and sea lions for prey of interest to sea lions. The method I used is as follows: C = DR * B * D * P Where C is the consumption of a particular species, DR is daily ratio, B is a unit of biomass of cod of a certain size (1000 tons of cod >60cm), D is the number of days (365), and P is the percentage of a particular prey species by weight in the sampled cod stomachs for an area. The values for P are all derived from tables in the four publications. The particular prey species chosen for evaluation were based on a hierarchy of occurrence of those species in the scat samples of sea lions as shown in Table 2 of the June 6, 2000 discussion paper on cod fishery and sea lion interactions.

3.5.5 Caveats:

There are a number of caveats implicit in my simplified approach:

- DR appears to have been derived based on summer time diet and may change with changes in water temperature through the year.
- B in my model is 1000 tons of cod harvest by the fishery. Obviously, all harvest does not occur on January 1st, and there would have been both growth and mortality for those cod if left unharvested. The degree to which those factors off set each other for a given size class of cod is something that Grant Thompson might be able to evaluate, but is certainly beyond my skill. For my purposes, i assume they are in rough balance.
- With regard to D, i am estimating the amount of prey that the cod would have eaten over the next 365 days without regard to the calendar date on which a particular cod was harvested.
- The values for P were almost all determined from samples taken during months 5-9 on summer trawl surveys. There are SE's given for some of these values, but for simplicity I have used the point estimate. As with cod, there would be growth and mortality associated with the prey species. In my simple model i am just looking at the absolute consumption of these prey species, without trying to evaluate whether the offsets of growth and mortality would result in more or less prey biomass X number of days out.
- In some of the tables in the four publications it is clear that the values for P are specific to size classes of cod, in other tables it appears that they may be the value for all sampled size classes combined. It would seem like this would tend to produce an underestimate of the consumption of a particular finfish prey species by cod over >60 due to the diet shift to from crustaceans to finfish as cod age.
- There is a large amount of inter-annual variation in the values of P. Likewise, there is likely to be intra-annual variation as cod migrate between survey strata areas.

However, all the published information was utilized in this simplified exercise, and there is a fair amount of consistency in the resulting estimates.

Given the foregoing caveats, i applied the above described method in a simple spreadsheet model to estimate cod consumption of various sea lion prey by area.

3.5.6 Results (annual version):

- In the GOA 1000 tons of cod would consume between 504 and 752 tons per year of selected species that are also significant portions of the sea lion diet.
- In the EBS, using 3 years data over all survey stratum, 1000 tons of cod would consume 1458 tons of selected species (primarily pollock.)
- In the EBS 1000 tons of cod over 60cm survey stratum 5 (the area that most overlaps SCA and where most CV trawl catch occurs) would consume 834 tons of pollock a year based on the average of 1984, 1985, 1986.
- In the EBS 1000 tons of cod over 60cm survey stratum 5 (the area that most overlaps SCA and where most CV trawl catch occurs) would consume 834 tons of selected species a year based on the average of 1984, 1985, 1986.
- In the AI 1000 tons of cod over would consume 1691 tons per year of selected species that are also significant portions of the sea lion diet.

The spreadsheet with the calculations is attached and the following is a summary table.

Summary of Annual Cod Prey Consumption Estimates. Per 1000 tons of cod, for selected species of sea lion prey	
1990 GOA cod consumption of sea lion prey	504
1993 GOA cod consumption of sea lion prey	712
1996 GOA cod consumption of sea lion prey	752
1991 AI cod consumption of sea lion prey	1,691
1984-86 EBS cod consumption of sea lion prey	1,458
1984-86 EBS (S-3) average cod consumption of pollock	478
1984-86 EBS (S-5) average cod consumption of pollock	834
1984-86 EBS (S-6) average cod consumption of pollock	1,094
1990 EBS (S-3) cod consumption of sea lion prey	1,621
1990 EBS (S-5) cod consumption of sea lion prey	1,427
1990 EBS (S-6) cod consumption of sea lion prey	1,654
1991 EBS (S-3) cod consumption of sea lion prey	1,523
1991 EBS (S-5) cod consumption of sea lion prey	1,134
1991 EBS (S-6) cod consumption of sea lion prey	1,483
1992 EBS (S-3) cod consumption of sea lion prey	1,426
1992 EBS (S-5) cod consumption of sea lion prey	1,484
1992 EBS (S-6) cod consumption of sea lion prey	1,981

3.5.7 Revised Winter Cod Prey Consumption Estimate

The foregoing was provided to the authors of the EA, and is evaluated in the document. The caveats identified were explored, and the EA suggests that a more appropriate winter DR is 0.3-0.4% (BWD). The EA also suggests that it is only appropriate to consider consumption during the critical winter months, which it defines as 91days in duration. This seems inconsistent with the definition of winter presented elsewhere in the EA as lasting from Jan.1 – April 30th , it also seems inconsistent with the proposal for no fishing between Nov. 1 and Dec. 31st.

3.5.8 Results: (winter version)

Re-running the spreadsheet using the mid-point winter DR of 0.35% BWD and a period of Nov. 1 - April 30th of approximately 180 days, produces the following revised table:

Summary of Winter Cod Prey Consumption Estimates. per 1000 tons of cod for selected species of sea lion prey	
1990 GOA cod consumption of sea lion prey	124
1993 GOA cod consumption of sea lion prey	176
1996 GOA cod consumption of sea lion prey	186
1991 AI cod consumption of sea lion prey	374
1984-86 EBS cod consumption of sea lion prey	359
1984-86 EBS (S-3) average cod consumption of pollock	118
1984-86 EBS (S-5) average cod consumption of pollock	206
1984-86 EBS (S-6) average cod consumption of pollock	270
1990 EBS (S-3) cod consumption of sea lion prey	400
1990 EBS (S-5) cod consumption of sea lion prey	352
1990 EBS (S-6) cod consumption of sea lion prey	408
1991 EBS (S-3) cod consumption of sea lion prey	375
1991 EBS (S-5) cod consumption of sea lion prey	280
1991 EBS (S-6) cod consumption of sea lion prey	366
1992 EBS (S-3) cod consumption of sea lion prey	352
1992 EBS (S-5) cod consumption of sea lion prey	366
1992 EBS (S-6) cod consumption of sea lion prey	488

Just as it is not necessary that there be a single factor explaining the decline of Stellers, the fishery is neither condemned nor exonerated by a single factor. The fact that cod are competitors with sea lions must be weighted, whether or not their consumption perfectly balances their own role as prey.

3.5.9 Other Issues Concerning Trophic Interactions Raised in the EA

The EA states (pg. 28) that "...Atka mackerel... may constitute less than 5% of the diet by weight in any given year." That may be true in areas other than the Aleutian Islands, but is unlikely to be true in the AI. The 1991 study by Yang examined the stomach contents of 659 cod and found 27% Atka mackerel by weight. This is consistent with

observations we have made on board the Muir Milach of cod stomach contents in the AI over 20 years of fishing cod there.

The EA notes on page 28 that cod >60cm "consume pollock of about 5-50cm," and on page 29 that "most of the pollock biomass consumed by large Pacific cod (>60cm) mainly consists of pollock >30cm." Yet on page 30 the discussion of trophic interaction states "animals...that consume age 0-2 pollock appear to benefit most *(if fishing cod releases prey –df)*...while animals...that consume older pollock don't appear to realize an increase." In applying the results to sea lions "we infer that since they consume large pollock" they would not benefit from increased removals of cod as pollock predators. However, the EA had just established that most of the biomass of pollock eaten by cod >60cm were >30cm, which certainly are not age 0-2 pollock.

As noted earlier, restricting the examination of the impact of cod as a competitor to a 91 day window seems inconsistent with the thrust of the EA which seeks restrictions on the cod fishery in a far longer period.

It is interesting that the multi-species modeling experiments discussed in the EA leave out sea lions, the species of most concern to the analysis. None the less, it is also interesting that multispecies modeling shows that "at our present level of fishing for cod, other species do not appear to realize much change in their prey base in either a positive or negative direction."

The real question is whether at "our present level of fishing for cod," Steller sea lions realize "much change in their prey base in either a positive or negative direction" as a result of cod fishing. This requires going back to evaluating the significance of the harvest of 10,000 tons more or less of cod, against a backdrop of 35 million tons of standing biomass of a variety of prey species.

3.6 Sea lion dive depths and fishery depths

3.6.1 Sea lion dive data

The EA provides a very brief recap of sea lion diving depths on page 53. However, the EA only provides maximum dive depths. The EA tiers off of previous work, and the April 5, 1999 draft RFRPA provides more information that would be more useful in evaluating the significance of "overlap" in fishery depths and sea lion foraging depths (pages 105-109 fig. 4-1 & 4-2)

Fig. 4-2 provides a time series of dives by four sea lions showing only the maximum daily dive depth. It indicates that the "female age 1-2" rarely dove below 50 meters (3 days out of 5 months.) The age 2 male dove to 200 meters on perhaps one half of its diving days (but in a five month period it appears to have no dives on most days). The age 2 female dove to a range of 125 to 200 meters on about one third of its dive days, but for the remainder its maximum dive was in the 25-75 meter range. The age 1 male shown on fig. 4-2 never dove below 25 meters. However, the text indicates the maximum observed depth of young-of-the-year was 72 meters.

Knowing the maximum dive depth does provide one part of the picture. However, Figure 4-1 provides important context as well. Even for the Adult sea lion in winter, dives below 100 meters do not appear to exceed 10% of the dives (even excluding all dives less than 10 meters as possible grooming or 'porpoising' behaviour).

From the material in the EA or previous documents, it doesn't appear that a significant portion of the overall dives, or even a large portion of the maximum daily dives are over 100 meters. The statement on page 61 of the EA that "sea lions have been observed foraging at depths in the range 75-250 meters year-round" seems potentially misleading. There is nothing to indicate that the vast majority of observed dives (again excluding <10 meter dives) which were less than 75 meters were not also foraging dives (nor any assurance that the males who dive to 250 meters weren't showing off).

3.6.2 Fishery depths

The EA states on page 61 that most of the fishing is between 75 and 150 meters. This is certainly correct, though there are differences by area. For example, in the AI over 88% of the hauls in the trawl fishery are deeper than 100 meters, as shown in this summary table of trawl depths.

[illegible]	[illegible]	EBS [illegible]	[illegible]
69	1.83%	11.57%	15.34%
77	2.32%	20.63%	26.97%
100	11.58%	63.12%	64.43%
119	37.95%	77.21%	90.44%
133	58.03%	85.16%	96.06%
163	91.30%	95.91%	99.04%
183	95.68%	97.80%	99.41%

Given the available information on sea lion dives presented in the EA and supplemented by the previous documents, one might reasonably conclude that the vast majority of sea lion foraging dives are less than 75 meters, and the vast majority of cod hauls are greater than 75 meters. While this doesn't mean there is no "overlap," it does indicate that the overlap is minor.

3.7 Foraging Success

3.7.1 Relative biomasses of various sea lion prey

The hypothesis that sea lions 'prefer' to hunt schooled fish, and that trawling interferes with their hunting by breaking up the schools is highly speculative. It is clear that the rate of success on non-schooling fish is higher in many cases than with cod (snailfish, octopods, greenling, sculpins, salmon). It is also clear that available biomass of these other species is far lower than the biomass of cod.

Eric Brown at NMFS-AFSC-RACE provided a revised table showing the "Mean CPUE (kg/km2) for the 20 most abundant groundfish and total sampling effort in each International North Pacific Fisheries Commission statistical area during the 1997 triennial Aleutian Island bottom trawl." Pacific cod CPUE ranked fifth at 1,333 kg/km2, sculpins 15th at 203 kg/km2, while snailfish and octopods didn't make the top 20 species list.

The of following tables includes 1997 trawl survey data provided by NMFS-RACE, and contrasting percentages of FOO from Table 21 page 290. (In both cases mackerel are excluded from the greenling category, however the scat category includes all cephalopods while the survey is octopods only.)

Species	1997 AI Trawl Survey			Scat
	Total Number Encountered	Total Kilograms in All Hauls	Number of Hauls with Encounters	% of CAI Winter Scats
Snailfish	90	21.3	44	13.90%
Sculpins	13,207	2531.3	408	13.90%
Octopods	96	149.8	56	13.10%
Greenling	31	24.4	6	26.20%

The highest bycatch rate of salmon in the AI trawl fisheries is 0.068 salmon per 1000 kgs of groundfish (table 19, page 268 of the EA.) While trawls are not a perfectly selective device for sampling salmon abundance, the fact that there are several orders of magnitude difference between salmon encounters and cod encounters, suggests that salmon may be less abundant in the winter than cod, yet salmon still occur in 11.5% of winter scats in the AI vs 17.2% for cod. This suggests that sea lion foraging is not dependent upon patchy schooling behaviour for its success.

3.6.2 Patchy distribution

It is believed that sea lions feed more extensively at night (personal communication Beth Sinclair). It is also known that cod schools disperse at night (personal communication, 100 trawl skippers). While it is possible that the limited day time feeding is focused on schooled cod, there is nothing to suggest that it is easier to find a commercial scale school of cod, than to for a sea lion to find its Daily Ration of cod when they are dispersed. Certainly, if hunting is random dispersion would increase the probability of encounter.

3.7 The biomass of cod

Table 3 of the EA (page 245) provides a time series of biomass estimates of various components of the cod population. To the extent that sea lions prey on cod less than 3 years of age, the age 3+ biomass estimate is somewhat incomplete in evaluating cod biomass and sea lion foraging opportunities.

The 1999 SAFE documents provide further information on population numbers and biomasses by age. i have assembled these in a spreadsheet for both the GOA and BS/AI, supplemental comment based on those tables will be submitted at the Council meeting.

3.7.1 The exploitation rates of the fishery & sea lions on cod

Fig. 19 provides a graph of the exploitation rate of the fishery on the age 3+ biomass. However, it is clear that the fishery and sea lions have different selectivities, and that the exploitation rate by the fishery on younger age classes that are the primary target of sea lions differs greatly from the exploitation rate on older cod.

The synthesis model generates age specific estimates of population and on fishery harvest. By integrating the two data sets, one can better evaluate the significance of the area of overlap in the sizes of cod shared by sea lions and the fishery. Grant Thompson will be preparing those tables before the Council meeting, and i will submit supplemental comment based upon them at the meeting.

3.7.2 The exploitation rate of sea lions on size classes of cod

Developing age specific exploitation estimates for the sea lion "fishery" for cod requires an estimate of total consumption of cod by sea lions. This in turn requires an estimate of total cod consumed by sea lions. Given the uncertainty about the population estimates by area, the Daily Ration for sea lions, about how to translate Frequency of Occurrence to percentage of stomach contents, and the difficulty of sizing cod remains in sea lion scats, this is clearly a challenging undertaking.

3.8 Spatial and Temporal Dispersion

3.8.1 Inherent Temporal and Spatial Dispersion

Though nothing in regulation prevents all of the BSAI cod quota from being taken in the Area 509 during the first week of November under "status quo," the realities of gear apportionments, markets, fishing strategies, bycatch management constraint, etc. do result in spatial and temporal dispersion of the fishery.

This natural dispersion of the fishery far exceeds that found in most other fisheries. Consider crab fisheries, herring and salmon fisheries, rockfish fisheries, flatfish fisheries – none are spread over as much of the year, as wide an area, nor as many gear types.

The in-season management division provided a file of the "week ending date" (WED) data, which reports the cod catch by target/gear/wed/3-digit_stat_area/processing_mode. The BSAI cod target fishery alone breaks down into 405 cells in 1999. Roughly 10% of the cod TAC is taken in mixed target fisheries, which account for another 337 cells in 1999.

3.8.2 AFA, Pollock RFRPAs and Temporal Dispersion of the Cod Fishery

The pattern of the trawl cod fishery observed in the period from 1995-1998 has changed significantly as a result of the AFA. Nine catcher-processors that targeted cod immediately after the pollock A season were retired from the fishery and scraped as a result of the AFA. The duration of the A/B pollock season has been extended as a result of the combination of Coops and pollock RFRPAs.

Additionally, Coops have been implemented in the catcher vessel sector for pollock in 2000. The combination of Coops and pollock RFRPAs have also extended that fishery. The "Sideboards" applicable to the CV cod fishery have resulted in a restructuring of the CV trawl cod season and a more even catch rate by week during January through early April.

3.9 Quantification of the degree of overlap by size, area, and season

(this section will be supplied at the September Council meeting)

4.0 AI cod fishery

4.1 Where is the EAI?

There is a risk of confusion associated with evaluating the overlap between fishery and sea lion data sets for the AI in the EA. The fishery management designations for the Eastern Aleutians is area 541, which begins at 170 degrees west (central is 542 and western is 543). However, in the world of sea lion management folks the Eastern Aleutians are fishery management areas 518 and 519; and area 541 is the CAI.

4.2 Separate AI TAC or harvest limit?

Establishing a limit on the maximum percentage amount of the BSAI ABC of cod to be taken in the AI area, is a reasonable precautionary measure that is consistent with the establishing separate TACs for many other groundfish species in the AI. In developing such a limit, there are at least two different approaches. It can be a simple ratio of survey biomasses or historical catch patterns, or it can be done based on a stock assessment model that takes into account the fishery selectivities and differences in age/size composition of the stock in the AI.

Using the average historical catch over the last 5 or 10 years as the way of calculating the AI share of the TAC, this appears to be about 12% of the BSAI TAC or harvest.

We do have clear data showing the difference in size composition of the stock (both fishery and survey data indicate the modes in the AI are at least 10cm greater than in the EBS.) An AI specific stock assessment model may allow a different exploitation rate if an AI specific ABC is calculated based on the size/age structure of the AI biomass and

harvest. Once a stock assessment model has been developed for the AI cod, it would be appropriate to set and AI ABC and TAC.

Until then, an area harvest limit could be calculated based on either historical catch or survey biomass ratios. If survey biomass ratios are used, it may be appropriate to discount the smaller age/size classes in the EBS survey, since there is evidence that the AI stock is probably "funded" in part by EBS overflow.

	Average BSAI TACs	Average AI catch	AI catch as % of BSAI TAC	AI catch as % of BSAI catch
20 yr. Av.	194,414	16,233	8.35%	9.66%
10 yr Av.	217,050	25,588	11.78%	12.19%
5 yr Av.	235,400	27,763	11.79%	12.28%
2000	177,000	32,411	18.31%	na

4.3 Should the AI cod fishery Be Closed?

There is no justification to consider closing the AI, even if one were to granting the speculative "fishery induced nutritional stress" hypothesis. The overall AI area management measures are extremely precautionary, even under status quo, as long as a reasonable harvest limit is set for the AI as described above. The fishery takes a small percentage of the overall cod biomass, and cod make up a small percentage of the total biomass of all species of prey that are significant portions of the sea lion diet.

Size of cod

Cod taken by the fishery have a size distribution that shows minimal "overlap" with sea lion prey sizes. Less than 2% of the trawl cod harvest by weight is <60cm, and only 13% is <75cm.

Percentage of Cod in Diet

Cod are a 17.2% of the sea lion diet in the AI by frequency of occurrence. (fig.29, page 233)

Depth

The overlap in depths is limited, especially with regard to juveniles which are most susceptible to nutritional stress. While the ranges of depths of the fishery and sea lion dives overlap, the modes are quite different (see supporting data section 3.6).

CPUE and Localized Depletion

Consistently high CPUE data (personal communication with captain of *Muir Milach*) show that this fishery is not suffering localized depletion.

Trophic Interactions

Cod over 60 cm are significant competitors with sea lions for mackerel, octopus and pollock, etc. While few cod of >60cm are found in the sea lion diet, the estimated annual consumption of prey that are also significant in the sea lion diet per ton of cod, is greater than the weight of the cod itself (see supporting data in section 3.5).

Sea Lion Population

The central AI sea lion population has been relatively stable for several years, thus the concern expressed in Judge Zilly's injunction of imminent danger of extinction is not supported by the best available data. (see section 3.3.1)

Positive Cumulative Impacts

The total closure of the AI for pollock fishing, and the measures applying to the Atka Mackerel fishery (mackerel constitutes 69-92% of the sea lion diet) in the AI mean that there is plenty of more important prey available to sea lions. The Alaska State Board of Fisheries closure of the nearshore waters around Adak, though designed for other reasons, also provides a measure of protection to sea lions.

Natural closures

The AI area is a submerged mountain range with very few smooth "meadows". The majority of CH in the AI is un-towable ground that is naturally protected.

Experimental Design

Extreme options such as closure of the AI to cod fishing or CH limits that are clearly out of proportion to biomass distribution, and may compromise whatever it is the agency wants to learn about the AI closure for pollock. The cumulative impact concerns do not require mirror image treatment of fisheries, if their degree of "overlap" and "competition" are different. AI remains open to Atka mackerel even though it is the predominant prey of SSL in that region.

Nutritional Stress Hypothesis

The need for mitigating measures in the cod fishery flows from the hypothesis that there is competition/overlap in the preyfield. This requires a finding that the competition is in some way limiting and in turn rests on the hypothesis that the failure to recover is due to

"fishery induced nutritional stress." Nutritional stress (assuming it can be documented for the decade of the 1990's) does not necessarily equate to "fishery induced nutritional stress," and in the case of the AI cod fishery there is no reason to conclude that the cod fishery is contributing to nutritional stress.

Foraging Success

The hypothesis that sea lions 'prefer' to hunt schooled fish, and that trawling interferes with their hunting by breaking up the schools is highly speculative. It is clear that the rate of success on non-schooling fish is higher in many cases than with cod (snailfish, octopods, greenling, salmon). It is also clear that available biomass of these other species is far lower than the biomass of cod. It is believed that sea lions feed more extensively at night, but it is known that cod schools disperse at night.

Correlations

The natural variation in biomass of cod exceeds change in the amount of cod available to sea lions as the result of any of the options proposed in the analysis by orders of magnitude. To the extent that correlations have any value, the dramatic increase in the cod and mackerel populations from the 70's to the 80's correlate with the largest declines in sea lion populations.

Conclusion

Direct sea lion mortality information from anthropogenic sources, and natural factors such as killer whale predation, suggest an alternative hypothesis for the decline and failure to recover The EA acknowledges the evidence of regime shift. It should be evaluated as a mechanism for altering the carrying capacity, particularly through the role of large piscivorous fishes as competitors. Contrasting the cumulative significance of these factors to the significance of "fishery induced nutritional stress through the mechanism of competition" does not lead to a rationale for closing the AI.

4.4 Do fishery removals of Pacific cod affect the foraging success of Steller sea lions in the AI?

It is my opinion (and should also be NMFS's) that the AI Pacific cod fishery does not have significant overlap with sea lions, to a degree that would result in negative interactions, that would constrain or limit sea lions in some manner; and that a harvest limit of 12% of the BSAI TAC for Pacific cod would provide a reasonable likelihood of providing a level of precautionary protection that would preclude irreparable harm.

AGENDA C-2
SEPTEMBER 2000
Supplemental

ALASKA CRAB COALITION

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Seattle, Washington 98107
206 547 7560
206 547 0130 Fax
Email: acc-crabak@msn.com

DATE: August 31, 2000

TO: Mr. Clarence Pautzke, Executive Director
NPFMC
605 West 4th Avenue, Ste. 306
Anchorage, AK 99501-2252

FROM: Arni Thomson, Executive Director AT TOTAL: 3 Pages

RE: AGENDA ITEM C-2 PACIFIC COD/STELLER SEA LION INTERACTIONS

REQUEST TO MAINTAIN HISTORIC CATCH PERCENTAGE IN BERING SEA/ALEUTIAN ISLANDS CRITICAL HABITAT

Alternatives 2 and 3 of the Draft Environmental Assessment for Pacific Cod and Steller Sea Lions (August 23, 2000) to limit fishing in the Sea Lion Conservation Area (SCA), pose severe consequences for the already economically distressed Bering Sea pot fleet.

- As noted in the summary analysis of catches by gear type for 2000 (attachment), the pot fleet caught its share of the cod allocation (9% of the total TAC), during the winter trimester, since the opilio fishery was delayed until April first. Assuming the fleet's historic catch in critical habitat (CH) has been 77%, 13,145 mt of its Bering Sea catch of 16,918 mt was taken in the CH. In 2001 it is likely if the crab fleet has a season, it will be small and it will be delayed again until April, making the winter months prime time for the pot cod fishery.

- Using the NMFS preliminary cod models (attachment) for allocating cod catches by gear type for 2001, in light of the recommendations under alternative 2, to allow only 40% of the pot sector's annual catch in the first trimester and only 20% of that in CH, pot vessels would be limited to a catch of 1140 mt in Bering Sea CH in the winter of 2001. This equates to 8% of their Bering Sea sector allocation.

- Based on the NMFS cod models and allocation formula, a similar projection can be made for the Aleutian Islands. Pot vessels would be limited to 190 mt in CH, or 8% of their Aleutian Islands sector allocation.

- If pot vessels are required to fish outside CH and the SCA, lengthened travel time and reduced fishing time will make it financially unfeasible for the vessels to fish and return to markets.

- Pot vessels fishing outside critical habitat will be forced into gear conflicts with trawlers, resulting in excessive amounts of lost pots and there will also be increased bycatch of king and tanner crabs.

Weekly Cod Catch inBSAI by Gear Type 2000

	Trawl Metric Tons	% of TAC in of CH	Hook Metric Tons	% of TAC in of CH	Pot Metric Tons	% of TAC in of CH
01/01/00			662			
01/08/00			5061		45	
01/22/00	1324		5797		681	
01/29/00	3016		4973		1664	
02/05/00	5858		4882		2772	
02/12/00	3213		3979		2480	
02/19/00	6242		4441		2981	
02/26/00	5867		4993		4221	
03/04/00	4055		4515		2568	
03/11/00	5610		3789		2686	
03/18/00	7900		279		41	
03/25/00	7795		0.6		2	
04/01/00	7921		2.4		1	
04/08/00	5979		4		0.4	
04/15/00	5438		0.5		6	
04/22/00	4697		26		0.05	
04/29/00	2720		12		2	
Total Ist Tri	**77035**		**43416.5**		**20130.5**	
BS Catch	**56272**		**37034.5**		**16918.5**	
BS Catch in CH	**36211.0**	**60%**	**7906.9**	**21.30%**	**13145.6**	**77%**
AI Catch	**20763**		**6382**		**3212**	
AI Catch in CH	**18095.0**		**5794.9**		**3035.3**	
Weekly Average Catch	**3600/15wks**		**4717/9wks**		**2000/8wks**	

BSAI COD Status-quo - historic perspective
Initial Annual TAC (193,000 - 7.5% for CDQ) = 178,525

Sector	Sub Sector	Sector Allocation %	Sector TAC	Sub-sector Allocation	Sub-sector TAC	Historic % in CH	Historic % out CH	Projected Inside	Projected Outside
Trawl		47.0%	83,907						
	CV			50.0%	41,953	88.3%	11.7%	37,046	4,908
	C/P			50.0%	41,953	65.4%	34.6%	27,452	14,501
Jig		2.0%	3,571	100.0%	3,571	100.0%	0.0%	3,571	0
Fixed Gear		51.0%	91,048						
	Freezer LL			80.0%	72,838	25.9%	74.1%	18,883	53,975
	CV LL			0.3%	273	52.1%	47.9%	142	131
	Pot			18.3%	16,662	80.0%	20.0%	13,321	3,340
	CV <60 ft			1.4%	1,275	100.0%	0.0%	1,275	0
Total			178,525		178,525			101,670	76,855

CH "scorecard"

Amount (mt)		Percent of annual TAC		Limit	% Over	mt over
101,670	Amount in CH	56.9%	Percentage in CH	None	#VALUE!	#VALUE!
101,670	total amount in CH	56.9%	Total percentage in CH		#VALUE!	#VALUE!

BS COD Status-quo - historic perspective
Initial Annual TAC (165,000 - 7.5% for CDQ) = 152,625

Sector	Sub Sector	Sector Allocation %	Sector TAC	Sub-sector Allocation	Sub-sector TAC	Historic % in CH	Historic % out CH	Projected Inside	Projected Outside
Trawl		47.0%	71,734						
	CV			50.0%	35,867	88.2%	11.8%	31,627	4,240
	C/P			50.0%	35,867	40.5%	59.5%	14,527	21,340
Jig		2.0%	3,053	100.0%	3,053	100.0%	0.0%	3,053	0
Fixed Gear		51.0%	77,839						
	Freezer LL			80.0%	62,271	21.1%	78.9%	13,141	49,130
	CV LL			0.3%	234	21.8%	78.4%	51	183
	Pot			18.3%	14,244	77.7%	22.3%	11,069	3,176
	CV <60 ft			1.4%	1,090	100.0%	0.0%	1,090	0
Total			152,625		152,625			74,555	78,070

CH "scorecard"

Amount (mt)		Percent of annual TAC		Limit	% Over	mt over
74,555	Amount in CH	48.8%	Percentage in CH	None	#VALUE!	#VALUE!
74,555	total amount in CH	48.8%	Total percentage in CH		#VALUE!	#VALUE!

AI AI COD Status-quo - historic perspective
Initial Annual TAC (28,000 - 7.5% for CDQ) = 25,900

Sector	Sub Sector	Sector Allocation %	Sector TAC	Sub-sector Allocation	Sub-sector TAC	Historic % in CH	Historic % out CH	Projected Inside	Projected Outside
Trawl		47.0%	12,179						
	CV			50.0%	6,087	88.8%	11.2%	5,407	679
	C/P			50.0%	6,087	85.5%	14.5%	5,204	882
Jig		2.0%	518	100.0%	518	100.0%	0.0%	518	0
Fixed Gear		51.0%	13,209						
	Freezer LL			80.0%	10,567	83.1%	16.9%	8,780	1,787
	CV LL			0.3%	40	98.5%	1.5%	39	1
	Pot			18.3%	2,417	94.5%	5.5%	2,285	132
	CV <60 ft			1.4%	185	100.0%	0.0%	185	0
Total			25,900		25,900			22,419	3,481

CH "scorecard"

Amount (mt)		Percent of annual TAC		Limit	% Over	mt over
22,419	Amount in CH	86.6%	Percentage in CH	None	#VALUE!	#VALUE!
22,419	total amount in CH	86.6%	Total percentage in CH		#VALUE!	#VALUE!

Mr. Richard P. Lauber
North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, Ak. 99501-2253

Re: Agenda Items C-2

Dear Mr. Lauber,

Writing testimony at this time seems like an exercise in futility. Normally when I write testimony, my purpose is to convey an opinion, of persuade someone of the rightness or wrongness of some specific proposal, and enlist their assistance. But what is the point of testifying about C-2. What can you actually do about this particular agenda item?

We've been screaming for years that a groundfish train wreck was coming. No one familiar with the fisheries in the North Pacific is surprised at this present state of affairs. We have been asking for help to rationalize the pollock and p-cod fisheries in the Gulf for a long time. We have been asking the wrong people, we have been asking you. You can't rationalize these fisheries; you don't have the authority. NMFS can't rationalize the fisheries; they don't have the authority either.

If you pass more rules to further restrict the p-cod fisheries, what do you hope to accomplish? For years, industry as known that it had to slow down and spread out the fisheries. We have not succeeded. The judge lowered the boom on pollock and now incredibly, we are concentrating our fishing pressure more intensively than ever on smaller and smaller spots. Localized depletion? We are perfecting that term right now. Additional time and area closures for the p-cod fishery will take localized depletion to new high (low).

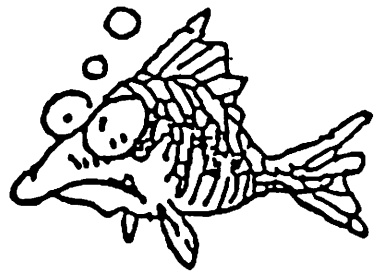
Various groups don't like rationalization schemes like IFQs and Co-ops, but it is time to either put up or shut up. IFQs and Co-ops offer the possibility of rational management of the fisheries. If there are other ways to accomplish, then let's start talking about them.

Don't waste anymore time writing more pointless rules that everyone knows cannot possibly help the industry or the environment. Don't spend any more time haggling about AFA sideboards. Instead, take this opportunity to address the situation effectively. Tell the congressional delegations that you need rationalization tools right now. Maybe they will be IFQs, Co-ops, Two pie, Community Fishing rights, who knows? But we need to start spending our resources designing a new way to manage our fishery, the present way is broken.

Best regards,

Joe Childers
Director
Western Gulf of Alaska Fishermen

North
Pacific
Longline
Association



Agenda C-2

August 31, 2000

Mr. Ricard B. Lauber, Chairman
North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, AK

RE: BSAI Pacific Cod/SSL

Dear Rick:

The North Pacific Longline Association represents freezer-longliners who are primarily dependent upon the cod fishery in the BSAI. We wish to offer the following comments on the Pacific Cod/Steller sea lion (SSL) issue:

An Exercise in Futility

We are of the firm belief that the NMFS Protected Resources Division is operating under a false premise - that food stress in SSL's is caused by fisheries competition for prey. Our captains report that the western population of killer whales has increased greatly over the last decade, and that the whales' aggressive predation on SSL's is responsible for the decline in their numbers. Pods of whales patrol just off haulouts and rookeries for days at a time. SSL's are afraid to enter the water, and thus suffer from hunger.

I have witnessed the results of this phenomenon several times. The whales approach the haulouts submerged, surfacing and blowing as they reach the rocks. The young SSL's jump into the ocean hoping for safety, while the mature ones retreat to the highest available refuge. The whales attack the juveniles, tossing them in the air as a cat plays with a mouse. They do not kill just for food, they kill all the juveniles, leaving a headless flotilla behind - no prisoners. The adult SSL's will remain high on the rocks for days - getting hungry. NMFS has reported an increase in the number of SSL pups this year, but they are unlikely to reach the age of three. Closing down cod fisheries to save SSL's is an exercise in futility.

The Perfect Fishery

Throughout this dubious exercise the Protected Resources Division has insisted that we create a cod fishery that is well dispersed in time and space, with minimal impact on critical

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habitat. The longline fishery for cod in the BSAI fits those criteria precisely. When there is enough cod available, the fishery lasts from January 1 to December 31 (please see Figure 13, attached). The fishery closes from mid-May to September because of poor product quality, low CPUE's; halibut bycatch, and endangered short-tailed albatrosse interaction. In terms of spatial dispersion, the fishery is prosecuted from the U.S. - Russian maritime boundary in the north to the Slime Banks in the east, and to Kiska Island in the west - a distance of perhaps 1,000 miles (please see attached chart). At any given time there are only 33-34 freezer-longliners in this vast area. Finally, longliner harvest within critical habitat is minimal (20% of catch in critical habitat - Draft EA, August 23, 2000, p. 40). It is difficult to imagine a fishery more dispersed in time and space, with less impact on critical habitat - in short, it is the perfect fishery for protecting SSL's.

No Localized Depletion/Critical Habitat

The linchpin of the Protected Resource Division's argument is that intense fishing causes "localized depletion," which means competition for prey: "Therefore, given the intense fishing pressure in critical habitat during the winter, and the preliminary analysis at hand, NMFS believes that localized depletions, resulting from fishing, are likely to be occurring." (Draft EA, p.49) The "preliminary analysis" of August 13, 2000 relates to trawling, as did the previous analyses of the Atka mackerel and pollock fisheries. The record does not suggest that longlining causes "localized depletion" in critical habitat, or anywhere else. Rather, the record is rife with suggestions to the contrary: "These figures indicate greater concentration of the trawl and pot fisheries in critical habitat compared to the longline fisheries, particularly in the BSAI region where the longline effort extends up the shelf break to the U.S. - Russian Convention Line." (BiOp 2000, p. 103); "In the BSAI...the longline fishery is well dispersed both temporally and and spatially." (BiOp 2000, p. 104) "The longline fishery occurs relatively dispersed throughout the winter and fall, mostly outside of critical habitat, with little catch occurring during the summer due to bycatch restrictions on the fishery...Longline catch is taken more outside of critical habitat and occurs mostly in winter and fall, with some limited catch in the later summer...The trawl and pot sectors average about 80% inside, while the longline sector only takes about 20% of it's catch inside." (Draft EA, p. 40)

The admisistrative record does not allege that the longline fishery for cod in the BSAI causes "localized depletion," inside or outside of critical habitat. It contains many statements, as above, that exculpate the fishery.

The Status Quo

The operative criterion in managing fisheries to conserve SSL's is "localized depletion" in critical habitat. Since the record does not suggest that BSAI longline fisheries for cod cause "localized depletion," there is no rational basis for changing the present regulations as they relate to longliners - the status quo should be left in effect. Taken by itself the fishery harvests only 24.8% of the BSASI cod TAC in the "A" season, 6.8% in critial habitat. It harvests only 15.7% of the BSAI cod TAC in the "B" season, 3.7% in critical habitat. Thus it fits easily within the footprint of Alternative 2.

"Fairness"

Inevitably it will be argued that it is "unfair" to allow the longline fisheries to continue in their traditional mode while modifying other fisheries. What is really unfair and even hypocritical is to set standards for a SSL-safe fishery, allow such a fishery to develop, and then treat it like any other fishery.

November-December Closure

The traditional BSAI longline cod fishery continues through November and December whenever the quota allows, and is conducted primarily outside of critical habitat. The fishery could be conducted entirely outside of critical habitat at that time of year. If the fishery is closed for November and December (or if our "A" season take is reduced) we will be forced to fish in the summer. This poses serious risks, the most extreme of which is taking short-tailed ablatrosses. There are some 1,300 of these birds in existence, nesting on an active volcano that has erupted violently five times since 1872. They feed heavily in the summer months. Additional problems are greatly increased halibut bycatch, lower CPUE's, and poor quality product. Closing the longline fishery during November and December makes no sense.

Aleutians Closure

Alternative 2 proposes to close ten-mile buffers around all SSL haulouts and rookeries in the Aleutians. A small number of longliners fish this area, which is some 300 miles in length. Typically there are four to six such vessels in the area, according to one of the operators (please see FIS charts, attached). They specialize in fishing for large cod for the salt cod market - "Eighty per cent of our catch is cod over twenty pounds." These fish are far larger than those sought by SSL's as prey. It is also noteworthy that longline gear aggregates cod rather than dispersing it. There may be more cod in a given area after a longliner fishes than before. There is no indication that this activity causes local depletion. Taken together these considerations make it clear that a closure of this area to longliners is illogical.

Halibut PSC

If the longliners' "A" season is curtailed and/or if the season is shortened at the end of the year, we will be forced into a summer fishery. To execute such a fishery we will need more halibut PSC.

Flexibility in Season Openings

For years the longliners have been asking for a regulatory amendment to allow flexibility in our season openings. If the above changes are made, this will become an absolute necessity.

General Considerations

It is our view that the proposed limitation of "A" season cod harvest to 40% for the BSAI, 20% in critical habitat, is too conservative. There are wall-to wall cod available to SSL's and fishermen in those areas during the winter; that is when harvest should be heaviest. We also support the use of critical habitat, not SCA in any management measures adopted.

Conclusions

We are engaged in a quixotic enterprise that will inflict great harm upon fishermen without any benefit to SSL's. It is a mistake to curtail cod fisheries in the manner proposed.

There are immense differences between the longline cod fishery and other cod fisheries - the longline fishery should continue to be managed separately. Since there is no showing in the record that longliners are causing "localized depletion," there is no rational basis for curtailing the fishery - it should be allowed to continue in its traditional manner. If the fishery is modified, care must be taken to address the November-December fishery, Aleutians closure, halibut PSC and season flexibility issues above.

Thank you for your attention.

Sincerely,

Thorn Smith

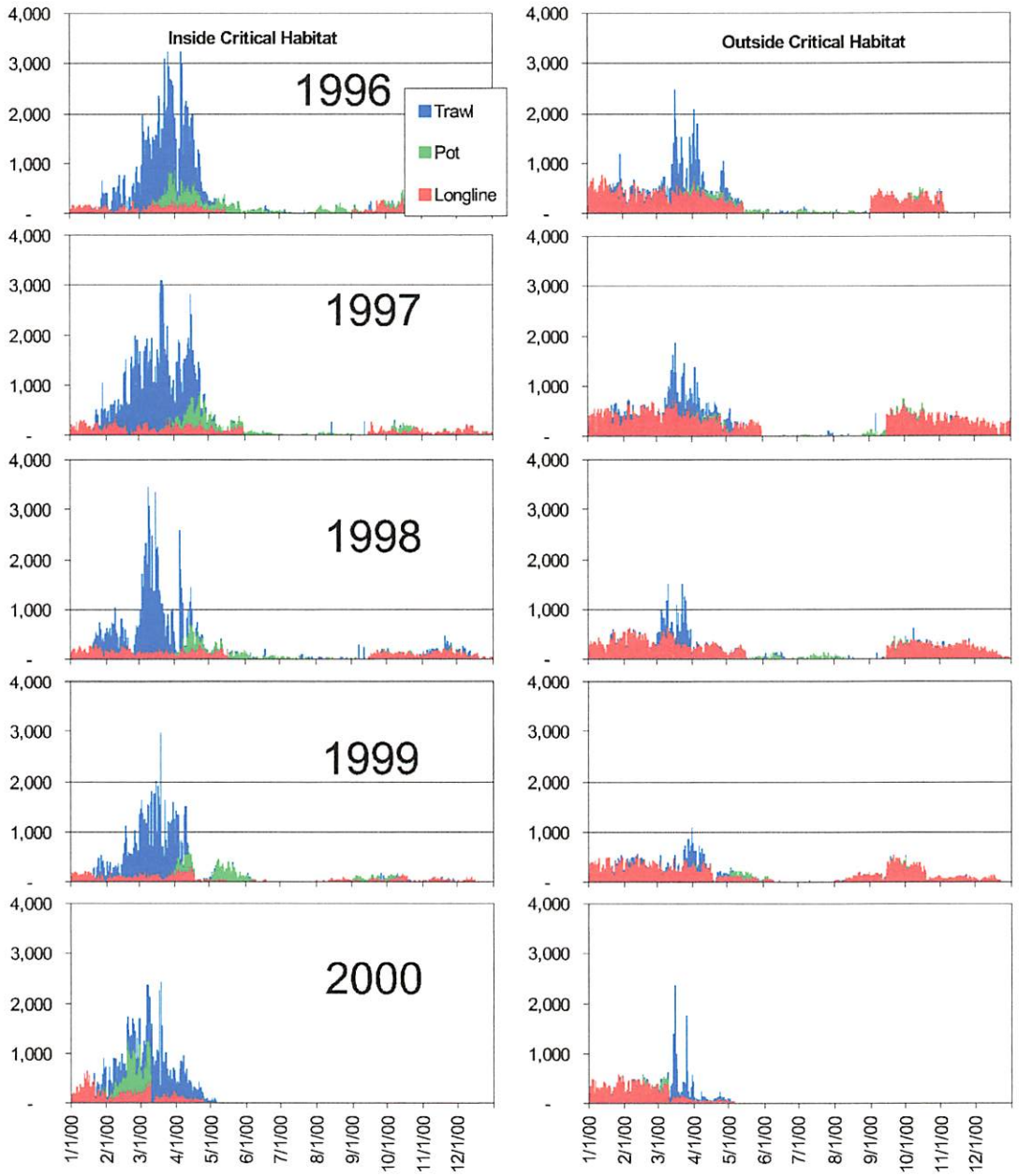
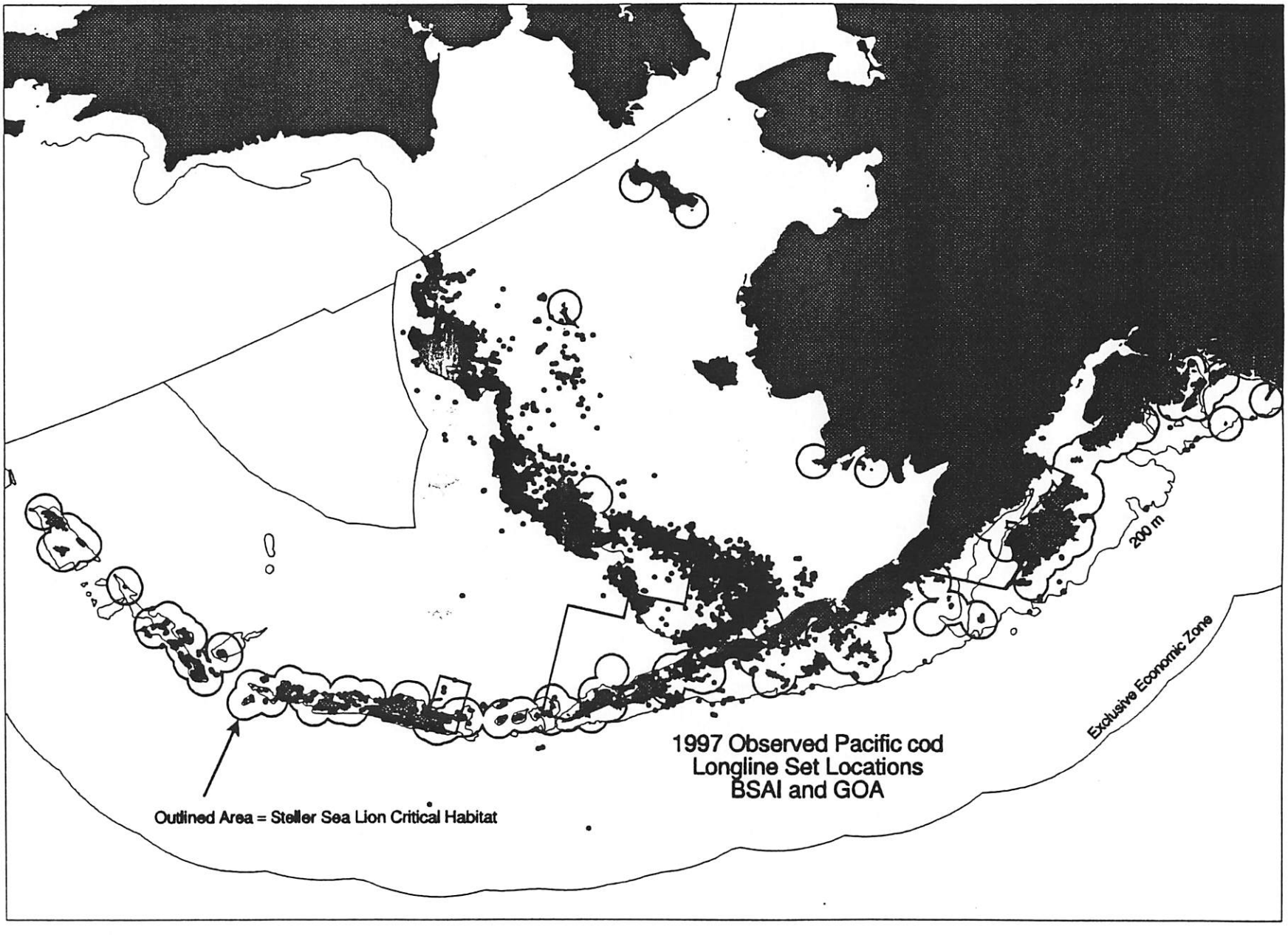
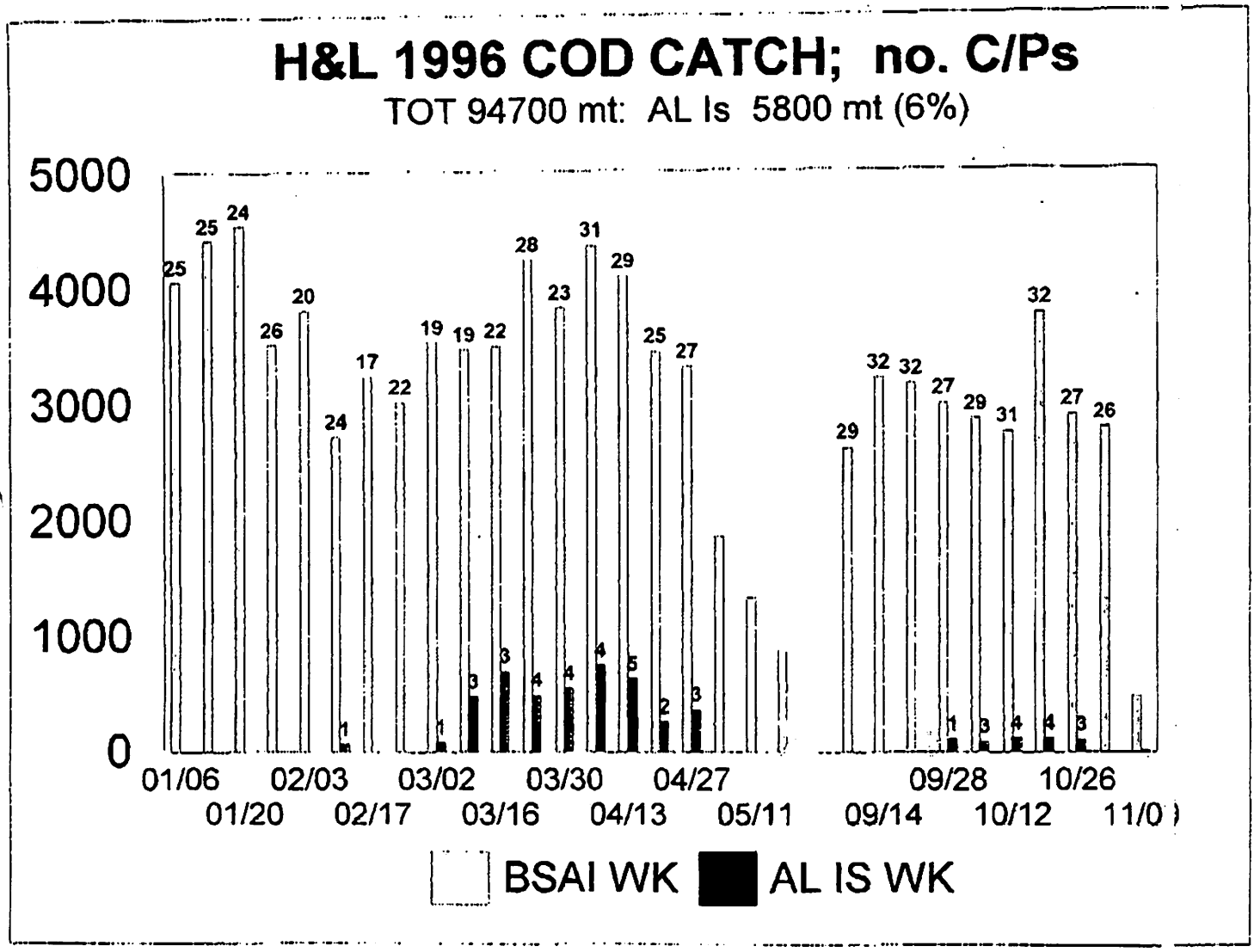
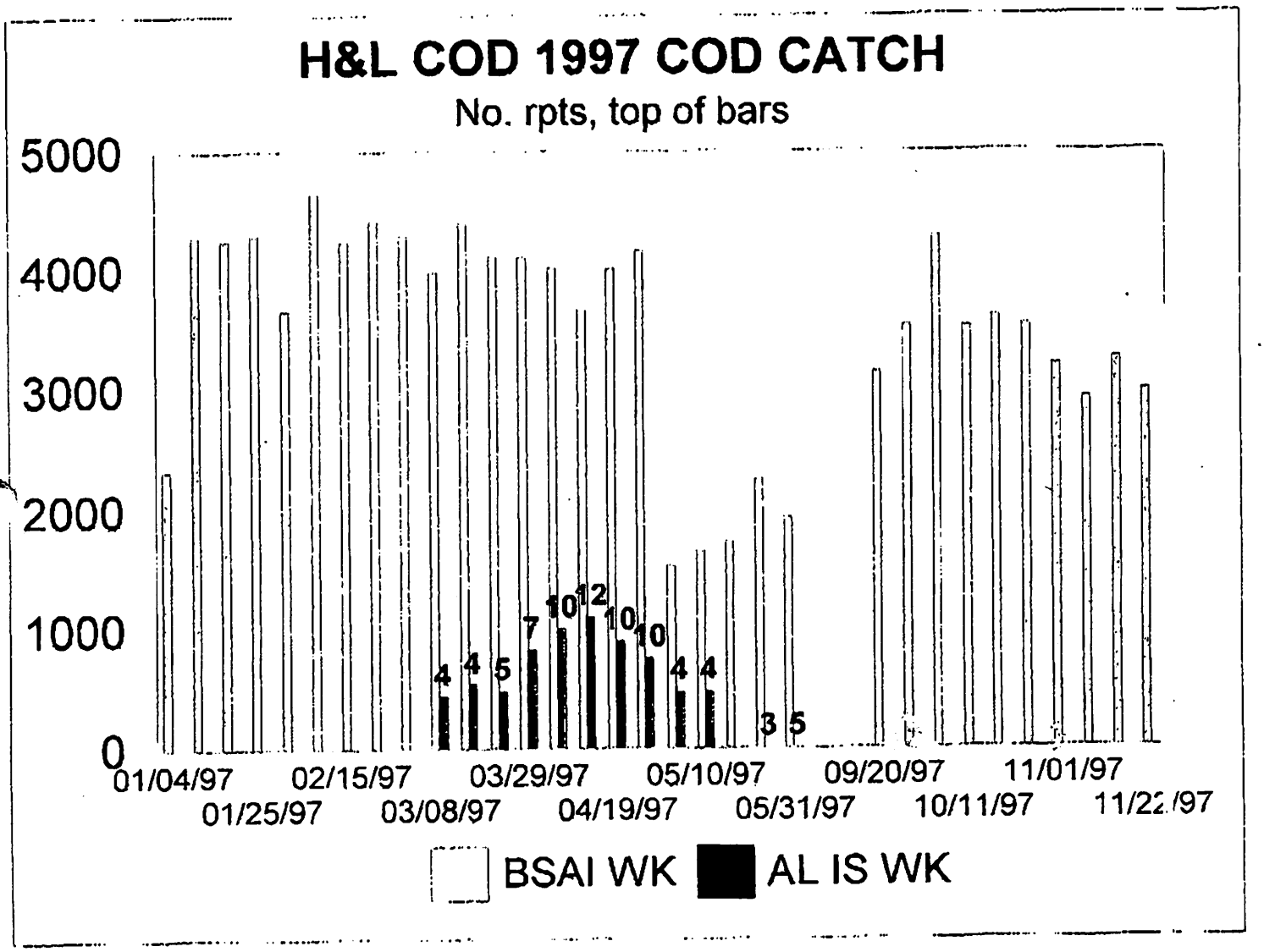
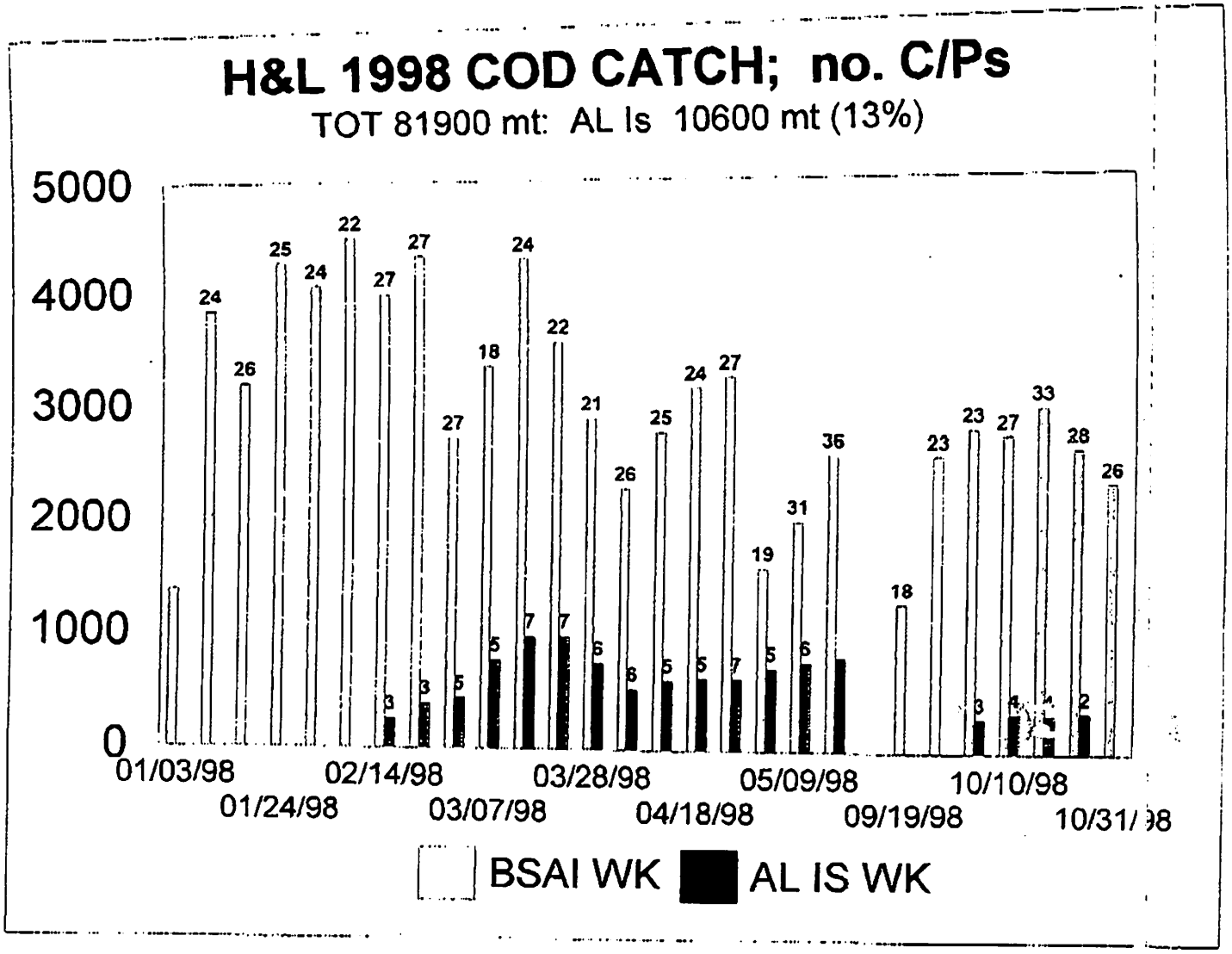


Figure 13. BSAI daily catch of Pacific cod by gear type inside and outside of Steller sea lion critical habitat from 1996-2000.

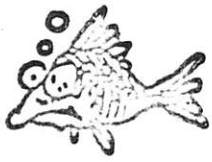

200 m
Exclusive Economic Zone
1997 Observed Pacific cod
Longline Set Locations
BSAI and GOA
Outlined Area = Steller Sea Lion Critical Habitat


H&L 1996 COD CATCH; no. C/Ps
TOT 94700 mt: AL Is 5800 mt (6%)
5000
4000
3000
2000
1000
0
01/06
01/20
02/03
02/17
03/02
03/16
03/30
04/13
04/27
05/11
09/28
09/14
10/26
10/12
11/0
BSAI WK
AL IS WK


H&L COD 1997 COD CATCH
No. rpts, top of bars
5000
4000
3000
2000
1000
0
4 4 5 7 10 12 10 10 4 4 3 5
01/04/97
01/25/97
02/15/97
03/08/97
03/29/97
04/19/97
05/10/97
05/31/97
09/20/97
10/11/97
11/01/97
11/22/97
BSAI WK
AL IS WK



I expect effort to decline in AL next 4 yrs.
So % will decline, maybe to 10%.



BRAD WARREN

No Cronyism

Should communities in the Gulf of Alaska be allowed to buy quota and lease it out "in perpetuity" to community members? The North Pacific Fishery Management Council will be accepting public comments on that proposal until September 15. A draft discussion paper is available from the council at www.fakr.noaa.gov/npfmc/Committees/Halibut/Issues/Halibut.htm

The idea of community-owned quotas has appeal. Who could condemn a plan to put fishing opportunity in the hands of people who were aced out of the resource that swims just beyond their docks? The same idea has worked in other arenas. For example, local housing authorities around the country provide affordable homes for low-income people. Could it work for fishing?

It might. The council's Advisory Panel has raised a number of questions about the proposal, but my main reservation concerns whether we're walking blindly into a problem that haunts public housing agencies: political favoritism. Like real estate, fishing rights are valuable enough to become exactly the kind of pork that local politicians will want to hand out to their campaign allies, their kin, and their cronies. If we're going to put fishing quotas into municipal hands, let's have safeguards to make sure cronyism doesn't determine who gets to fish them.

Pinhole of Hope

Greenpeace and its allies in the Steller sea lion lawsuit appear to be suffering from victor's remorse. Using the sword of the Endangered Species Act (ESA), they've won a federal court injunction that bans all trawling in waters designated as critical habitat for the Stellers. Ironically, their victory menaces the small-boat fishermen they had hoped to defend—or at least to be seen as defending.

Going into this fight, the environmentalists dreamed of slaying giant factory trawlers and championing not only sea lions but traditional harvesters who rely on the seas where they live. Trouble is, their lawsuit dropped the noose on people they want as allies: the small operators in the Gulf of Alaska. They now realize this. In fact, U.S. District Judge Thomas Zilly's injunction on July 19 interrupted the plaintiffs while they were negotiating with industry groups in a desperate attempt to slip their own noose off the little guys.

What went wrong? Well, the big boats can shift operations outside the nearshore waters that Judge Zilly shut. For them, the court-imposed closure will sting, but it won't be fatal. By most accounts, however, the results of this litigation are likely to bankrupt many small boats that depend on groundfish—especially in nearshore waters—for all or part of their income.

Under the injunction, skippers of the little trawlers that produce most of the Gulf of Alaska's groundfish catch now face a deadly choice: They can stay safe—and go broke—on the beach; that would also interrupt their catch history, risking their future fishing rights. Or else they can venture beyond 20 miles from shore, a dangerous undertaking for small boats in the rough-tempered Gulf, especially in winter. To protect their future, some will probably choose to fish farther offshore than they can safely operate, especially when heavily loaded with pollock.

If somebody dies doing this, Greenpeace and its allies may have trouble holding onto their victory. The backlash from angry fishing communities in the Gulf could give Congress the courage (or the pretext) to rewrite the ESA. That could undermine the string of triumphs that environmental litigators have racked up around the country.

Quivering in fear of further legal attacks from environmentalists, the National Marine Fisheries Service has drafted regulations for cod fishing that promise to clobber not only trawlers but everybody else—including even freezer-longliners in the Bering Sea cod fishery. It would be hard to conjure up a fishery that poses less risk to Steller sea lions, even if you accept the questionable theory of "localized depletion," which is the biological linchpin of this whole dispute. Trawlers and pot boats take most of their cod during brief, intense fisheries within the Stellers' designated critical habitat; but the longliners take most of theirs outside those waters, and their catch is distributed evenly over four to eight months.

Can Greenpeace & Company avoid wrecking the people they hoped would hail them as heroes? Can Gulf fishing communities survive? Maybe. It's a slim chance, but the only hope is for decision-makers at NMFS to seize the opportunity now to demonstrate that, contrary to recent appearances, they are not invertebrates. Judge Zilly's injunction was really intended to force the agency to clean up its feckless and shoddy—but legally required—report on the groundfish fisheries' impacts on sea lions. To do that, NMFS must now assemble a comprehensive and rigorous review of the science on fishery interactions with sea lions. Though the judge hasn't said so, it's obvious that the agency should also submit the disputed theory of localized depletion, which is based on only one study, to peer review and field testing so that it can be firmly verified or refuted.

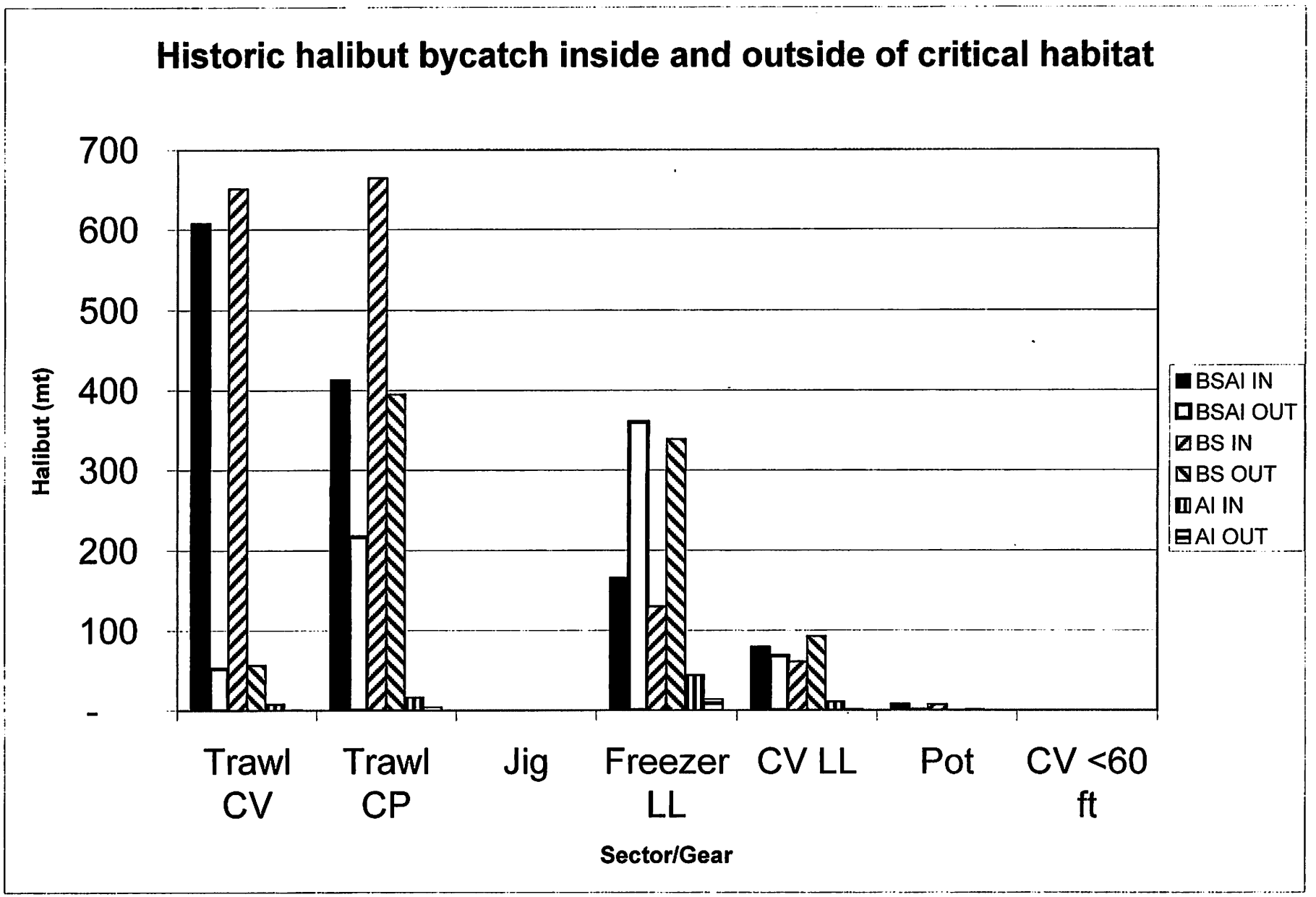
Given an acceptable environmental review, Zilly could lift the injunction and open up a fresh round of negotiations over how fishing can best be managed to protect the endangered mammals. That would be a welcome turn. A negotiated fix won't be ideal for anyone, but it might be better than the fiasco we all face today.

—Brad Warren, Editor

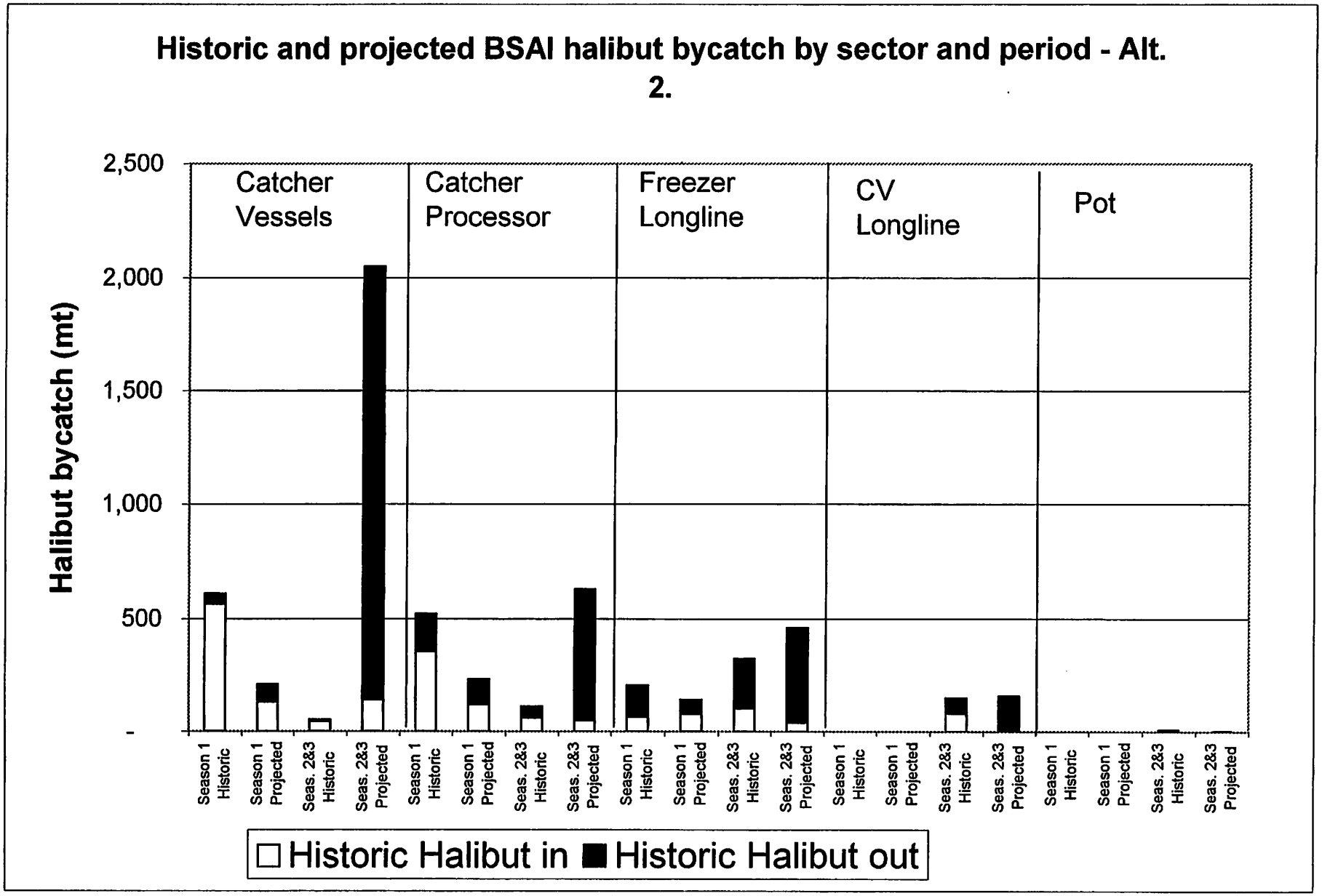
Coming in October:

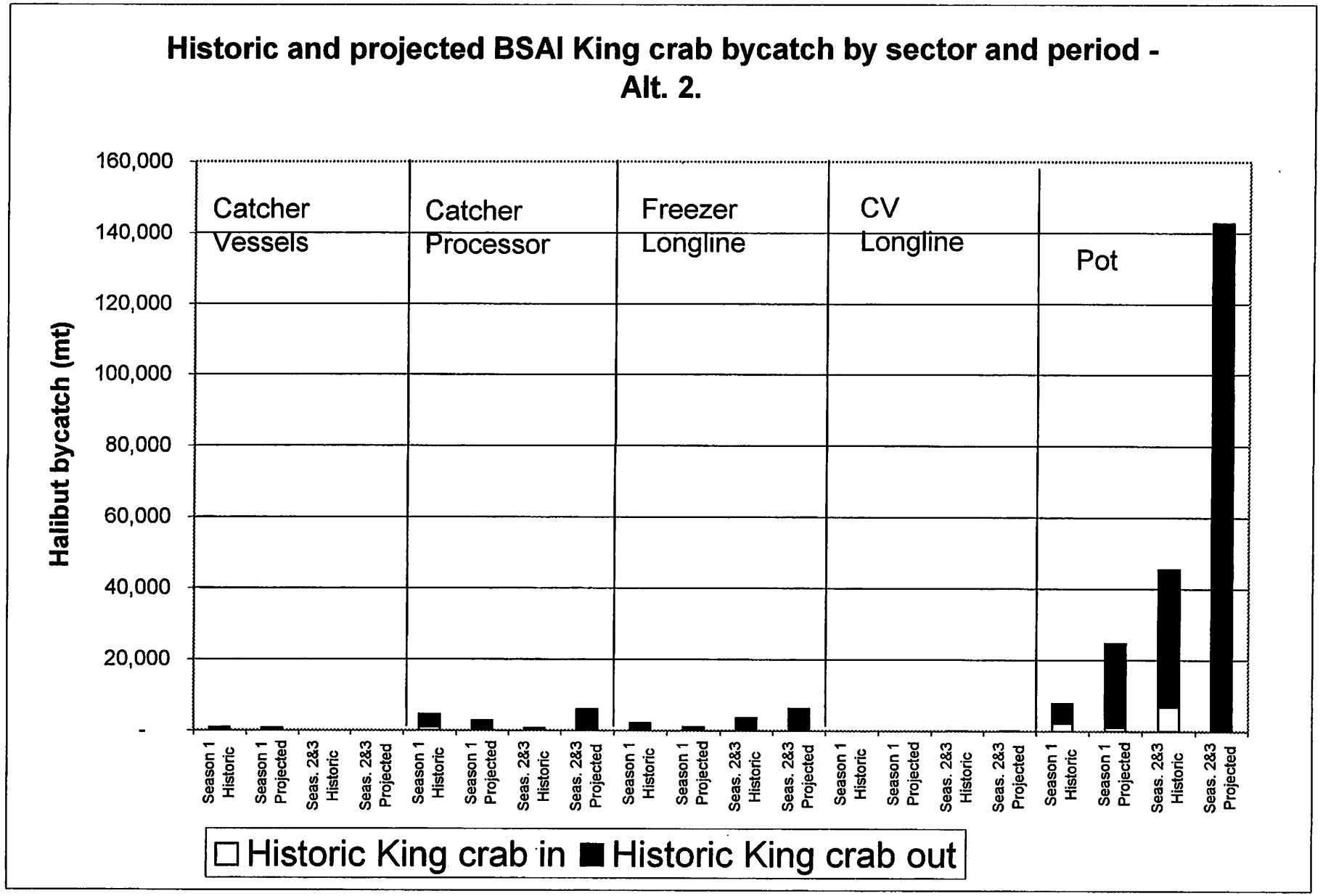
CRAB OUTLOOK Hard times are forcing the crab industry to redefine itself. When the dust settles, what will the fleet look like? Is there a rebound coming?

Trawl Focus: A look at trawl monitoring systems, and a study to determine how trawling affects the seabed.

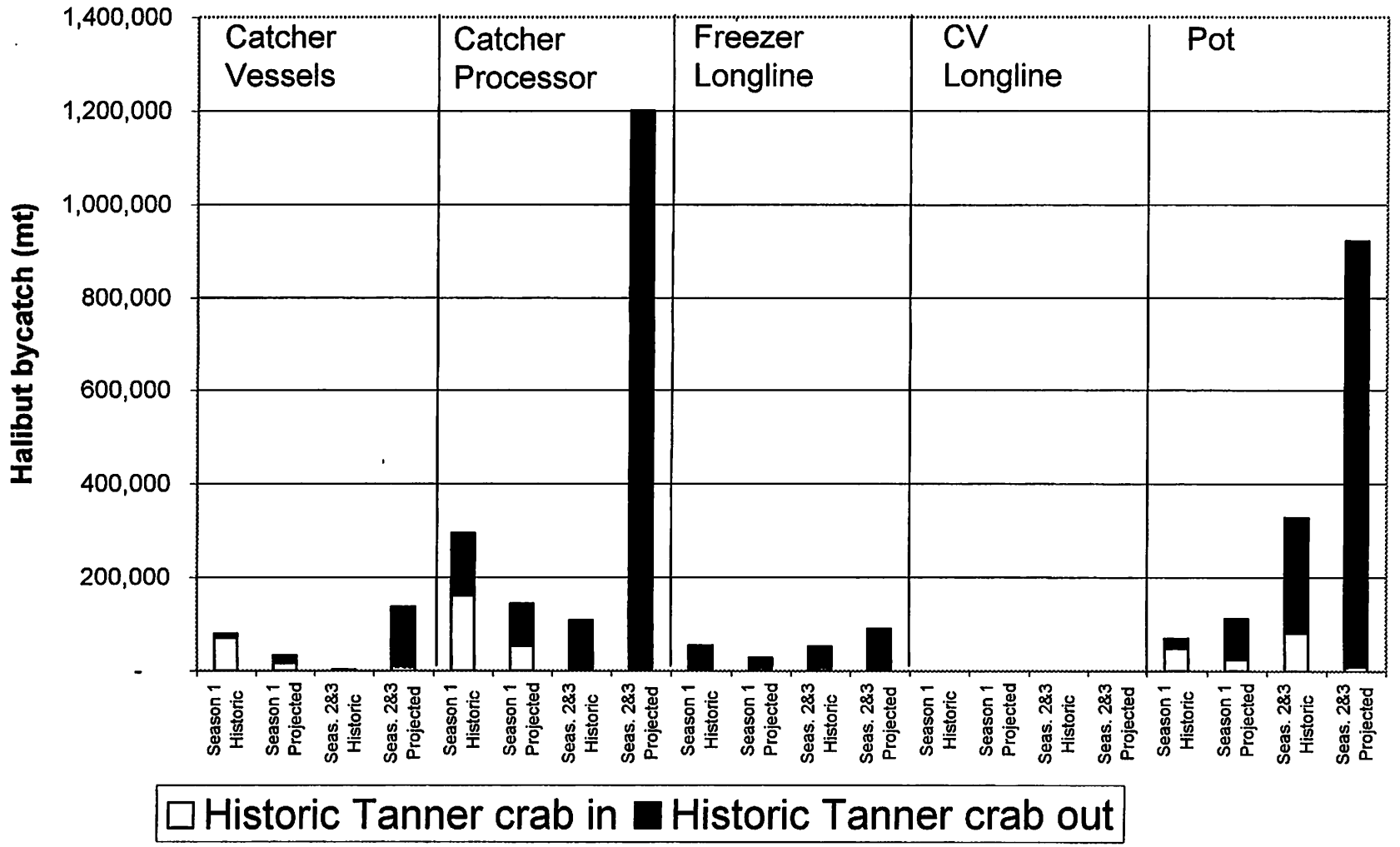


Dave Ackley's

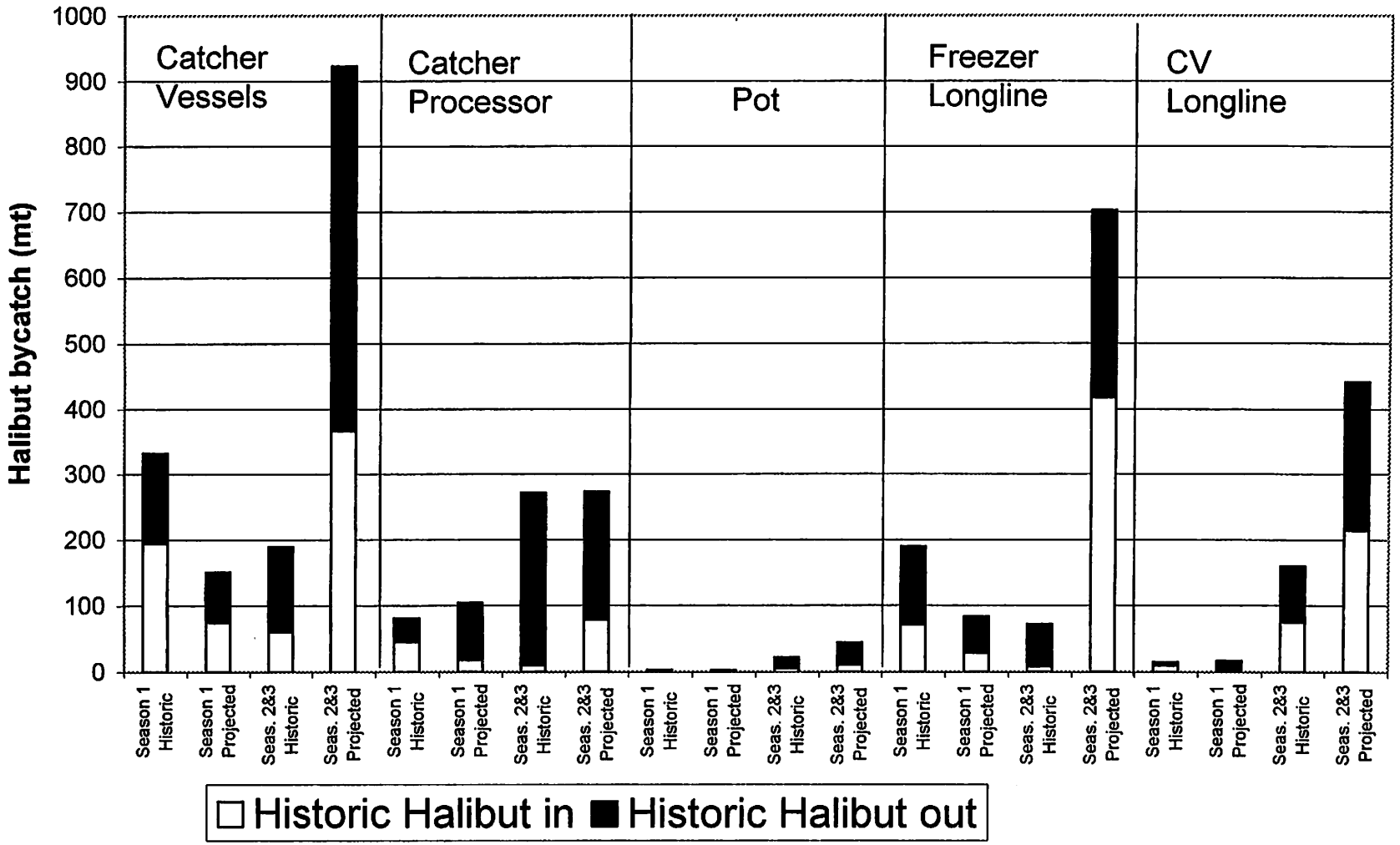

Historic and projected BSAI halibut bycatch by sector and period - Alt. 2.
Halibut bycatch (mt)
2,500
2,000
1,500
1,000
500
-
Catcher Vessels
Catcher Processor
Freezer Longline
CV Longline
Pot
Season 1 Historic
Season 1 Projected
Seas. 2&3 Historic
Seas. 2&3 Projected
Historic Halibut in
Historic Halibut out


Historic and projected BSAI King crab bycatch by sector and period - Alt. 2.
Halibut bycatch (mt)
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
-
Catcher Vessels
Catcher Processor
Freezer Longline
CV Longline
Pot
Season 1 Historic
Season 1 Projected
Seas. 2&3 Historic
Seas. 2&3 Projected
Historic King crab in
Historic King crab out

Historic and projected BSAI Tanner crab bycatch by sector and period - Alt. 2.

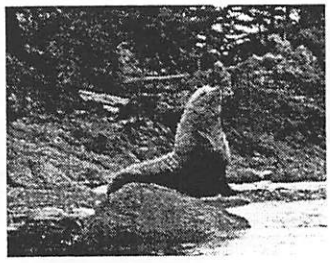


Historic and projected GOA halibut bycatch by sector and period - Alt. 2.



KRISTIN MABRY ADF&G

Potential Interactions between State-managed Pacific Cod Fisheries and Steller Sea Lions



Kristin R. Mabry
Alaska Department of Fish & Game
Division of Commercial Fisheries
Juneau, Alaska

Presentation Outline

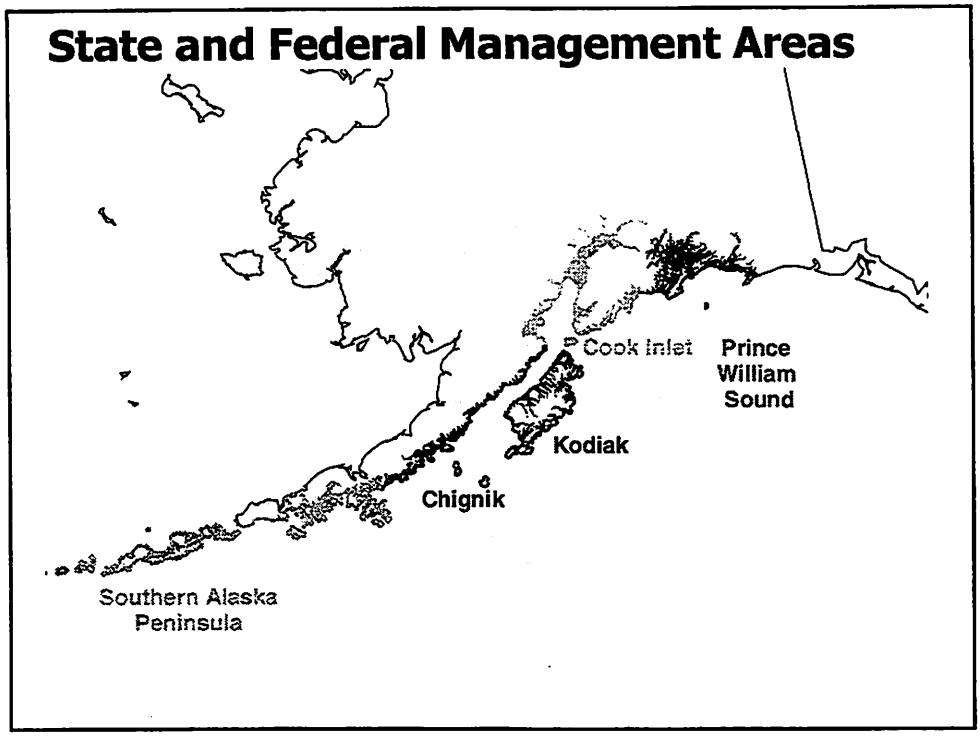
- Definition of parallel and state-managed fisheries
- Overview of state fishery management plans
- Summary of state-managed fisheries
- Relationship of state-managed fisheries to Steller sea lion (SSL) critical habitat
- Coordination of federal and state actions for greater SSL protection

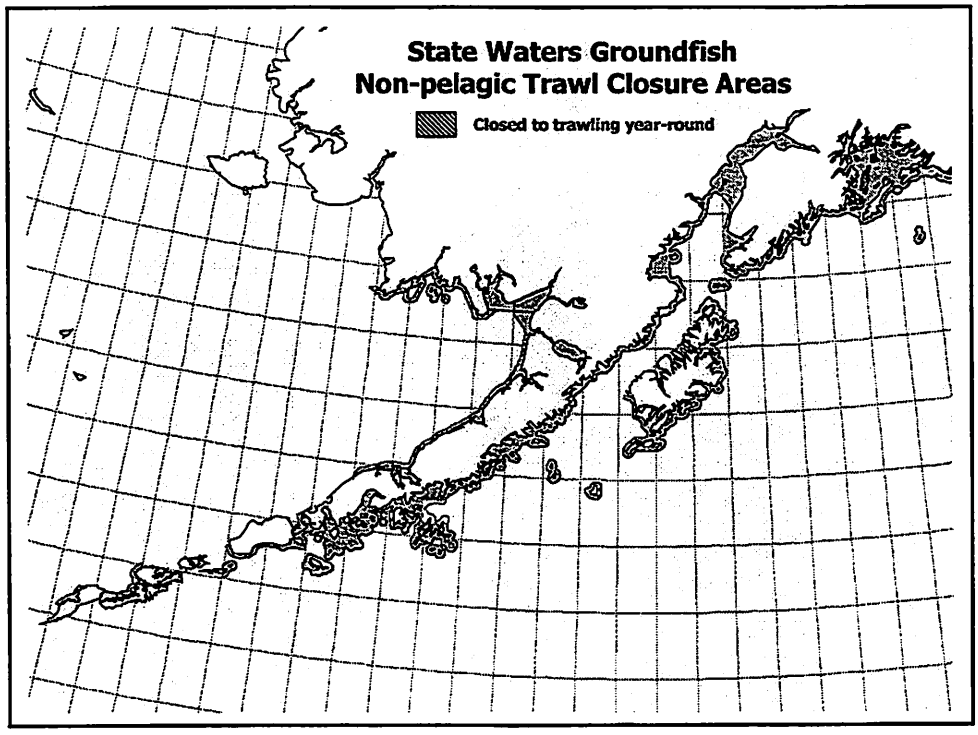
Parallel Fishery

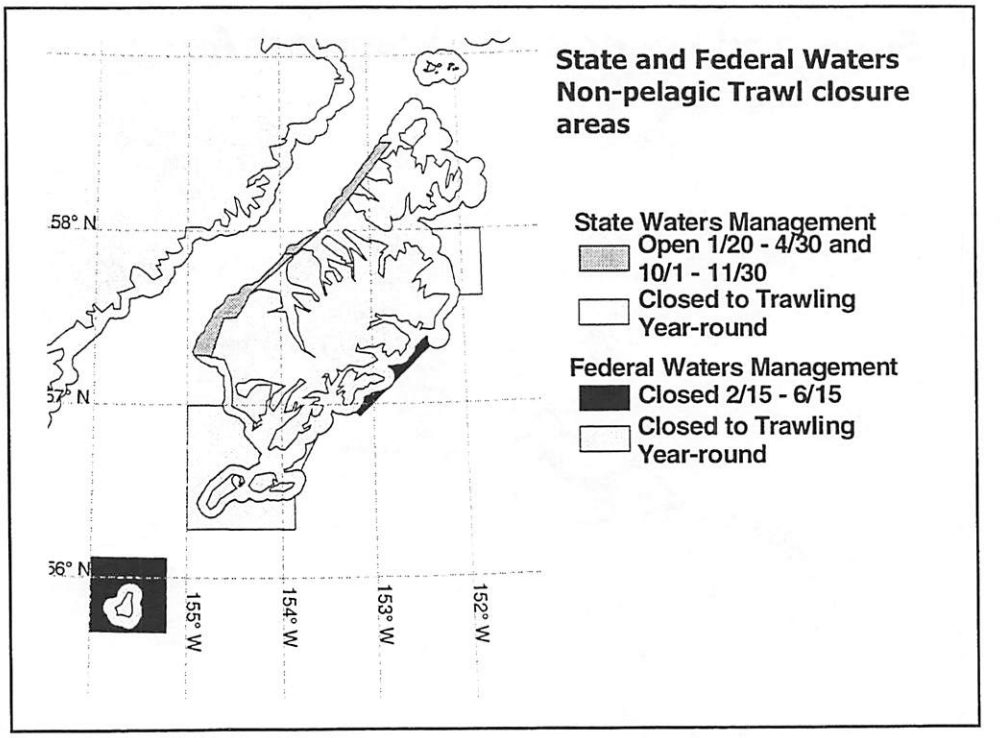
- FMPs adopted by NPFMC, fishery managed by NMFS
- 75% (or more) of GOA TAC
- Trawl, longline, pot, and jig
- Starts January 1 (January 20 for trawl)
- Both in and out of state waters
- Most state waters closed year-round to non-pelagic trawl

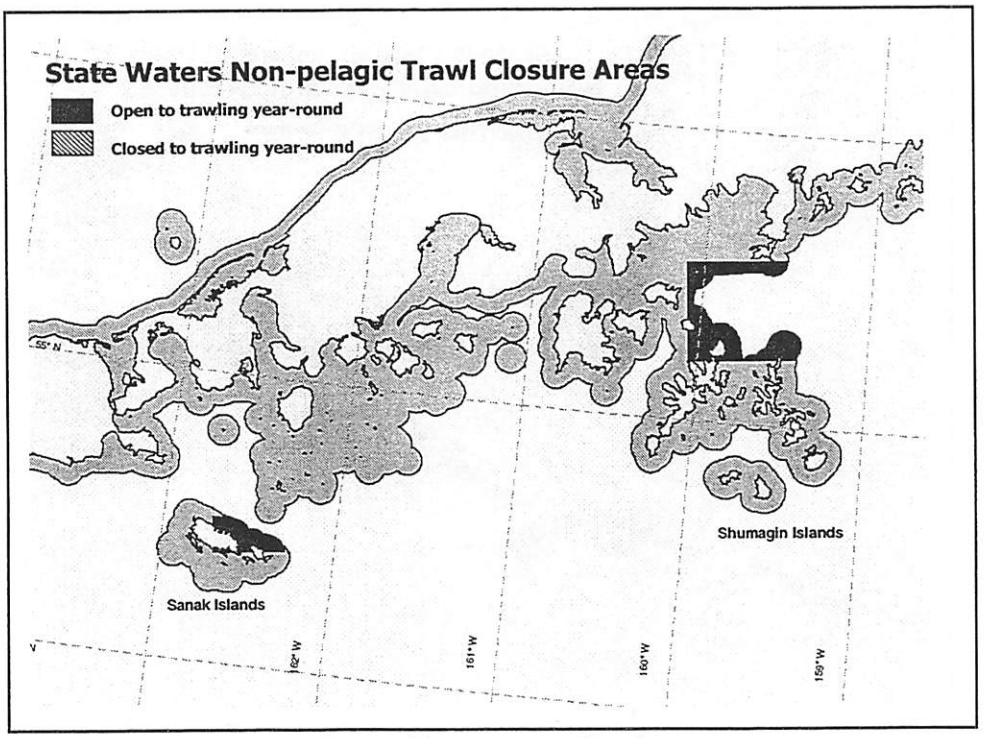
State-managed fishery

- Up to 25% TAC
- Pot and Jig gear only
- Starts after the parallel fishery ends
- FMPs adopted by BOF for PWS, Cook Inlet, Chignik, Kodiak, and South Alaska Peninsula in 1996, implemented in 1997. Fisheries managed by ADF&G.


State and Federal Management Areas
Cook Inlet
Prince William Sound
Kodiak
Chignik
Southern Alaska Peninsula


State Waters Groundfish
Non-pelagic Trawl Closure Areas
Closed to trawling year-round


State and Federal Waters
Non-pelagic Trawl closure areas
State Waters Management
Open 1/20 - 4/30 and 10/1 - 11/30
Closed to Trawling Year-round
Federal Waters Management
Closed 2/15 - 6/15
Closed to Trawling Year-round
58° N
56° N
155° W
154° W
153° W
152° W


State Waters Non-pelagic Trawl Closure Areas
Open to trawling year-round
Closed to trawling year-round
Shumagin Islands
Sanak Islands
161° W
160° W
159° W

State Pacific Cod FMPs (Fixed Management Measures)

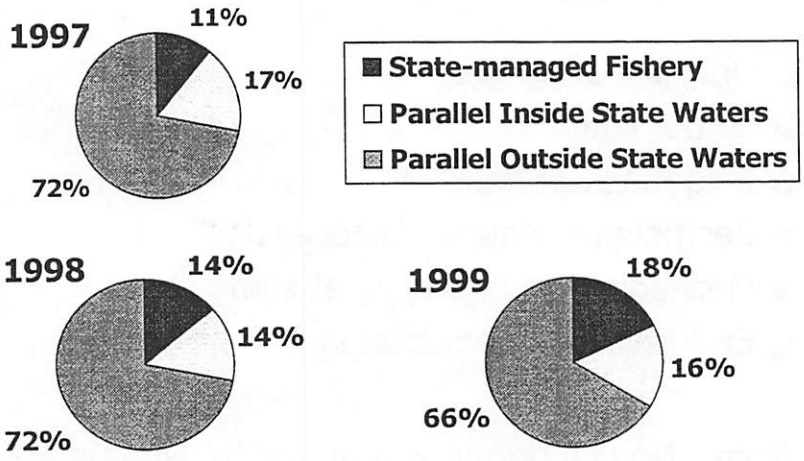
- Only pot or jig gear
- 60 pot limit
- 5 jig machine limit
- Restrictions reduced October 31st
- Mechanical and hand jig at same time
- Exclusive area registration

Note: No LLP permit is required to fish in state-managed fishery.

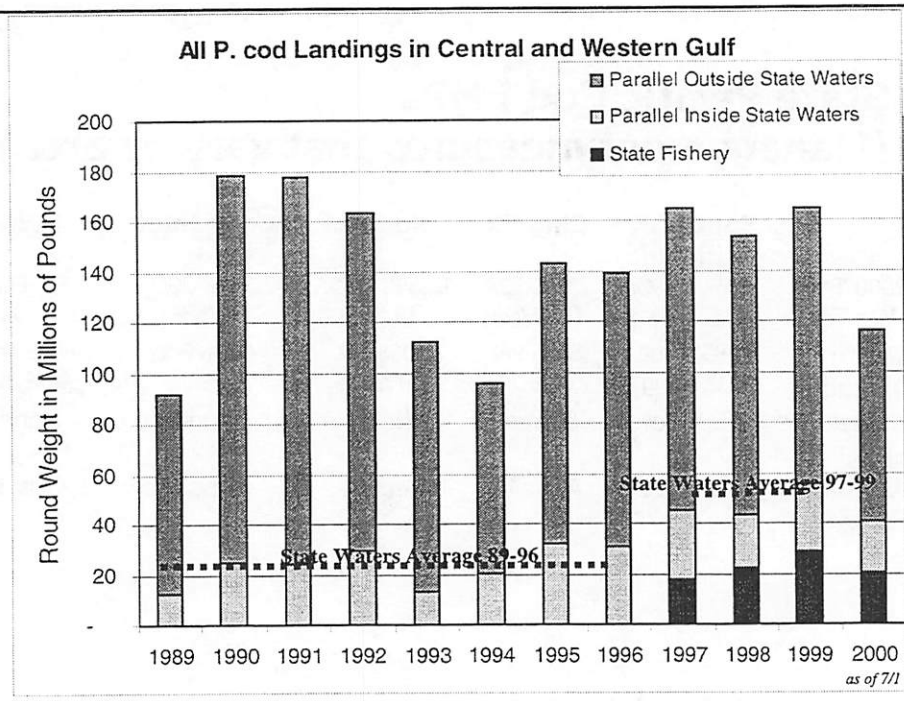
State Pacific Cod FMPs (Management measures that vary by area)

	South AK Peninsula	Chignik	Kodiak	Cook Inlet	PWS
2000 TAC (Max TAC)	25% WGOA (25%)	7% CGOA (8.75%)	12.5% CGOA (12.5%)	2.25% CGOA (3.75%)	25% EGOA (25%)
Gear Allocation	85%Pot 15% Jig	85% Pot 15% Jig	50% Pot 50% Jig	50% Pot 50% Jig	60% Pot 40% Jig
Vessel Size Limit	58 feet	58 feet	None	None	None
Allocation Rollover	Oct. 31	Aug. 15	Sept. 1	Sept. 1	Oct. 1

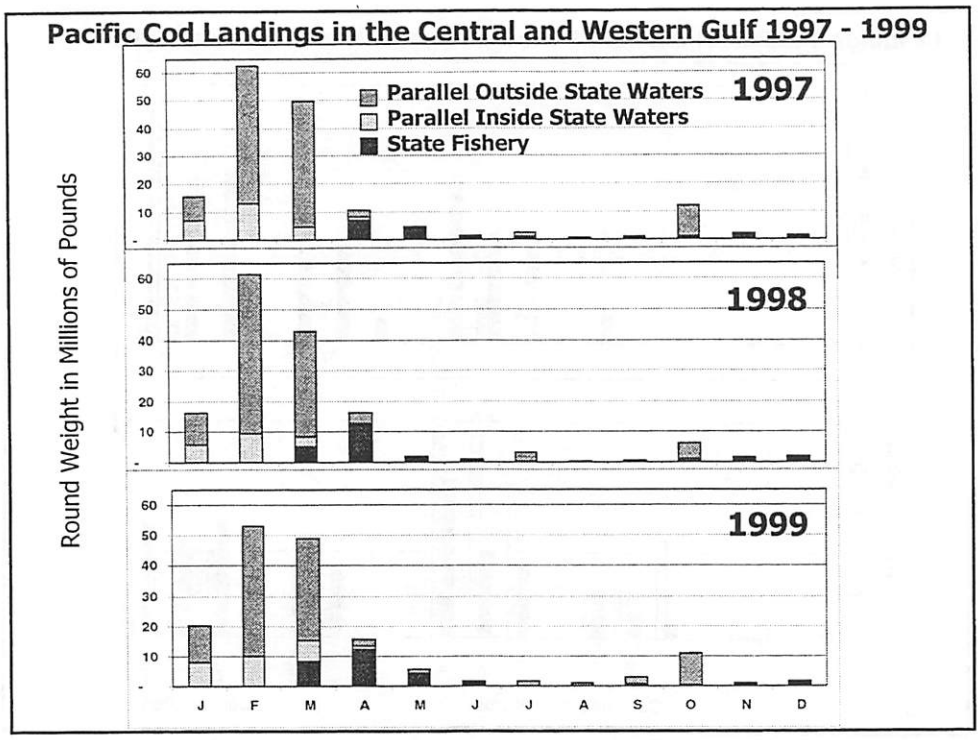
Cod Landings in the Central and Western GOA 1997 - 1999 by Fishery

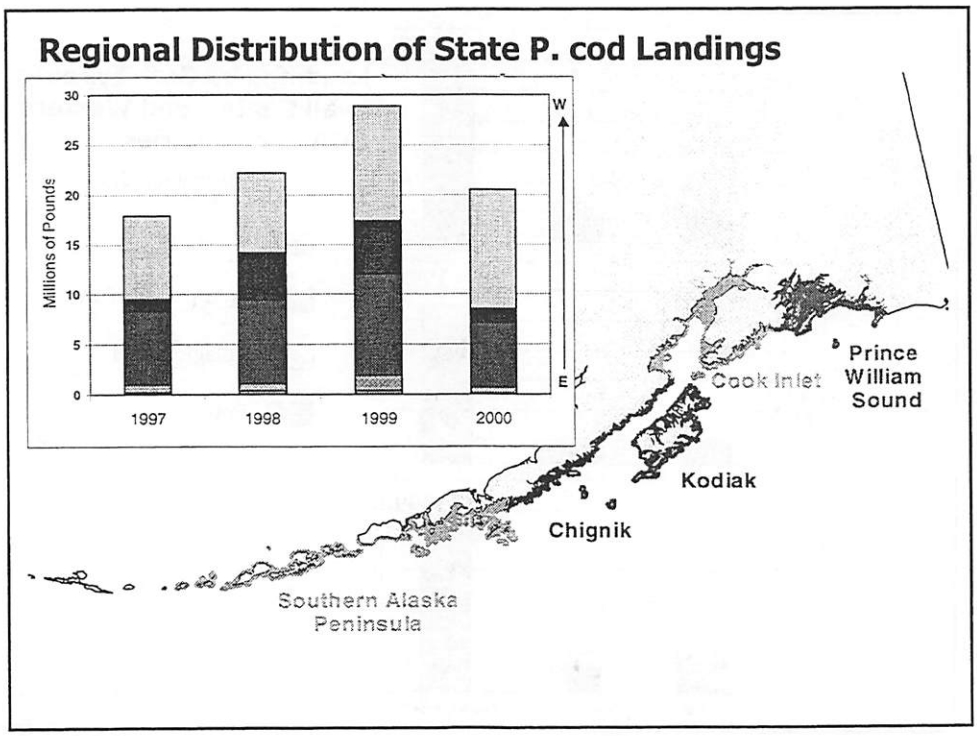


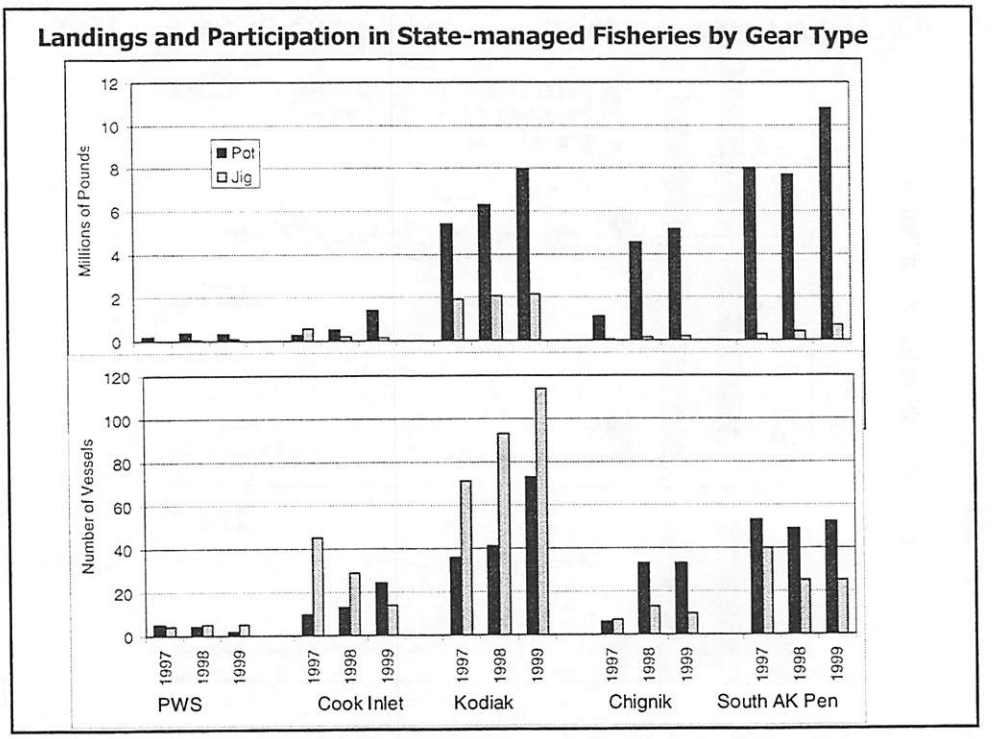
Note: Landings data do not include catches processed offshore without fish ticket records.

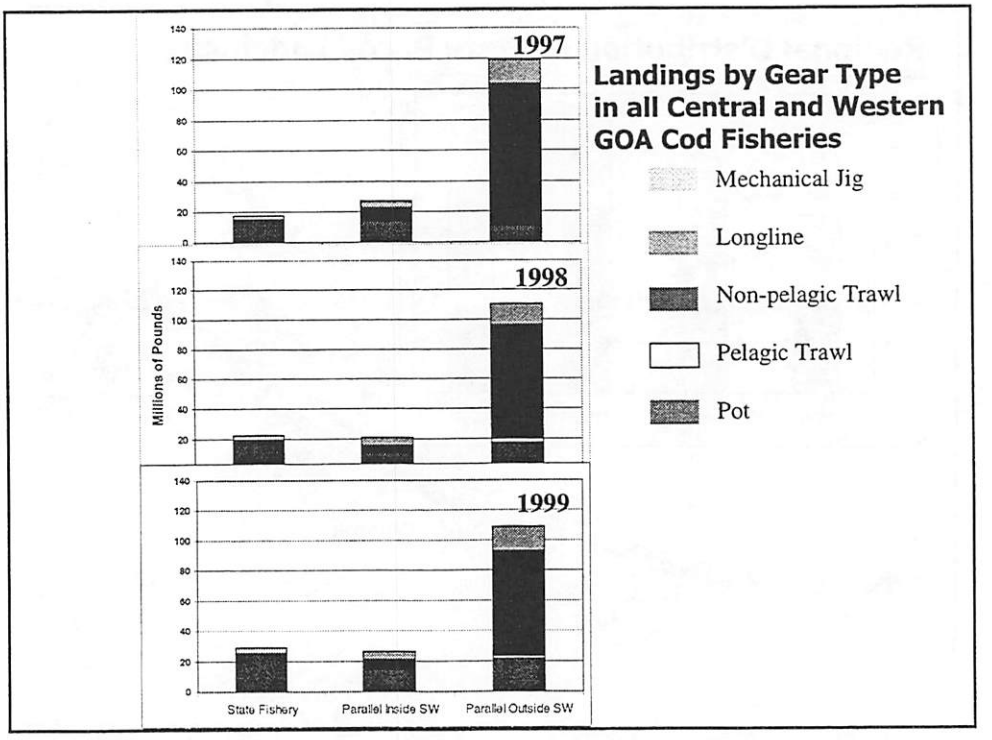


Note: Landings data do not include catches processed offshore without fish ticket records.

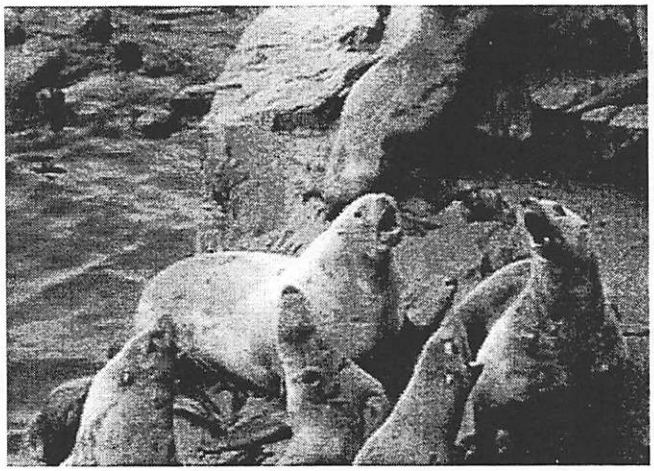

Pacific Cod Landings in the Central and Western Gulf 1997 - 1999
Round Weight in Millions of Pounds
Parallel Outside State Waters
Parallel Inside State Waters
State Fishery
1997
1998
1999
60
50
40
30
20
10
-
J F M A M J J A S O N D


Regional Distribution of State P. cod Landings
Millions of Pounds
30
25
20
15
10
5
0
W
E
1997
1998
1999
2000
Prince William Sound
Cook Inlet
Kodiak
Chignik
Southern Alaska Peninsula


Landings and Participation in State-managed Fisheries by Gear Type
Millions of Pounds
Pot
Jig
Number of Vessels
1997
1998
1999
PWS
Cook Inlet
Kodiak
Chignik
South AK Pen

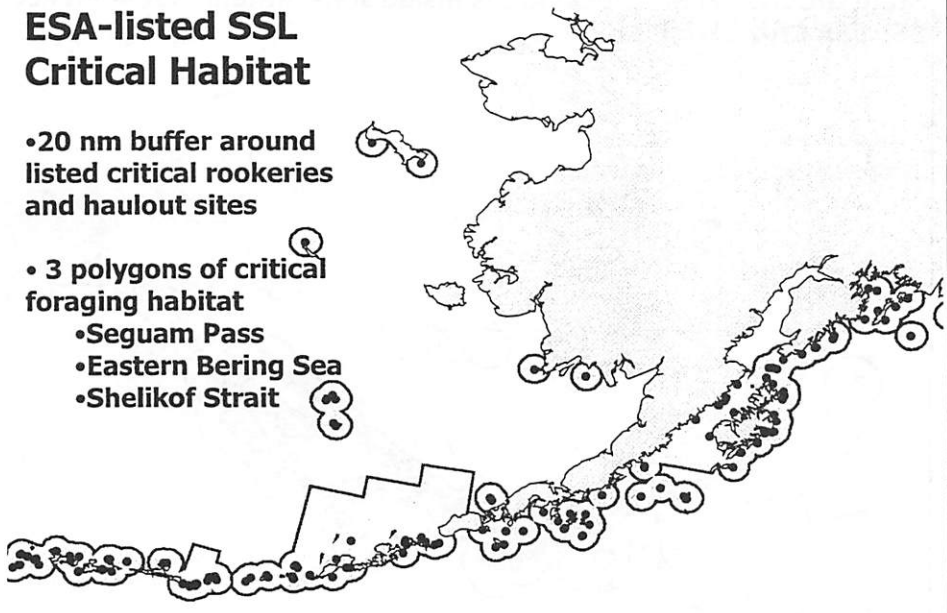

1997
1998
1999
Millions of Pounds
Landings by Gear Type in all Central and Western GOA Cod Fisheries
Mechanical Jig
Longline
Non-pelagic Trawl
Pelagic Trawl
Pot
State Fishery
Parallel Inside SW
Parallel Outside SW

Relationship of State-managed Fishery to Sea Lion Critical Habitat



ESA-listed SSL Critical Habitat

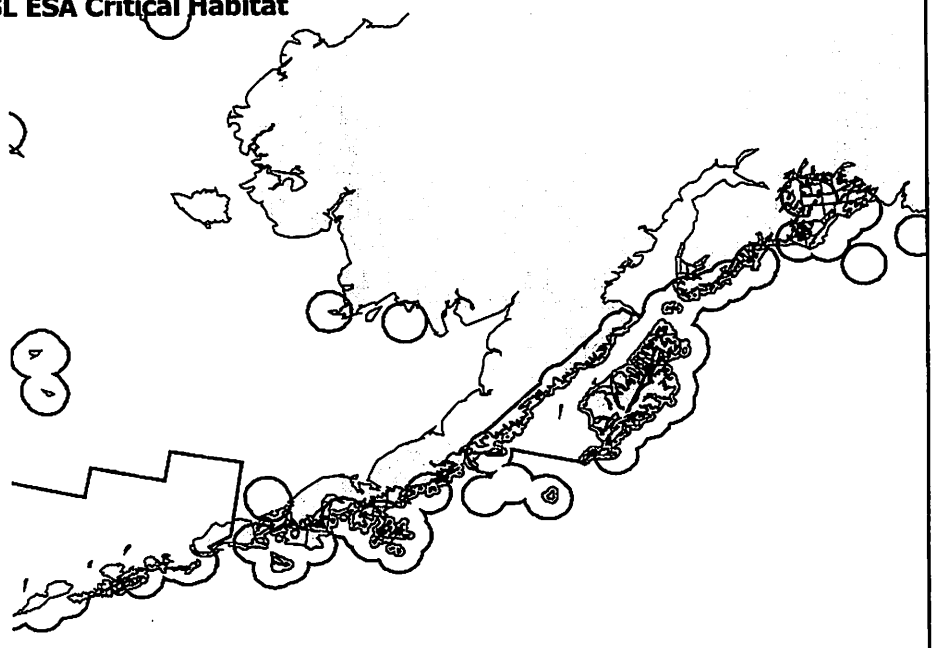
- 20 nm buffer around listed critical rookeries and haulout sites
- 3 polygons of critical foraging habitat
  - Seguam Pass
  - Eastern Bering Sea
  - Shelikof Strait



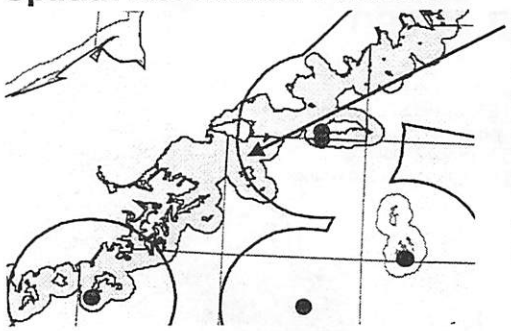
Methods

- Queried fish ticket database for all cod landings in the Gulf of Alaska
  - Finest spatial resolution recorded is statistical area
- Coded landings for State or Federal TAC
  - State TAC – only directed pot and jig fisheries
    - Only during state-managed fishery open dates by region
    - Only pot and jig gear
    - Only inside state waters
  - Federal TAC – everything else
- Intersected state groundfish stat areas with SSL critical habitat

State Groundfish Statistical Areas inside state waters that intersect SSL ESA Critical Habitat

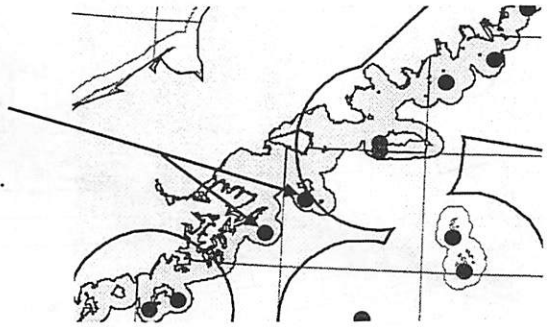


Spatial Resolution Problem

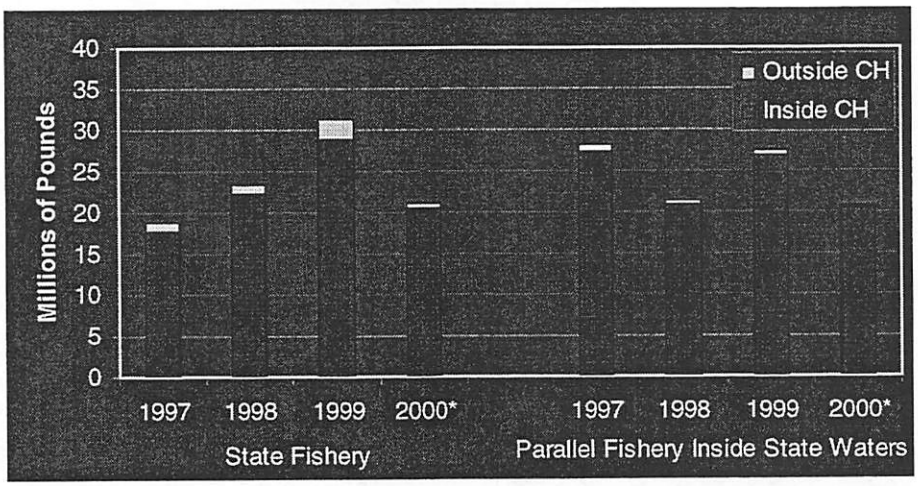


Some statistical areas fell only partially inside SSL ESA designated critical habitat. Because catch is only recorded to the stat area, all catch in statistical areas which intersected any critical habitat is considered inside critical habitat. This results in an overestimation of the percentage of catch inside ESA-defined critical habitat.

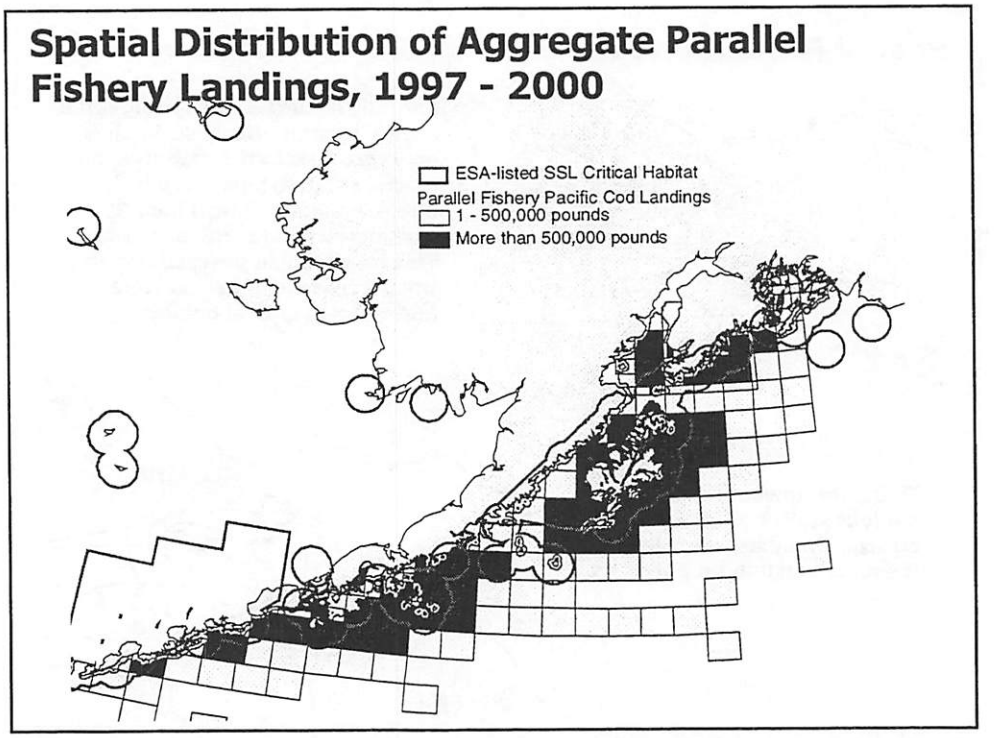
There are however other SSL haulout sites, not ESA-listed critical, that exist outside these critical habitat polygons.



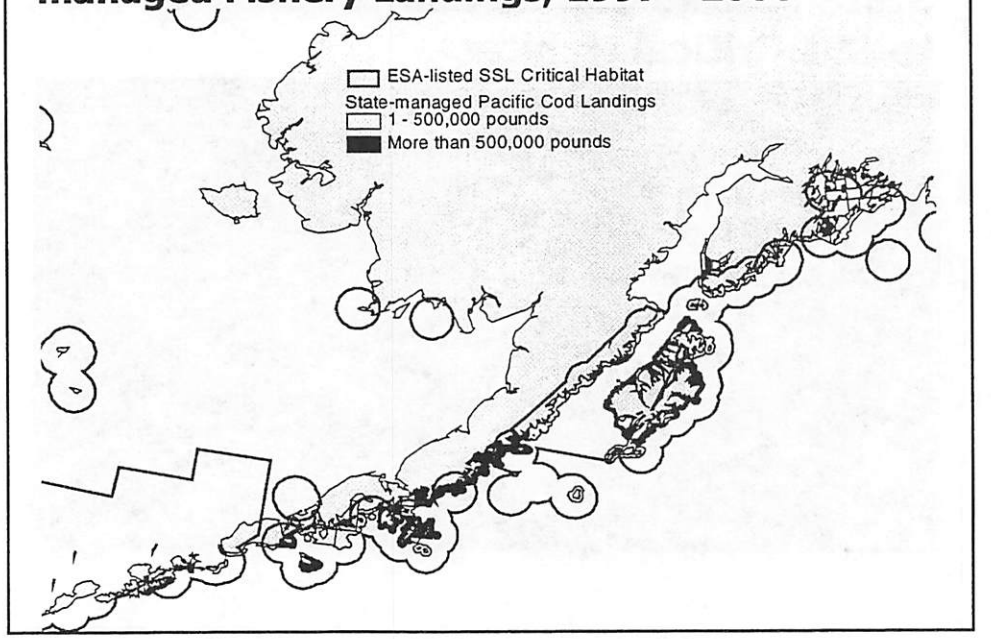
State Waters Cod Landings Relative to SSL Critical Habitat



Spatial Distribution of Aggregate Parallel Fishery Landings, 1997 - 2000



Spatial Distribution of Aggregate State-managed Fishery Landings, 1997 - 2000



Do State-managed Fisheries affect SSL?

Issues to Consider:

•Competition for prey may exist between the fishery and SSL
•Fishing during sensitive SSL feeding periods in late winter and early spring
•Spatial overlap of fishery and SSL critical habitat as defined by NMFS

Unanswered Questions:

•Do cod catches affect SSL nutrition, esp. during critical foraging periods?
•Do some or all gear types cause localized depletions of SSL prey?
•Do some or all gear types compromise habitats that are critical to SSL?

Precautionary Measures Currently in Place:

•Non-pelagic trawl closures areas protect bottom habitat and other SSL prey
•Fixed gear may reduce prey competition by selecting for larger cod
•State-managed catch is a small portion of total removals (11%-18%)
•Slow harvest rates help to distribute state-managed catch throughout year into non-critical feeding periods

Likely Timetable for Coordinated Federal and State Actions

Federal Action:

- Week of September 7th -- NPFMC may recommend Pacific cod EA for public review
- Week of October 2nd -- NPFMC may take action on federally-managed Pacific cod fisheries

State Action:

- September 29th -- BOF subcommittee advises full BOF about the need for possible action
- October 2nd -- BOF may initiate 30-day BOF public notice
- November 2nd -- BOF considers the need for possible actions on the parallel fishery in state waters and the state-managed cod fishery

BEN MUSE
C-2

Status Quo or Baseline for Pacific cod-Stellar analysis

September 2000
Ben Muse

Outline:

- Estimating catch in critical habitat
- Gulf of Alaska (GOA)
- Bering Sea and Aleutians (BSAI)

Estimating catch in critical habitat

Data used

- Blend
  - WPR data and
  - Observer reports
  - combined to produce estimates of total catch
- Observer reports
  - used, in addition, to for information on harvest location

Three classes of vessel

- Different observer coverage for different vessels
- Three vessel classes
  - Large vessels (over 125 ft)
  - Medium vessels (60-125 ft)
  - Small vessels (under 60 ft)

Large vessels

- Vessels over 125 feet have observers all the time
- All the hauls may not be observed
- But the ability to determine whether harvests came from critical habitat is good for this group

Medium vessels

- Vessels from 60 to 125 feet are only covered by observers 30% of the time
- Inside catches can be based on observer reports for a large part of the harvest
- But they have to be estimated for an even larger part

Medium vessels

- In general
- We have inside and outside catches for observed vessels
- We simply "inflate" these to the levels of total catch
- Assumes unobserved and observed are taken inside in same proportions

Medium vessels

- The estimation is done by
- taking the vessels in a given group
- (gear-stat area-year)
- and forming the ratio:
- Blend harvest/observed harvest
- for the vessels in that group

Medium vessels

- This ratio will be greater than one since the blend catch will be greater than the observed catch
- Because not all the boats in the group will be observed

Medium vessels

- Now you take this ratio
- and separately multiply it
- times observed catch from critical habitat
- and total observed catch

Medium vessels

- This inflates these observed harvests
- to reflect overall harvests
- and provides estimates of
  - all fish caught in critical habitat
  - and all fish caught outside of critical habitat

Small vessels

- No observer coverage for small vessels
- No way to know (from this source) whether or not a vessel caught fish in critical habitat
- And no way to use this estimation procedure

Two possibilities

- Assume that the small vessels took all of their catch in critical habitat
- Assume that the small vessels took their catch in critical habitat in proportion to the larger vessels

Important implications

- Tendency to underestimate percent of harvest from critical habitat
- Better information from BSAI than GOA

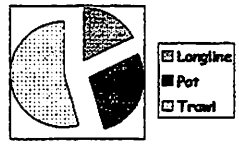
Gulf of Alaska (GOA)

Share of catch by gear

- Important to look at the relative importance of the different gears
- This will put other percentage statistics on critical habitat activity in perspective
- Heavy activity in critical habitat by a relatively little used gear may be less of a concern

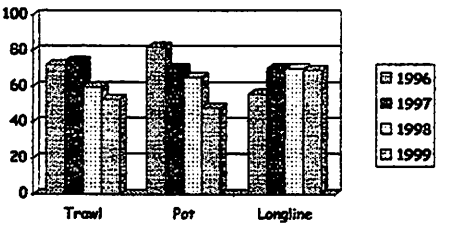
WGOA/CGOA Catch Shares

- Trawl CV - about half the catch
- With trawl CP - about 54%
- Pot CV and CP - about 28%
- Longline CV and CP - about 18%



A natural first question is, "what percentage of each gear's harvest comes from critical habitat?

Percent of GOA Catch From Critical Habitat



Vessels > 60 feet

The alternatives would move harvest out of the first season.

- Alternative 2
  - 40% of TAC January through April
  - 60% May through October
- Alternative 3
  - 40% January through April
  - 30% May through August
  - 30% September through October

So it is interesting to look at the percent of the harvest taken in each season.

Percent of GOA Catch by Season, Average '96-'99

Gear	Season 1	Season 2	Season 3
Longline	86.3	9.4	4.3
Pot	81.9	11.9	6.2
Trawl	85.9	5.1	9.0

Vessels > 60 feet

The alternatives also limit harvests in critical habitat

- Alternative 2
  - 20% limit in winter season
  - 31.8% limit in subsequent months
- Alternative 3
  - prohibits fishing in critical habitat

So its interesting to look at the percentages of catch coming out of critical habitat by season.

Percent of GOA Catch From Critical Habitat by Season, Average, '96-'99

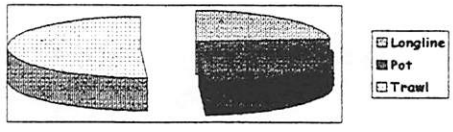
Gear	Season 1	Season 2	Season 3
Longline	75.3	24.1	16.9
Pot	66.9	82.6	85.0
Trawl	70.8	41.1	40.0

Vessels > 60 feet

The last two sets of GOA data look at the question of which gears contribute more to critical habitat catches.

The first looks at the proportion of GOA harvest by year. (Remember, we only have data for vessels greater than 60 ft).

Share of GOA CH Catch by Gear, 1999
(Vessels > 60 ft)



Vessels > 60 feet

The last GOA data set looks at the proportion of GOA catch by critical habitat, by season, by gear.

Percent of the GOA Catch from CH by Season by Gear, 1999 (Vessels > 60)

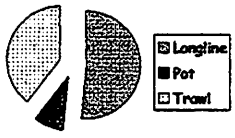
Season	Trawl	Pot	Longline	Total
1	26.6	8.5	11.9	47
2	0.1	3.9	0.5	4.5
3	0.8	1.8	0.4	3.0
Year	27.5	14.2	12.8	54.5

Vessels > 60 fcc

Bering Sea and Aleutian Islands (BSAI)

BSAI Catch Shares

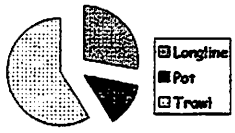
- Longline CP takes about 51% - almost no longline CV
- Trawl is next with about 39% - divded about equally between CV and CP
- Pot CV and CP is about 9%



But the patterns are somewhat different in the AI and BS.

AI Catch Shares

- Trawl takes most - about 58% (CP more than CV)
- Longline is next - 28% - almost all CP
- Pot CV and CP is about 13%

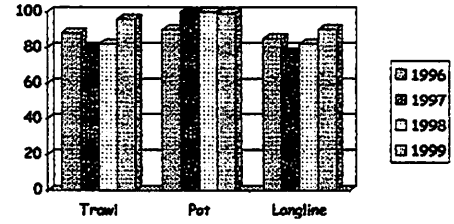


BS Catch Shares

- Longline CP takes about 56% - almost no longline CV
- Trawl is next with about 36% - CV somewhat more than CP
- Pot CV and CP is about 8%

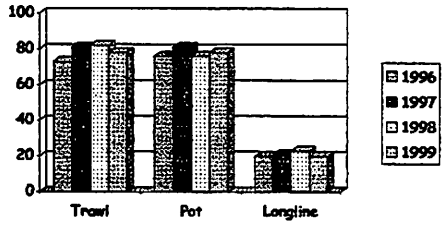
Again, a natural first question is, "what percentage of each gear's harvest comes from critical habitat?

Percent of Aleutian Islands Catch From Critical Habitat



Vessels > 60 feet

Percent of Bering Sea Catch From Critical Habitat



Vessels > 60 feet

The alternatives would move harvest out of the first season.

- Alternative 2
  - 40% of TAC January through April
  - 60% May through October
- Alternative 3
  - 40% January through April
  - 30% May through August
  - 30% September through October

So it is interesting to look at the percent of the harvest taken in each season.

Percent of BSAI Catch by Season, Average '96-'99

Gear	Season 1	Season 2	Season 3
Longline	61.8	6.1	32.1
Pot	42.8	43.2	14.0
Trawl	95.4	2.2	2.4

Vessels > 60 feet

The alternatives also limit harvests in critical habitat

- Alternative 2(BS)
  - 20% limit in winter season
  - Otherwise 3.6%
- Alternative 2 (AI)
  - 20% limit in winter season
  - 48.3% limit in subsequent months
- Alternative 3
  - prohibits fishing in critical habitat

So its interesting to look at the percentages of catch coming out of critical habitat by season.

Percent of BSAI Catch From Critical Habitat by Season, Average '96-'99

Gear	Season 1	Season 2	Season 3
Longline	28.1	31.9	22.4
Pot	92.9	74.5	63.6
Trawl	81.5	37.6	67.6

Vessels > 60 feet

Percent of AI Catch From Critical Habitat by Season, Average '96-'99

Gear	Season 1	Season 2	Season 3
Longline	80.5	92.8	81.3
Pot	93.8	98.3	98.7
Trawl	86.5	77.0	81.4

Vessels > 60 feet

Percent of BS Catch From Critical Habitat by Season, Average '96-'99

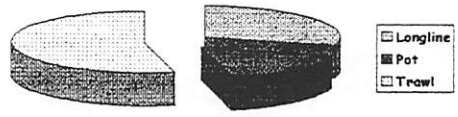
Gear	Season 1	Season 2	Season 3
Longline	22.2	21.9	18.8
Pot	92.5	70.6	59.1
Trawl	80.1	29.9	62.6

Vessels > 60 feet

The last two sets of BSAI data look at the question of which gears contribute more to critical habitat catches.

The first looks at the proportion of BSAI harvest by year. (Remember, we only have data for vessels greater than 60 ft).

Share of BSAI CH Catch by Gear, 1999 (Vessels > 60 ft)



Vessels > 60 feet

The last set of BSAI data looks at the proportion of BSAI catch by critical habitat, by season, by gear.

Percent of the BSAI Catch from CH by Season by Gear, 1999 (Vessels > 60)

Season	Trawl	Pot	Longline	Total
1	21.9	3.4	9.2	34.5
2	0.1	3.1	1.1	4.4
3	0.2	0.8	2.2	3.3
Year	22.3	7.4	12.5	42.2

Vessels > 60 feet

D. FRASER
C-2

Supplemental Comment by High Seas Catchers Coop

Elements of a Probability Analysis on Overlap and Restrictive Competition

An example based on the best available scientific and commercial data for the Aleutian Island area.

3.9 Quantification of the degree of overlap by size, area, and season

In a revised section "3.3.3 Annual Cod Consumption by Stellers" of the High Seas Catchers' Coop comments on the Draft EA/RIR, i made the following estimate of sea lion cod consumption in the AI based on the available data in the EA on population, scat analysis, and kg/day consumption based on the Perez and McAlister study:

Using the consumption estimate of 97,083 tons of "commercial" fish yields a Daily Ration of about 8.3kg, or an annual per animal consumption of 3,034 kgs.

Given 1996 C/WAI counts (the last available year in BiOp-1 or the EA) of 7,718 and a EAI (EBS) count of 4,716 sea lions, AI commercial fish consumption would be about 23,415 tons, and EBS consumption of about 14,308 tons per year. A similar tonnage of combined non-commercial (forage fish?) and non-fish species would also be consumed.

Because the FOO numbers are not additive, and because FOO doesn't translate to percent of stomach content, and because small fish like capelin are under represented in the scat due to complete digestion, it is difficult to come up with a proxy for what percentage by weight of a steller's diet that is cod. But to get in the ballpark, using the winter FOO as a proxy, 17.2% of the 23,415 tons (in the AI) would be about 4,027 tons per year of cod. In the EBS/EAI, 21.5% of the 14,308 tons of sea lion consumption of commercial fishes would be about 3,026 tons.

3.9.1 Upperbound Estimate of Sea Lion Cod Consumption in the AI

The foregoing was based on "counts" which are likely less than the total population. This is probably a lower bound estimate of cod consumption by sea lions. An alternative estimate can be derived from a new thesis by Arliss Winship, which may be an upper bound.

The paper by Arliss Winship, "Growth and Bioenergetic Models of Steller Sea Lions" estimates annual gadid (pollock and cod) consumption by sea lions in the Aleutian Island area of about 30,000 MT/year, and mackerel consumption of about 75,000 MT/year. The estimate appears to be based on sea lion population estimate for the Aleutian Island area of 26,272 animals. Based on the population information presented in the EA/RIR, this would seem to be an over estimate of the populations. Winship's estimates of kg's of fish consumed daily is also significantly higher than any of the consumption estimates presented in the EA/RIR.

Assuming that this is an upper bound estimate, i have attempted to look at the proportion of cod vs. pollock in the sea lion diet in the AI and estimated roughly 2/3rds the gadids in the AI sea lion diet was cod, or about 20,000 tons.

Information extracted from Winship, tables 3.7, page 78 and figure 3.7, page 80.

	Population Consumption	Per Individual year (tons)	Population numbers	mackerel consumption	gadid consumption
SE AK	157,000	5.763	*27,243*	*0*	72,900
GOA	115,000	5.982	*19,224*	*0*	76,400
EAI/EBS	88,000	5.813	*15,138*	*25,000*	*30,000*
CAI -1	49,000	5.843	*8,386*	*13,000*	*20,000*
CAI -2	70,000	6.257	*11,187*	48,700	*7,000*
CAI -3	14,800	6.455	*2,293*	*12,000*	*1,000*
WAI	27,800	6.310	*4,406*	*22,000*	*2,000*
All 540	*161,600*	*6.151*	*26,272*	*75,300*	*30,000*
540 + EBS/EAI	*249,600*	*6.027*	*41,411*	*124,000*	*60,000*
All AK	*521,600*	*5.936*	*87,878*	124,000	207,000

(numbers in italics were calculations based on information in the document, numbers in non-italic were taken directly from the document.)

Using the information in Figure 31, page 235 of the EA on cod sizes in Steller sea lion scat, I converted numbers by size bin into percentage of weight by size bin using the length weight conversion formula provided by Ren Narita at AFSC. This was used to produce figure 1 (attached) i then multiplied those percentages by the estimated total annual Steller sea lion cod consumption of 20,000 tons in the AI.

Cod Size in Steller Scat From EA - Fig. pg. 235		Est. AI sea lion cod consumption based on 20,000 tons of		
> cm	n	% #'s by bin	% wt. by bin	tons of cod by size
10	2	2.27%	0.01%	2
15	2	2.27%	0.05%	10
20	3	3.41%	0.20%	39
25	3	3.41%	0.41%	83
30	9	10.23%	2.29%	459
35	12	13.64%	5.13%	1,026
40	4	4.55%	2.68%	536
45	20	22.73%	19.89%	3,978
50	14	15.91%	19.83%	3,967
55	9	10.23%	17.56%	3,512
60	4	4.55%	10.45%	2,091
65	5	5.68%	17.10%	3,419
70	1	1.15%	4.39%	877

3.9.2 Dimensions of overlap – Size

In order to look at the overlap by size in more detail, i next took the information on the percentages of cod taken by the fishery in the AI by size intervals (based on NORPAC data provided by Ren Narita at AFSC) and examined the catch by size of a 20,000 ton harvest (roughly 11% of the BSAI TAC). Using the survey size distribution information in figure 3, page 196 of the EA, i made a crude attempt to approximate the biomass by size interval based on a total biomass of about 140,000 tons of cod. The following table provides a sense of the exploitation rate by size class of both the fishery and sea lions.

The following information was used to produce figure 3:

Cm sizes	Fishery - tons	Sea lions - tons	Biomass*
10	0	2	0
15	0	10	0
20	0	39	392
25	0	83	829
30	2	459	2,294
35	10	1,026	5,132
40	57	536	2,679
45	168	3,978	11,935
50	308	3,967	3,081
55	576	3,512	3,456
60	1,054	2,091	6,322
65	1,535	3,419	9,208
70	1,963	877	11,778
75	2,014	0	12,084
80	2,145	0	12,870
85	2,446	0	14,675
90	2,378	0	14,265
95	2,180	0	13,078
100	1,677	0	10,061
105	1,090	0	6,542
110	324		1,942
115	55		329
120	7		44
125	10		59
130	3		19
135			0

The biomass distribution by size is a rough approximation at best. However, the synthesis model used in both the cod and pollock stock assessments does produce a pair of tables of catch by age and biomass by age. If Grant Thompson and/or Rick Methot were to produce similar tables for cod, it would be possible to undertake a more refined evaluation of the fishery and sea lion exploitation rates by size classes and the degree of overlap.

The foregoing evaluates one dimension of overlap – the quantity of fish by size taken by the fishery and by sea lions, in a context of the available biomass.

3.9.3 Dimensions of overlap – Depth

The next dimension of overlap is in fishery depths. A figure 2 is attached showing trawl depths plotted against sea lion dive depths. The data on sea lion dive depths was taken from work done by Merrick and Loughlin ("Diving Behaviour of Adult Female Steller Sea Lions in the Kuril Islands, Russia" table 3, page 28 and "ADF&G Wildlife Technical Bulletin No. 13" May 1996, table 2, page 144).

3.9.4 Dimensions of overlap – Feeding Area

Another dimension of overlap is the foraging areas used. The Kuril study by Loughlin noted that "Most (94%) locations indicated that sea lions foraged within 10 km of the capture island, but some traveled as far as 263 km." Further examination of more recent telemetry data should be undertaken in the EA. Certainly, none of the AI trawl fishery occurs within 10km (or even 10 nautical miles) of any rookery.

3.9.5 Dimensions of overlap – Feeding Time / Fishing Time

The two papers cited above both make reference to the tendency of sea lions to do more feeding at night. This is another dimension of overlap. Very little cod fishing by trawlers in the AI is done at night.

3.9.6 Dimensions of overlap – Use of Cod by Young Sea Lions

Another dimension of overlap is the use of prey by the animals whose lack of survival is the proximate cause of the failure of the sea lion population to recover – young of the year pups in transition to 'juvenile-hood.' These animals rarely dive more than 72 meters according to the EA. It is also probable that they are less likely to seek large cod as prey, based on their size and dive range.

3.9.7 Dimensions of overlap – Rank of Cod in Sea Lion Diet

A further dimension of overlap is the role of cod as sea lion prey vs. the other components of its diet. The EA table 21, page 290 makes it clear that cod is a small percentage of the overall diverse diet of sea lions in the AI, with only 17% frequency of occurance even in winter. Cod is only a small proportion of the overall standing biomass of prey species available to sea lions in the AI. (It seems significant to note in this context that sea lions select for cod at a lower rate relative to the cod biomass than they do for many other species, such as snailfish, sculpins and salmon.)

This dimension of overlap ties into the role of cod as a predator to sea lions. Cod are clearly an opportunistic predator that feed at a very similar trophic level with sea lions. In fact in the AI, their diets mirror each other very closely. (see Livingston papers referenced in Preliminary Comments.)

3.9.8 Integrating Dimensions of Overlap

Each of these dimensions of overlap interact in a cumulative manner to diminish the significance of any competition that may occur in terms of cod as a shared resource between sea lions and the fishery. Based on this blend of qualitative and quantitative probability analysis the Protected Resources division of NMFS should reasonably conclude that the status quo cod management system in the AI with regard to spatial and temporal distribution of the fishery is not likely to appreciably impact sea lions in an negative manner. A similar analysis in necessary for the EBS and GOA.

Dive Overlap - Stellers & Trawl Fishery

Dive information from:

"Diving Behaviour of Adult Female Steller Sea Lions in the Kuril Islands, Russia" Loughlin, 1998
Table 3, page 28 & "ADF&G Wildlife Technical Bulletin No. 13" May 1996, Table 2 pg. 144

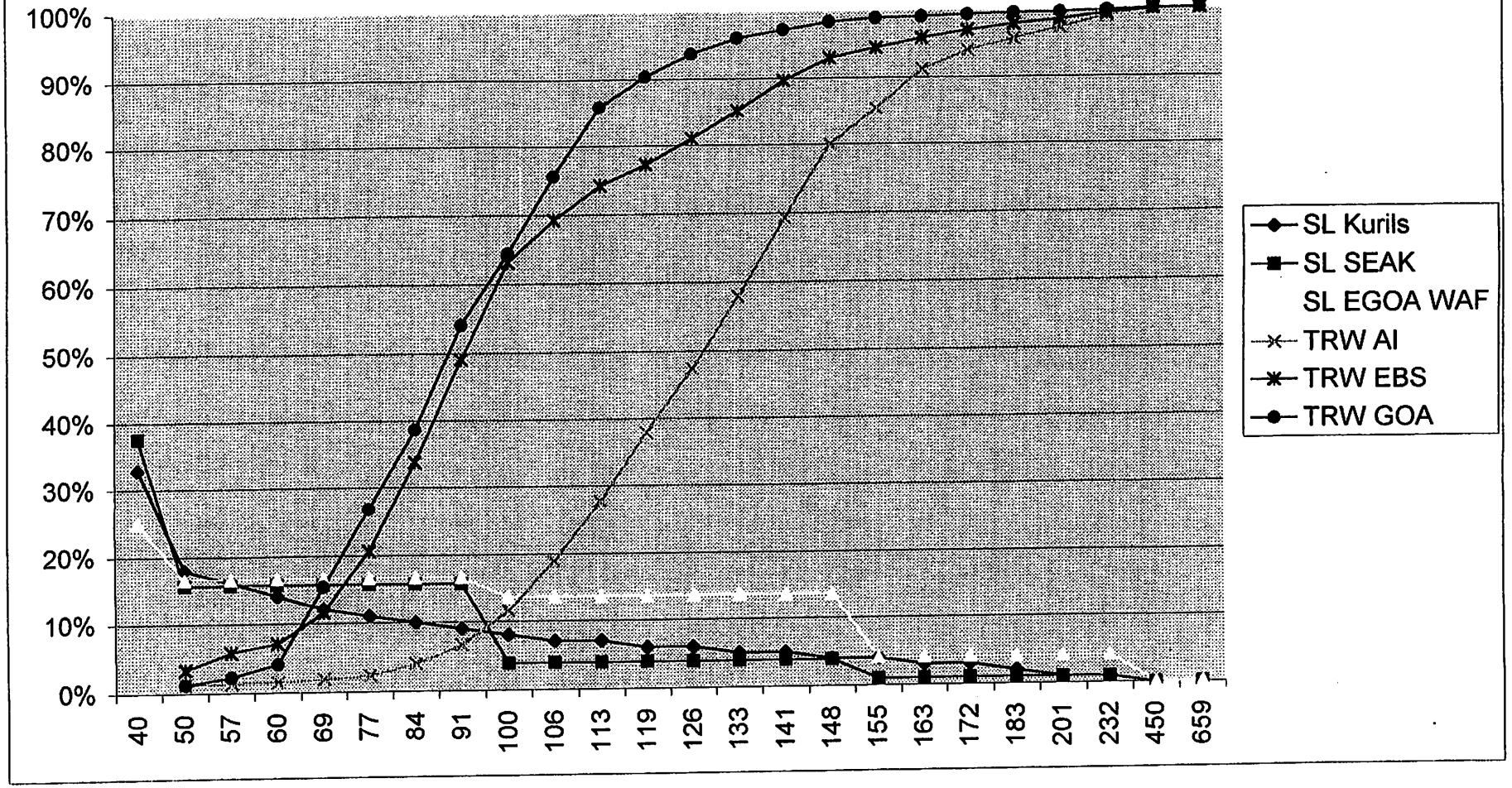
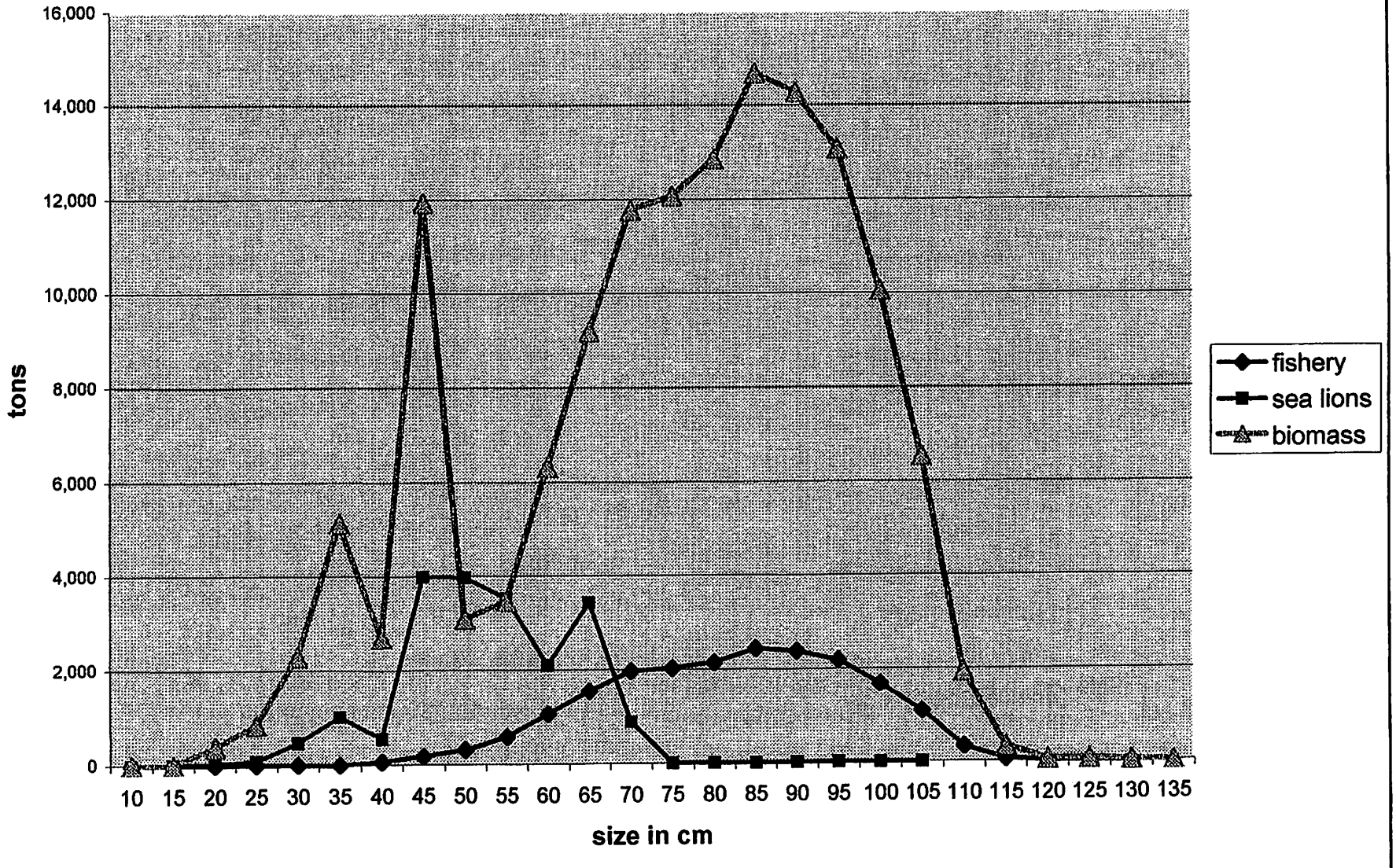
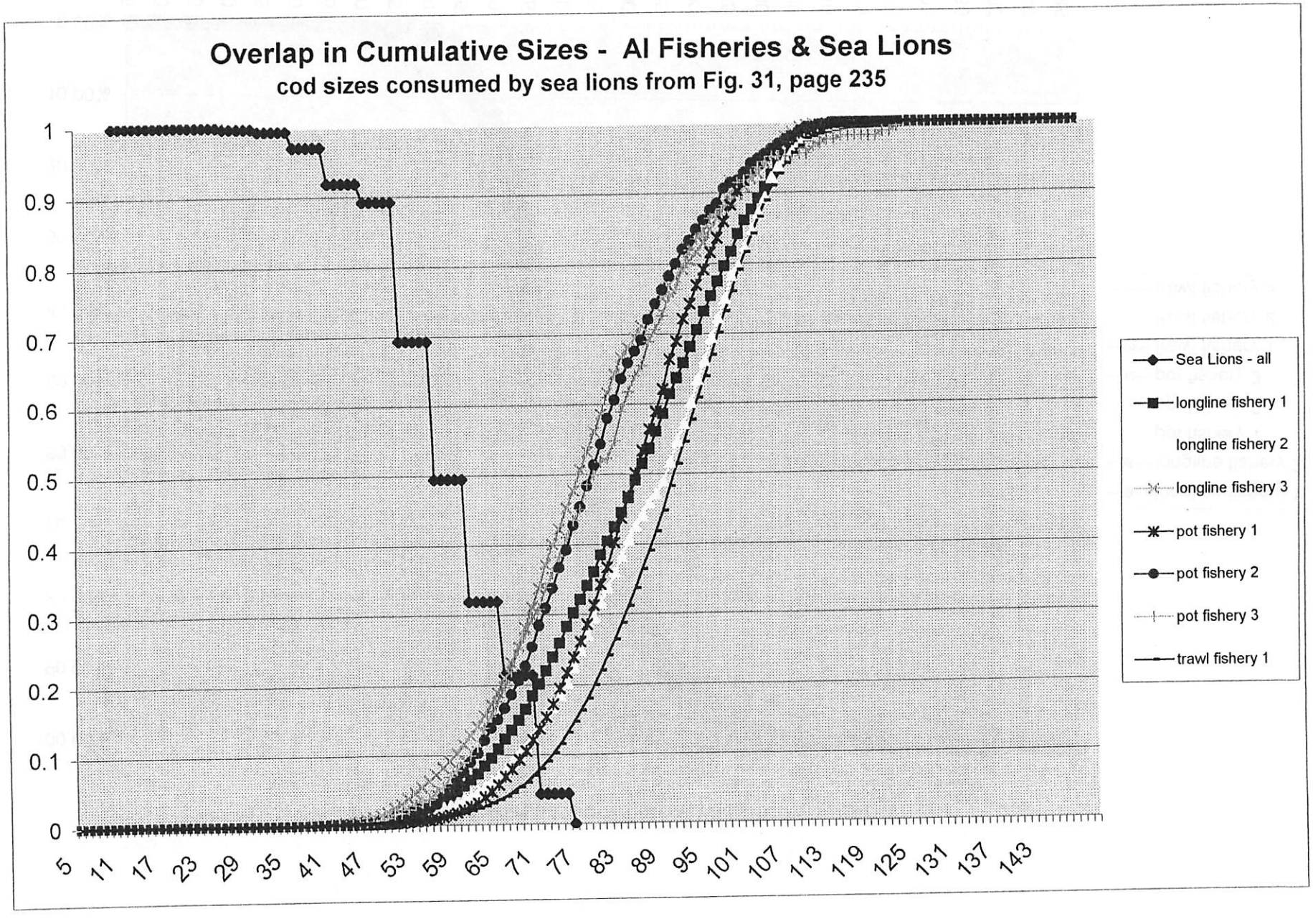
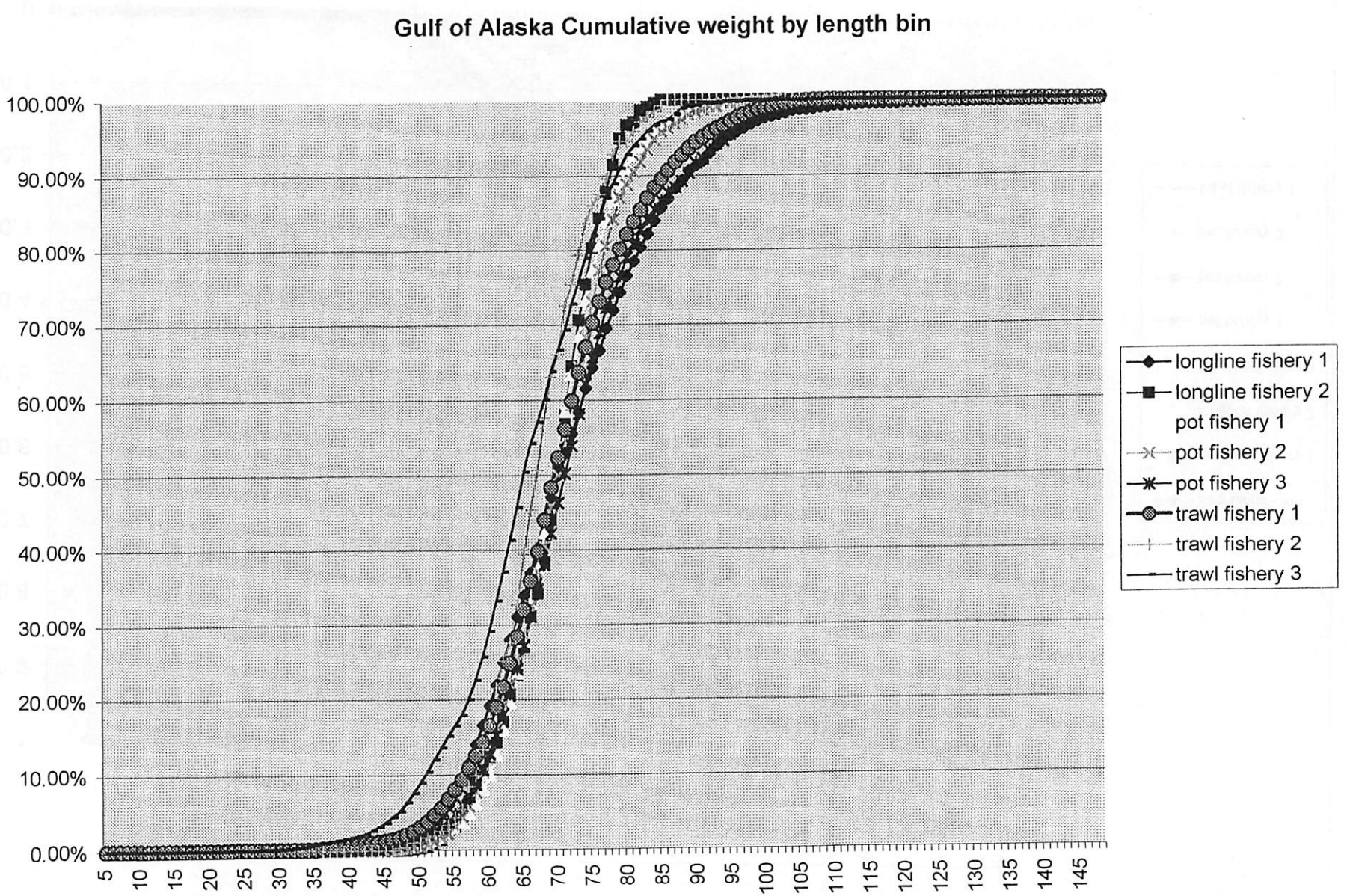


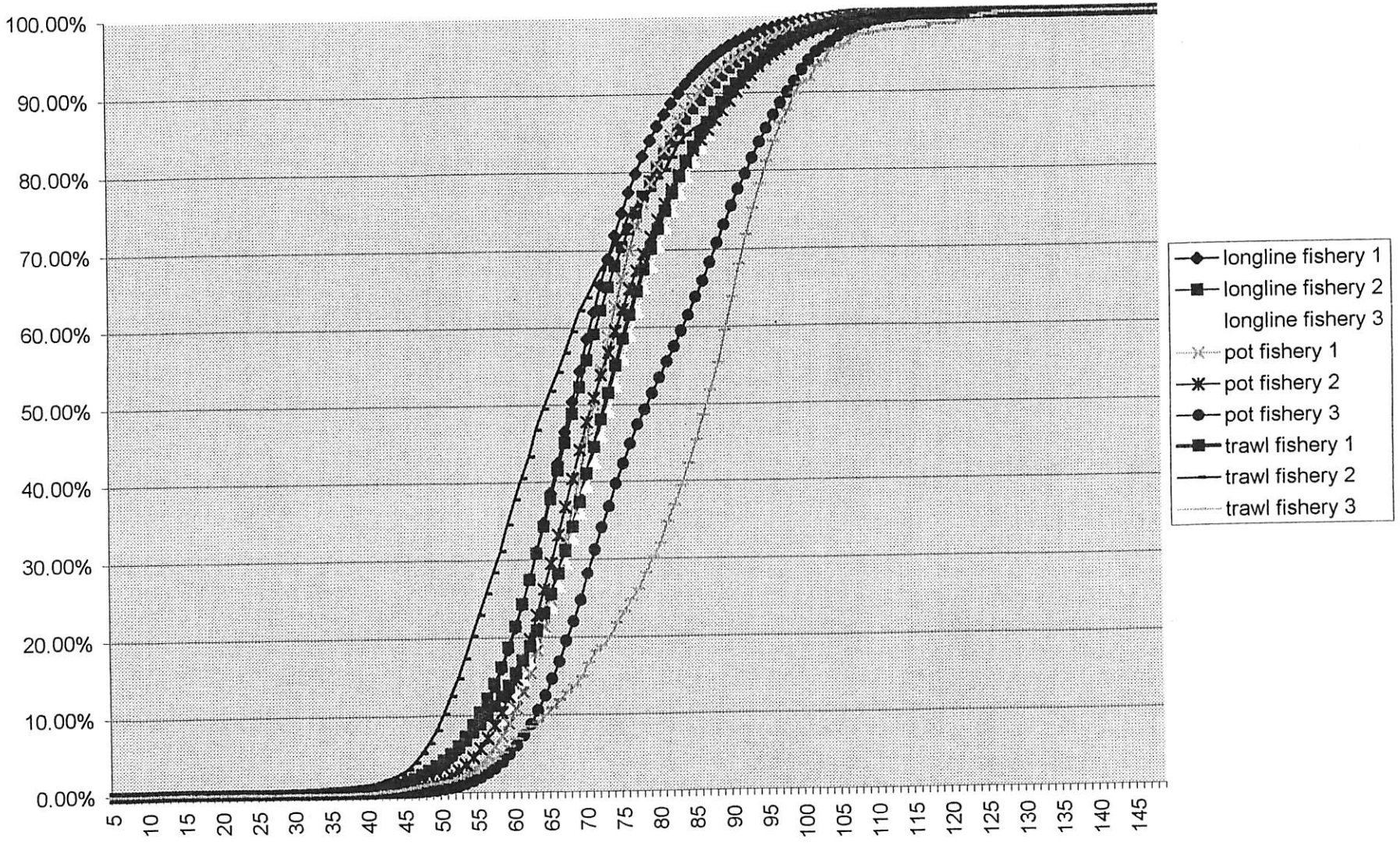
Figure 3 - Biomass and Consumption by Size - Fishery and Sea Lions




Overlap in Cumulative Sizes - AI Fisheries & Sea Lions
cod sizes consumed by sea lions from Fig. 31, page 235
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
5
11
17
23
29
35
41
47
53
59
65
71
77
83
89
95
101
107
113
119
125
131
137
143
Sea Lions - all
longline fishery 1
longline fishery 2
longline fishery 3
pot fishery 1
pot fishery 2
pot fishery 3
trawl fishery 1


Gulf of Alaska Cumulative weight by length bin
100.00%
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
110
115
120
125
130
135
140
145
longline fishery 1
longline fishery 2
pot fishery 1
pot fishery 2
pot fishery 3
trawl fishery 1
trawl fishery 2
trawl fishery 3

Bering Sea Cumulative weight by lenght bin



Steller sea lion - fisheries interactions in the Bering Sea and Gulf of Alaska

A Comment on the US National Marine Fisheries Service Biological Opinion

by

I.L. Boyd

1. Preamble

1.1. This comment is based around the questions put to the independent Scientific Panel that was constituted by the North Pacific Fisheries Management Council to review the Biological Opinion issued by NMFS on 3 Dec 1998. The Opinion concerned authorization of Atka mackerel and walleye pollock fisheries in the Bering Sea - Aleutian Islands fishing grounds and the walleye pollock fishery in the Gulf of Alaska. Although invited to participate, other commitments did not permit me to sit on this panel.

1.2. The comment also forms a written response to an invitation to appear as a possible witness before the Congressional hearing of the House Resources Committee on 20 May 1999. Again, due to other commitments, I was unable to take up this invitation.

1.3. Declaration of interests. This comment is a personal point of view. It does not necessarily represent the views of my employer. There will also be no financial consequence for me whatever decisions are made about the fisheries management actions being proposed in the Opinion. I have received no payment for this comment and I have no affiliation, income or other association with any US government agency, the fishing industry or any non-governmental organisation that has an interest in this issue. My interests are purely academic.

Question 1. Do the best available scientific and commercial data in the opinion support a conclusion that the pollock fisheries compete with the western population of Steller sea lions?

2. **Sub-question 1.1** Were the best scientific and commercial data available considered in addressing the issue of potential competition between Steller sea lions and the pollock fisheries?

2.1. The opinion is a reasonably thorough review of the literature and available data. It is built upon the twin pillars of opinion that Steller sea lions are suffering food deprivation indicated by poor body condition and that the major demographic impact of this is observed amongst juveniles. However, the Opinion could have amplified key issues relating to the level of confidence that one can place in supporting data and, in particular, it could have done a better job of identifying critical gaps in basic knowledge. Some of these can be summarised as follows:

(i) Current estimates of Steller sea lion population trends are, to an important degree, uncertain. While there is without doubt a continuing overall decline in numbers in the western population, the rate of decline is inconsistent among regions and in some parts of the western population there would even appear to be a slight increase in numbers.

(ii) The data used to build many of the current ideas about the causes of the decline in Steller sea lions (high juvenile mortality, poor body condition) are now somewhat out-dated (collected in the 1970s -1980s). The demographic and physiological indices derived from these data have specific problems associated with them, especially in relation to how well they represented the population they were taken from, even at the time the samples were obtained.

(iii) The Opinion, in general, ignores evidence that does not provide positive support for the main hypotheses. For example, despite recent research efforts that were designed to target sensitive periods of the reproductive cycle, there is no evidence that adult females or their pups suffer reduced body condition. Although, for practical reasons, these studies were restricted to rather narrow time periods within the reproductive cycle, the studies were designed around the responses of related pinnipeds to known periods of food deprivation. The fact that no evidence of either acute or chronic food deprivation has been detected seems not to have resulted in an adjustment the opinion expressed by NMFS.

(iv) Insufficient attention may have been given to parallel studies of related pinnipeds. Steller sea lions are particularly difficult to study so it seems reasonable that NMFS should draw as much information as possible from studies of other pinnipeds that have general implications. For example, information about foraging ranges shows that pinnipeds generally forage over much greater distances and are apparently more able to move in directed ways to foraging grounds than had generally been expected in the past. Set in this context, it is therefore possible that the concepts of critical habitat and localised depletion as presented in the Opinion require to be updated.

(v) Although studies of diet have taken place and these are useful, knowledge of the diet of Steller sea lions is still not very substantial, especially from the GOA and BSAI. Diet sampling is known to be biased and it could be argued that the way in which diet has been assessed to date was likely to show that Steller sea lions depended on pollock because samples have mainly been obtained from locations adjacent to known areas of pollock concentration. The important question is, how representative is this of the diet of the population as a whole and especially of the diet at critical phases of the annual or life cycle?

(vi) The Opinion could have done more to highlight the potential interpretations of the diet information. The fact that sea lions and the fishery apparently take pollock of a similar size range does indeed provide evidence of overlap and of potential competition, but it also could be used to suggest that there is no competitive exclusion of sea lions and that sea lions are not having any trouble competing with the fishery. If the fishery really does deplete the major size classes it takes then we would expect sea lions to concentrate their predation upon the size classes that are not fished so

heavily. Perhaps Fig. 40b provides some supporting evidence for this?

2.2. Several important statements within section 5 of the Opinion appear not to be well supported by data. These include:

P99, paragraph 2. *There is general scientific agreement that the decline of the western population of Steller sea lions results primarily from declines in the survival of juvenile Steller sea lions*. While it is true that the observed population decline could, in theory, be due to reduced juvenile survival, there is very little evidence for this. In fact, populations are more sensitive to adult female survival so there are also good theoretical reasons for suggesting that a smaller reduction in this parameter could have resulted in the decline, although evidence is also lacking for this. Again, the data used to derive this conclusion are somewhat out of date and of questionable quality.

P99, paragraph 2. *There is also general scientific agreement that the cause of the decline in the survival of juvenile Steller sea lions probably has a dietary or nutritional cause*. Again, the evidence for this is lacking and, as stated above, if one weighs up the evidence supporting such a statement with the evidence against, it would really be impossible to derive such a sweeping conclusion. However, it does remain as a primary hypothesis.

P99, paragraph 5. *There seems to be general agreement in the scientific community that the western population of Steller sea lions would fare better on a more diverse diet consisting of herring, capelin, or eulachon*. Beyond a few inconclusive pilot studies of captive sea lions, no evidence exists to support such a strong statement.

P101, paragraph 4. *The winter months are an important foraging period for Steller sea lions because their greater metabolic demands during the harsh winter period increase their energy demands and make them more sensitive to reductions in prey availability*. Also see item (a) in paragraph 2 on P102. The energy demands of Steller sea lion in winter have never been measured. I would not dispute the idea that the winter months are likely to be an important foraging period, but we really do not know anything about relative sensitivities to prey availability at different times of year in any pinniped. These types of animals exhibit behavioural and physiological mechanisms that can be used to balance energy budgets throughout periods of fluctuating prey abundance.

P108, paragraph 3. ...*seem to rely on aggregations of walleye pollock*. While there are dietary studies that support the view that Steller sea lions feed mainly on pollock in some parts of their range, there is no evidence that they require aggregations of pollock.

P85, paragraph 4. ...*but the effect* [of intentional take of Steller sea lions] *would not account for the total decline of the western population*. There is little evidence to support this statement. If one adds up all the records of intentional kill there is a shortfall and these numbers do not account for all the decline. However, there appears to have been a culture of

extermination directed towards the Steller sea lion in Alaska and we have to accept that the records of intentional killing may fall well short of the true levels of killing that took place through the 1960s and 1970s. Some of the anecdotal descriptions of what went on are, frankly, shocking if they are to be believed.

P71, paragraph 2. I feel that the way in which the potential impact of the subsistence harvest has been portrayed diminishes its potential significance. There are few management options available to improve the lot of the Steller sea lion. Stopping the intentional killing is perhaps the most obvious, easily implemented and immediate action that could be taken. The value of 6% given in this paragraph is misleading. If one considers this as a proportion of the mortality that is actually causing decline then the percentage taken in a subsistence harvest is closer to 15%.

P102, paragraph 4. *As a result, there is a high risk that the western population of Steller sea lions could become extinct within the foreseeable future if their decline is not abated and their rate of increase is not improved.* On the surface, this is a reasonable statement, but it ignores some of the basic principles of population regulation and, to a degree, it contradicts the food-limitation hypotheses that is clearly being pursued as a policy by NMFS. If food is the limiting factor, then we would expect that, through the processes of density-dependence, the population would self regulate to match its food supply. Although unpredictable population fluctuations can occur because of the intrinsic dynamics, in general, we would expect the population to stabilise at a reduced level, if it was being regulated by a density-dependent process. What this statement in the Opinion is implying is that NMFS does not believe that a density-dependent process is operating which suggests to me that they believe that it is not just food depletion that is responsible for the decline of Steller sea lions.

2.3. The final statement I have highlighted above in section 2.2 indicates a further philosophical flaw. On P100, NMFS provides the three assumptions that, in their view, require to be addressed by the Opinion. To my mind, a central assumption must also be that Steller sea lion populations will exhibit classical density-dependence. I have found no acknowledgment within the Opinion that this is a possibility. As a result, it would appear that little research has taken place to examine the population data for evidence of density-dependence. In my view, it is remarkable that the decline in the Steller sea lion has continued in a sustained manner for so long. This suggests several possible processes:

(i) The population is continuing to track a resource that is in long-term decline.

(ii) Because of time lags and difficulties with collecting high quality population data (and perhaps because nobody has looked), density-dependent recovery/stabilisation of the population is already under way but cannot be detected at present.

(iii) The population is being regulated by a factor that is insensitive to density.

2.4. Item (i) could result from long-term changes in the environment that are being tracked by sea lions or from a sustained increase in fishing pressure on the food resources that support Steller sea lions. I see no evidence for a long-term, sustained increase in fishing pressure, except perhaps in terms of the apparent increased localisation of the fishery around possible critical habitat, especially in the BSAI region. Conversely, there is evidence of a proximate change in the environment, although how this impacts Steller sea lions is uncertain. Item (ii) requires to be eliminated by improving the population data and revisiting its analysis. Item (iii) is the most problematical possible underlying cause of the decline because there are few factors that are completely insensitive to density. Two such factors are pollution and predation by a numerous and powerful predator that regards Steller sea lions as a secondary or tertiary prey item and whose own population dynamics is unaffected by whether or not Steller sea lions can be hunted. The only two groups of predators that potentially fit this description are man and killer whales.

3. **Sub-question 1.2** Do the available scientific and commercial data provide a reasonable scientific basis to conclude that the pollock fisheries, if left unchanged, could reasonably be expected to jeopardize the continued existence of the western population of Steller sea lions?

3.1. Based on the arguments I have made above concerning density-dependence and the fact that the functional relationship between pollock and Steller sea lions is unknown, I think the answer to this question would have to be a qualified no.

3.2. I do not believe that food depletion caused by a viable, commercial and unsubsidised fishery, on its own, is likely to result in the extinction of the Steller sea lion. In the worst case, it could deplete the population to such an extent that it would then become vulnerable to additional stresses, including natural disasters and by-catch, that could cause extinction. In my view, so long as the fishery was not subsidised, the fishery would go extinct long before the sea lion.

3.3. It seems most probable that Steller sea lions, like most pinnipeds, forage on the most abundant prey within their range. If the current stock assessments for pollock are to be believed, then there would appear to be sufficient pollock for sea lions. It is possible that sea lions rely on locating prey patches and if a fishery reduces the frequency of patches in the environment or the quality for sea lions (note may be different from their size), then they may have trouble balancing their energy budgets at critical times. However, there are several lines of evidence that do not support this argument, even though it is an area that merits much more theoretical and practical research. These are:

(i) If sea lions relied on locating prey patches, we might expect a strong interaction between fishing vessels and sea lions (as happens between Hooker's sea lions and pelagic trawl squid fisheries in New Zealand). The logic for this is that fishing vessels will predate patches which should also attract sea lions and also, in the eyes of a sea lion, some of the densest aggregations of pollock to be found will be at the back of

fishing vessels. As far as I am aware there is no strong interaction between fishing vessels and sea lions. An explanation for this may be that, due to many decades of depredation by man of sea lions around fishing vessels, there has been very strong selection for vessel avoidance by sea lions, assuming that such a feature could be an inherited trait.

(ii) Probably the most critical nutritional phase in the life-history of Steller sea lions is early lactation when mothers (the reproductively active segment of the population, which is critical to the dynamics of the population) are restricted to foraging within a specific radius of the breeding rookeries. At all other times they are free, at least in theory, to move to where the food is. Thus, even if patch distribution is altered to the detriment of sea lions, they have flexibility in where and how they forage. Experimental studies both in pinnipeds and other predators show that these predator have quite remarkable flexibility and are rarely bound to a stereotypic pattern of behaviour. During early lactation, when this flexibility is greatly reduced resulting in potentially greater sensitivity to the distribution of food, the current data do not suggest that mothers are encountering nutritional stress.

3.4. The Opinion did not appear to contain any statement about the probable social and financial costs of the proposed RPAs. In my view, it is very difficult to assess the validity of RPAs without these. For example, if the net cost to the industry of introducing the RPAs was negligible then, even without supporting biological data, they could be considered to be reasonable and prudent. Conversely, if they resulted in severe financial or social distress then one may not come to the same conclusion.

4. **Sub-question 1.3** Do the available scientific and commercial data provide a reasonable scientific basis for the conclusion that the pollock fisheries, if left unchanged, could reasonably be expected to adversely modify the critical habitat of Steller sea lion?

4.1. Much of my response to sub-question 1.2 is also relevant to the assessment of effects on critical habitat. The jury is still out on exactly what "critical habitat" Steller sea lions require. Our's is still a very land-based view of these animals.

5. **Question 2** If you conclude that the available data and analysis support the conclusion that the pollock fisheries could reasonably be expected to either jeopardize the continued existence of the Steller sea lion or adversely modify its critical habitat, then are the principles for establishing the RPAs adequately supported by the available scientific and commercial data?

5.1. The Opinion provides the logic for the proposed RPAs. However, since little is known about how either the spatial or temporal distribution of pollock affects Steller sea lions then there seems to be little scientific evidence to underpin the RPAs. Nevertheless, if one wishes to adopt a cautious approach in a situation where there is almost no information then the RPAs, as proposed here, would appear to be reasonable. In particular, preventing extreme spatial and

temporal concentration of fishing effort would appear to be a prudent action, even if there is little foundation for this in the scientific data.

5.2. In my view, the central questions are, what level of risk is there associated with continuing with the present fisheries policy and how would this be changed by the recommended RPAs? As I have indicated, I believe the level of risk associated with the current policy is likely to be low because there is no strong evidence linking the decline in Steller sea lion abundance with the pollock fishery. Unfortunately, it is impossible to formally quantify the risk involved.

5.3. Nevertheless, the decline in the population of Steller sea lions has, almost without doubt, multiple causes, with many different factors contributing to the decline. The strength of the contributing factors will also vary in space and time and it may not be sensible to imagine that a single dominant factor will emerge from well designed research. Moreover, even if such a factor did emerge, it may be beyond our capabilities to do much about it. Manipulating the fishery is one of the few tools we have available to us and the current RPAs are an honest attempt by NMFS to satisfy the demands of its many constituents.

5.4. As stated in 3.4, the validity of the proposed RPAs really depends on the financial and social cost-benefit analysis. If this has been done, then it does not appear to have been made available in the current documentation. Therefore, it really is impossible to judge the meaning of "reasonable" in the context of these RPAs.

6. **Sub-question** The views of the panel are solicited as to other approaches that could be considered by the Council for the longer term, and that would still be supported by the available scientific and commercial data?

6.1. The problem with the RPAs as they stand is that they are a shot in the dark. There is no way of properly assessing either if they are a reasonable approach or their subsequent effectiveness. They are only supported by simple conceptual models with no predictive capability. If they are implemented then it should be understood that they are being carried out because there is a perception that something has to be done to alleviate the decline of the Steller sea lion, not because they have a reasonable chance of succeeding in their objective. The currently proposed RPAs may help our consciences but they are much less likely to help Steller sea lions.

6.2. In reality, whatever the root cause of the decline in the Steller sea lion population is, there are relatively few factors that managers have the power to control. Since it appears that by-catch and illegal hunting may be under control, reducing either fishing pressure on their food source and legal hunting are about all that remains to be manipulated.

6.3. I have already gone on record as saying that the most immediate and reasonable prudent action that could be taken would be to stop all hunting of Steller sea lions. Unlike the RPAs proposed in the current Opinion, we know this will have an immediate impact on the number

of Steller sea lions. If society values Steller sea lions enough, then it may be reasonable to compensate local peoples for the loss or suspension of their traditional right to hunt Steller sea lions.

6.4. In the meantime, much more could be done to examine ways of modelling the interactions between Steller sea lions and fisheries with a view to developing properly constructed management strategies that, if applied in the long-term, might be both effective and be seen to be effective. This would also provide a consistent framework within which the fishery could plan its investment and operational strategy.

6.5. The Steller Sea Lion Recovery Plan has manifestly failed to achieve its objectives, despite much investment in research. At the same time, one of the best regulated and most thoroughly investigated fisheries in the world has been managed with little formal recognition of the need to include competing top-food-chain predators as explicit parts of the pollock stock assessment models. We have the intellectual foundations to achieve such an integration but institutional barriers prevent meaningful progress. If the United States wishes science to begin to provide practical, strategic solutions to the problem of Steller sea lion interactions with pollock then it has to break these barriers down.

6.6. In the end, the problem of what should be done to help Steller sea lions out of the hole they are in is not one that science can solve. It is a matter for the democratic process to decide if people place a higher value on having Steller sea lions than cheap fish or if they are willing to take the risk involved in trying to have both.

C -2

Mr. Chairman, my name is Ed Richardson and I'm here to represent the Pollock Conservation Cooperative, a group of eight seafood companies that operate catcher-processors in the Bering Sea pollock fisheries.

My presentation covers two aspects of the EA. First, I'll review very briefly the key results concerning nutrient stress, and the objective here is to illustrate how conjecture can end up being perceived as reality. Second, I'll briefly review some results not included in the EA, again with the objective of fleshing out concerns over what the companies I represent consider to be a biased or too narrow viewpoint put forward in the EA.

The PCC has two requests of the Council at this point, and I'll state them now. First, we request that the Council indicate its preference for Alternative 1 (status quo) at this point in the process, in part as a way to send a message to the NMFS that there are valid concerns put forward by the SSC and the AP that must be incorporated into a revised document before any real preferred alternatives can be identified. Second, we request that the Council send a letter to the NMFS indicating its strong desire that the agency address the science concerns put forward by the SSC and AP as it endeavors to complete the comprehensive FMP-level consultation that it will deliver on October 31. Here, I am thinking specifically about those portions of pages 6 and 7 of the AP minutes that deal with commercial fisheries and Steller sea lion interactions generally, and the SSC items number 4, 5 and 11.

With that I'll show a few slides to complete the presentation.

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With that I'll show a few slides to complete the presentation.

Key Results — EA/RIR Cod - Steller Sea Lions

Are Steller sea lions food limited? (page 54)

Studies of animals collected in the GOA in 1975-1978 and 1985-1986 indicate that animals in the latter collection were smaller, took longer to reach reproductive maturity, produced fewer offspring, tender to be older, and exhibited signs of anemia -- all observations consistent with the hypothesis of nutritional stress (Calkins and Goodwin 1988, Pitcher et al.in review, York 1994). In addition, survival of juvenile animals appeared to have dropped in both the eastern Aleutian Islands (Ugamal Island; Merrick et al. 1987) and the GOA (Marmot Island, Chumbley et al. 1997).

The Population Dynamics of Northern Sea Lions, 1975-1985.

— Anne E. York, Marine Mammal Science 10(1):38-51 (January 1994)

(from the abstract)

Observation: Samples of northern sea lions taken in the vicinity of Marmot Island, Alaska, during 1975-78 and 1985-86 indicate the average age of females older than 3 yr increased by about 1.55 yr (SD=0.35 yr) while the population was declining at about 5% per year. Fecundity rates decreased by 10% over the same period, but the decrease was not statistically significant (Calkins and Goodwin 1988). Possible causes of the population decline and the change in age structure were examined by writing the Leslie matrix population equation in terms of changes in juvenile and adult survival rates and fecundity, and examining the short-term behavior of the trajectories of the average age of adult females, total number of females, and total number of pups with respect to those changes in vital parameters. . . . .

Explanation: An explanation for the observed declines in numbers of adult sea lions consistent with the observed fecundity rates, a rate of decrease of 5% in the number of adults, and the corresponding increase in the average age (of females 3 yr and older) was a 10%-20% *decrease in the survival of juveniles* (age 0-3 yr) coupled with an *insignificant change in adult survival* (0.03%, SD=1%).

(from the discussion)

As a result of this analysis, biologists at the National Marine Mammal Laboratory have begun intense work on the biology of juvenile sea lions: included are projects on what prey are important for them and how the limitations in their diving physiology limit their foraging capabilities.

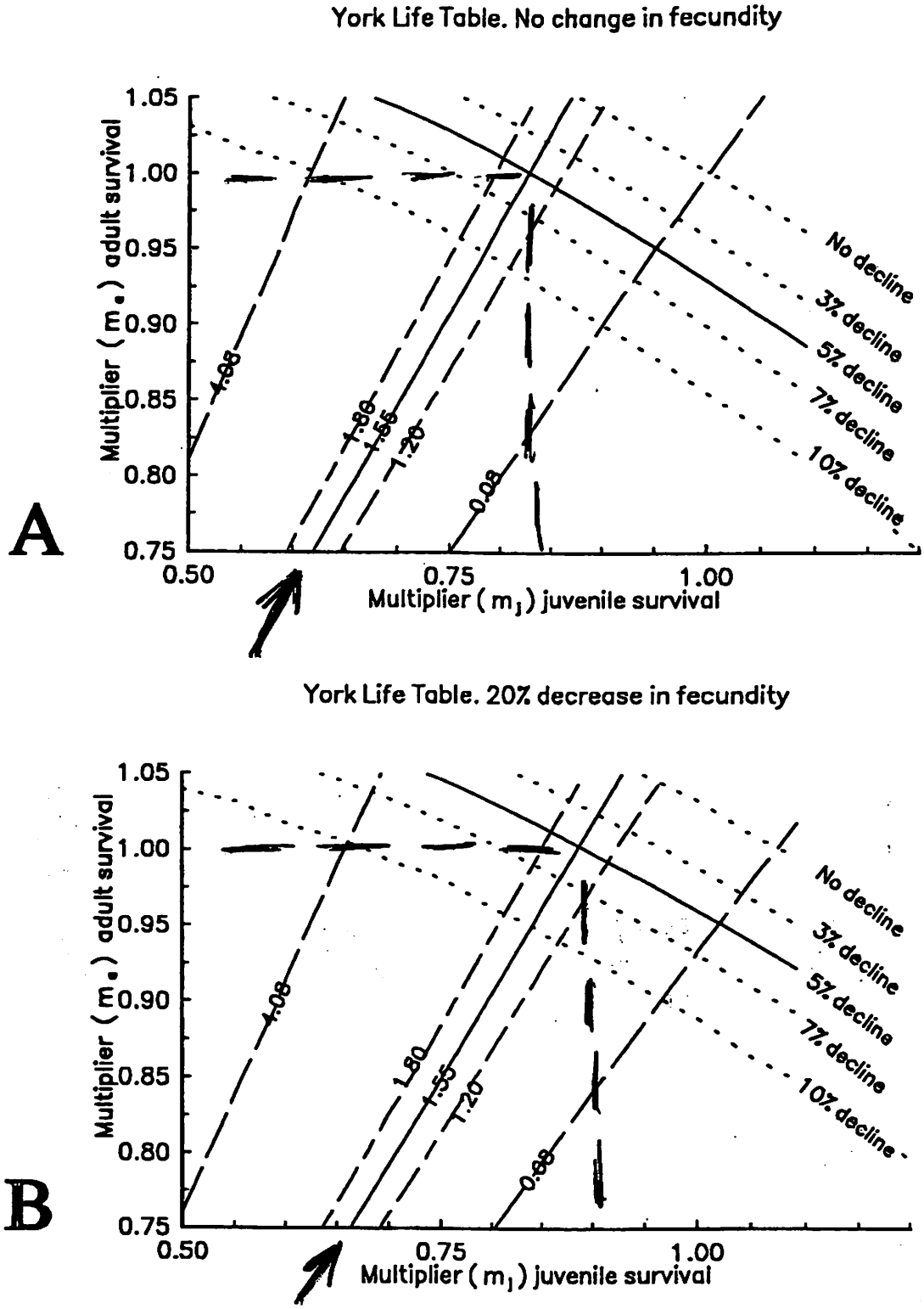


Figure 3. A. Contours of rate of decline (10, 7, 5, 3, and 0%) and change (0, 1.23, 1.55, 1.80, and 4 yr) in average age of females older than 3 yr, 10 yr after a sudden change in juvenile and adult survivals corresponding to combinations of multipliers (m_j and m_f), assuming no change in fecundity from the York life table. B. Contours of rate of decline (10, 7, 5, 3, and 0%) and change (0, 1.23, 1.55, 1.80, and 4 yr) in average age of females older than 3 yr, 10 yr after a sudden change in juvenile and adult survivals corresponding to combinations of multipliers (m_j and m_f), assuming a 20% decrease in fecundity from the York life table.

The Impact of Killer Whale Predation on Steller Sea Lion Populations in British Columbia and Alaska

Lance G. Barrett-Lennard, Kathy Heise, Eva Saulitis, Graeme Ellis, and Craig Matkin
October 1995

Data Sources and Methods

- Mariner reports (126) describing predation and non-predatory interactions between killer whales and marine mammals.
- Analysis of the stomach contents of 22 stranded killer whales.
- Photo-identification records data bases of the NMFS NMML, the Pacific Biological Station, and the North Gulf Oceanic Society.
- Computer simulations to estimate predation on SSLs using Leslie models of the SSL population structure and killer-whale bioenergetics.

Killer Whale Predation on Seals and Sea Lions

SSL Natural History

- Unequivocal evidence that seals and sea lions escape killer whale predation by size. Even adult female Steller sea lions, at only 270 kg average weight, appear to escape predation by killer whales due to their size.

.... Approximate age categories were determined for 57 of the 72 harbor seal kills witnessed by Baird (1994). Sixty percent were pups, 19% were juveniles, and 21% were adults. Hoelzel (1991) reported that 54% of observed attacks on southern sea lions were of pups and 41% of the attacks were of adults. Adult southern sea lions are smaller than Steller sea lions, weighing between 140-350 kg (Nowak 1991). None of the observed attacks by killer whales of southern sea lion adults were successful (Hoelzel 1991). Lopez and Lopez (1985) investigated the intentional stranding of killer whales at Punta Norte, Argentina preying upon southern sea lions (Otaria flavescens) and southern elephant seals (Mirounga leonina) They also found that killer whales fed predominantly on pups and small juveniles. [pp.12-13.]

.... Although Hoelzel witnessed 96 attacks on adult sea lions, none was fatal, whereas 39% of the 209 attacks on pups were fatal. [p. 15.]

In 16 reports of fatal attacks on adults, the majority of sea lions were small adults. In the single account of a large sea lion bull that was taken, 15-20 killer whales were present. [p. 10.]

Killer Whale Predation on Seals and Sea Lions

Killer Whale Natural History

- In Alaska, there are resident stocks and transient stocks, with only the transient stocks preying on seals and sea lions.
- Killer whale movement patterns are related to the distribution and movements of their prey.

In Norway, killer whales arrive in the Vesteralen Islands area at the same time as herring (Simila and Ugarte 1991) and in Antarctic waters, in late November, at the same time as minke whales (Budylenko 1981). Condy et al. (1978) noted that the presence of killer whales off Marion Island, in the southern Indian ocean, was synchronized with the hauling out of elephant seals and penguins. Killer whales were observed at Punta Norte, Argentina, only during the breeding season of their southern ocean prey (Hoelzel 1991). In waters off Kamchatka, killer whales concentrated near seal and sea lion rookeries and were seen most often during periods of peak sea lion abundance (Tomlin 1957) Inhabitants of the Commander Islands described the close timing between the arrival of fur seals (Callorhinus ursinus) and killer whales (Tomlin 1957). [P. 4.]

.... Based on the patterns of killer whale predation on species similar to Steller sea lions, a strong case can be made that a higher proportion of pups are killed than is reflected in the questionnaire. We suspect that killer whale predation on sea lion pups and juveniles peaks while the animals are congregated at rookery sites. Several observers reported that killer whales spent more time near haul-out and near-shore areas during the pupping season than during the rest of the year. Baird (1994) found that the majority of predation events he witnessed on harbor seals occurred during the weaning and post-weaning period. [p. 13.]

Killer Whale Predation on Seals and Sea Lions

Stomach Content Analysis

- Analysis summarizes stomach contents analyses from 22 killer whale carcasses from the study area (14 British Columbia, 5 Prince William Sound, 3 Other Alaska) and reviews reports of stomach contents of killer whales from around the world.

- Stomach contents analysis confirms that individuals are specific in their choice of prey and foraging strategies, with fish-eating resident and mammal-eating transient killer whales.

- Of the 22 carcasses from the study area, eight were known transients or whales with stomachs containing marine mammal remains. Steller sea lion remains found in two (25%) including one carcass found in 1992 on Montague Island in Prince William Sound with 15 tags from 14 SSLs (two tags from the same animal). The tags were applied to pups in 1988 and 1989, on Marmot Island, as part of a study by the National Marine Mammal Laboratory.

Killer Whale Population Estimates

Table 4.1 Killer whale population estimates for Alaska and British Columbia, by region.

	POPULATION ESTIMATE (Proportion of Total)			
REGION	Resident	Transient	Offshore	TOTAL
Southeast Alaska, B.C. and Washington	364 (49%)	170 (23%)	200 (28%)	734
Prince William Sound	285 (84%)	55 (16%)		340
Western Alaska [1]	238 (88%)	33 (12%)		271
TOTAL	887 (66%)	258 (19%)	200 (15%)	1,345

[1] Western Alaska is west of 142° W longitude and Southeast Alaska is east of 142° W longitude; source is Barrett-Lennard et al., 1995.

Table — Killer whale population estimates for Alaska.

REGION	Resident	Transient	Offshore	TOTAL
Alaska	717 (49%)	336 (23%)		1,053

Source: Draft EA/RIR for Pacific cod and Steller sea lions, August 23, 2000, p. 69.

Killer Whale Predation on Steller Sea Lions — Simulation

The predation model is a deterministic age-structured Leslie model that corresponds to the model developed by York (1994) to investigate the Steller sea lion population in the Gulf of Alaska.

Key Data

- The number of transient killer whales (250 transients; 125 western and 125 eastern).
- Av. size (3,550 kg) and food intake of killer whales (220,000 Kcal = 73 kg per day).
- Proportion of killer whale diet that is Steller sea lions (depends on abundance of SSLs, range is 8%-15%).
- Initial Steller sea lion population size (100,000 - 200,000).
- Intrinsic growth rate of Steller sea lions (range is 4%-8% with baseline=4%).

Simplifying Assumptions

- Steller sea lion population not limited by its size.
- No numerical responses of killer whales to changes in Steller sea lion numbers.

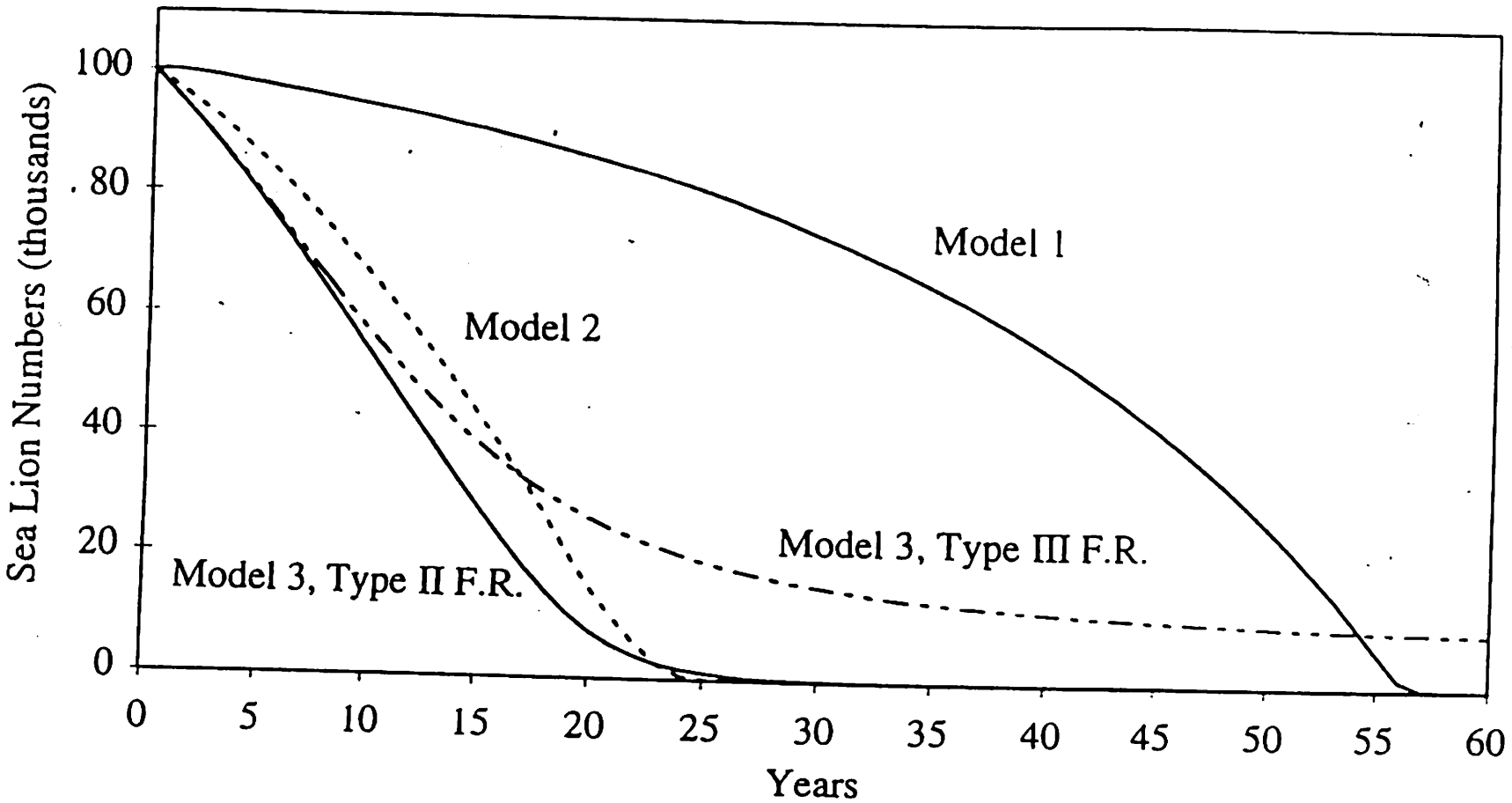


Figure 5.5 Sea lion population trajectories under four predation models (described in text). The following parameter values were used: transient killer whale numbers, 250; killer whale consumption rate, 74 kg/day; initial sea lion numbers, 100,000; sea lion intrinsic population growth rate, 4%; proportion of sea lions in transient killer whale diet, 0.125 for Models 1 and 2, as in Figure 5.3 for Models 3 Type II and 3 Type III.

Killer Whale Predation on Steller Sea Lions — Conclusions

Alaska West of 142° W Longitude

- Approximately 42,500 Steller sea lions and 125 transient killer whales at the end of 1994.
- With the base assumptions and model three, it is predicted that the number of transients is, theoretically, more than that required to cause the sea lion population to decline. With 125 transients, the predicted rate of decline is 3.8% per yr. This compares with an actual rate of decline of approximately 5% per yr.

Area East of 142° W Longitude and North of Washington State

- Approximately 23,200 Steller sea lions and 125 transient killer whales.
- With the base assumptions in the model, it is predicted that killer whale predation should be capable of holding these sea lion populations at a growth rate close to zero.

Killer Whale Predation on Steller Sea Lions — Simulation

In classical predator-prey theory, when the abundance of a prey species declines below a certain level, it becomes unprofitable for a predator to continue to search for that prey. When this occurs, specialist predators may emigrate or die off (numerical responses), and generalist predators may switch to alternate prey (functional response).

Because transient killer whales take a variety of marine mammal prey, it seems reasonable that some form of prey switching would occur as sea lion numbers decline. Harbor seals, known to be important components of the diet of transient killer whales, are a likely alternate prey. Because harbor seals **[sea otters]** are often found in the same areas as sea lions, transients hunting them are likely to be able to continue to take sea lions that would not otherwise be profitable to hunt. Thus a form of apparent competition (Holt and Lawton 1994) may exist, where an increase in harbor seals **[sea otters]** in a local area attracts transient killer whales that in turn cause a decline in sea lion numbers.

If, as described above, killer whales can effectively use harbor seals **[sea otters]** to subsidize a continuing hunt for sea lions, a TYPE II functional response is expected, with high levels of sea lion predation even at low sea lion densities. For this to occur, harbor seals **[sea otters]** would need to be relatively abundant. In western Alaska, however, there is evidence that some harbor seal populations are in severe decline (Castellini 1993, Hoover-Miller 1994). If harbor seals are not abundant, transient killer whales are likely to shift their concentration from sea lions to species that live further offshore, such as dolphins, porpoises, mysticete whales, fur seals, and elephant seals. In this case a TYPE III functional response curve might be expected, where killer whales cease actively searching for sea lions as sea lion abundance declines, but continue to prey on sea lions opportunistically when they are encountered by chance. [pp. 40-41.]

Otter stocks dive

Aleutian whales seen as cause

By MARTHA BELLISLE
Daily News reporter

Sea otter populations throughout the Aleutian Islands, once some of the largest in the world, have plunged about 70 percent this decade and killer whales appear to be cause, federal biologists reported Thursday.

The new numbers, collected during aerial surveys conducted in April, confirmed that the steady drop scientists identified over the past several years is steepening, said Angela Doroff, an Anchorage-based biologist with the U.S. Fish and Wildlife Service.

Though the decline was expected, such a sharp downturn in eight years "is a little jaw dropping," she said.

The dive in the sea otter population follows a steady 95 percent decline over the past 20 years. Only about 6,000 sea otters remain in the Aleutian Islands, down from the 55,000 to 100,000 that splashed about the region in the 1980s, she said.

In 1965, Doroff said, the Aleutian region "was the stronghold for the otter population in the world."

Though it's difficult to say for certain, said Jim Estes, a research biologist with the U.S. Geological Survey in Santa Cruz, Calif., the best available information on the cause of the decline points to killer whales.

Several factors led Estes and other people to this theory, he said in a telephone interview Thursday.

For one thing, "there were no observations of killer whales eating otters until 1990," he said. "Then they became common. We've seen the attacks."

The increased frequency in the attacks coincided with the decline in sea otter populations, said Estes, who has studied sea otters in the Aleutians since the early 1970s.

Another piece of evidence, he said, "was that there are virtually no dead animals during this period of decline." They're disappearing, he said, not dying and washing ashore, which implies they've been eaten.

That the killer whales appear to be killing sea otters is fairly certain, he said. Why they turned to the otters for food is less clear.

It may be that whales have been eating otters all along and a larger orca population meant a bigger take. It could be that the killer whales just happened upon this new treat.

But both of those theories are unlikely, Estes said. He thinks killer whales turned to the otters when the things they normally eat, Steller sea lions and harbor seals, became less abundant.

"The decline of the otters coincides with the sea lions and seals," he said. "The timing fits."

The Steller sea lions in the western Gulf of Alaska were listed as an endangered species in 1997. Their disappearance remains a mystery.

The two most popular explanations for the sea lion and harbor seal decline are ground fisheries and a "regime shift" — the temperature in the ocean increased, Estes said.

"Maybe both," he said. "Nobody's certain."

Biologists who study killer whales scoffed when scientists from the University of California suggested in a 1998 study that the animals were preying on sea otters.

While 1,000-pound sea lions and 250-pound harbor seals are mostly lip-smacking fat, 70-pound sea otters are relatively thin and stay warm with a thick coat of fur. One biologist said switching food sources would be like eating rats instead of cows.

The most convincing evidence, killer whale biologists said, was the eyewitness reports by scientists on the team, who released findings in 1998 documenting the disappearing sea otters and implicating the orcas.

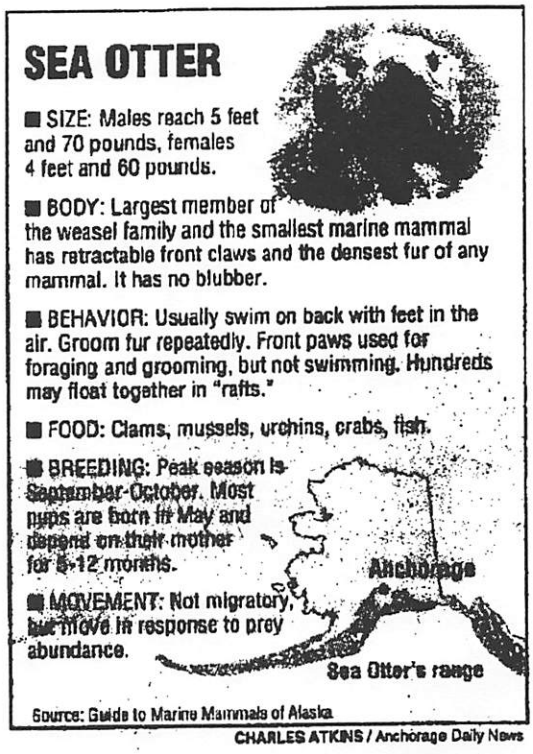
Still, it might take five otters a day to satisfy the appetite of a killer whale, which can grow to 26 feet in length and 8,000 pounds, according to the University of California study.

FRIDAY, JUNE 30, 2000 • www.adn.com

A-10 Friday, June 30, 2000 THE BA

OTTERS: Drop in population

Continued from Page A-1



CHARLES ATKINS / Anchorage Daily News

Under the Marine Mammal Protection Act, sea otters cannot be killed or harassed. But Natives in the Aleutians have an exemption to subsistence hunt the animals, noted Lianna Jack, executive director of the Alaska Sea Otter and Steller Sea Lion Commission.

"But there's very little hunting there for the otters," she said.

The commission, a tribal consortium that co-manages the species with federal agencies, plans to continue small-boat surveys through summer.

"It's a huge decline," she said. "It's something we need to pay attention to and work together on."

Doroff said her agency is considering listing the sea otter in the region as a candidate for the Endangered Species Act or "depleted" under the Marine Mammal Protection Act. Such listings would mean more funding for further studies and to mitigate the population decline, she said.

❑ Reporter Martha Bellisle can be reached at mbellisle@adn.com.

THE BOSTON GLOBE - AUG. 8, 2000

Attack of the killer whales and other mysteries of the deep

Scientists ponder ecological upheaval in the Bering Sea

By Diedtra Henderson
GLOBE CORRESPONDENT

Cuddly sea otters in Alaska's Aleutian Islands have redefined the phrase "sitting duck."

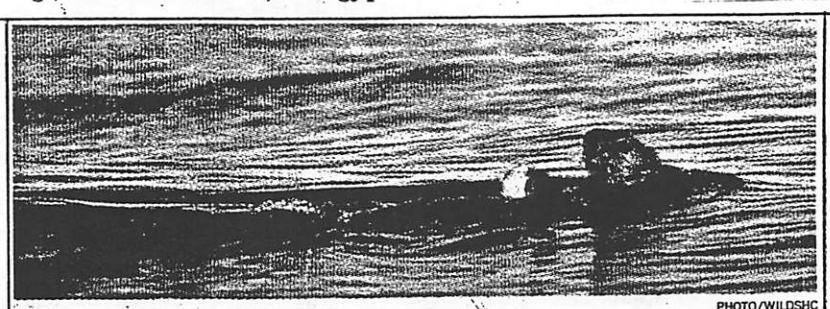
The munchkin sea mammals dive for dinner, then, in a Kodak moment, float on their backs above the kelp forest to eat. Using rocks for tools, they precociously break open mussels and barnacles and delicately extract meat from spiny sea urchins.

Cue up the music from "Jaws." As the ominous "dah-dah-dah-dah" rises toward a climax, an enormous killer whale bursts through the kelp fronds to gobble a sea otter whole.

"It actually looks like darn easy pickings," said Terrie Williams, a biology professor at the University of California at Santa Cruz who has witnessed the startling spectacle.

Something very strange is going on in the Bering Sea, the vast, cold expanse that lies between Alaska and Siberia. Killer whales have suddenly switched from eating big Steller sea lions to itty-bitty sea otters, the equivalent of furry cocktail wienies.

WHALES, Page E5



PHOTO/WILDSHC

Cuddly sea otters have recently become a favorite prey of killer whales off the Alaska coast, a sign of mysterious ecological changes in the Bering Sea.

The diet switch was prompted by the plummeting population of western sea lions, some scientists say. Other marine mammals such as northern fur seals are also doing poorly. And some of the most commercially valuable inhabitants of the sea, king crabs and shrimp, have nearly vanished.

In fact, a federal judge in Seattle is so concerned about the ecological changes that he banished fishermen from harvesting groundfish over a large area of the Bering Sea and the Gulf of Alaska – effective today – in an effort to protect the food supply of the dwindling sea lions. US District Judge Thomas S. Zilly's move, one of the toughest steps ever taken under the Endangered Species Act, is expected to cost fishermen $93 million in lost revenue by the end of the year.

"People are in shock," Chris Blackburn, who represents the fishing industry in Kodiak, Alaska, told the Seattle Post-Intelligencer. "A community on an island: Fishing is what we do."

But Zilly's ruling noted that, without strong actions, the sea lions face extinction after more than 3 million years of inhabiting the North Pacific, including the Gulf of Alaska.

It's not at all clear, however, that humans are to blame in any direct sense for the upheaval in the Bering Sea and the Gulf of Alaska, neighboring water bodies separated by the Aleutian Islands. Although the Exxon Valdez oil spill in 1989 was temporarily devastating, life in the Gulf of Alaska has largely recovered. Likewise, fishing has greatly increased – from just 27,000 metric tons of groundfish in the 1950s caught in Alaskan waters to 2.1 million metric tons removed annually in the 1990s – but it has gone hand in hand with soaring groundfish stocks.

There's a growing consensus among scientists that the population booms and busts may be driven by ecological "mood swings" every few decades that subtly change the salt level, temperature and other climate parameters in the water.

The waters off the Alaskan coast are several degrees warmer and somewhat less salty than they were a few years ago, thanks in large measure to a climate phenomenon known as the Pacific Decadal Oscillation. Under the oscillation's sway, the North Pacific's weather goes from being dominated by atmospheric low-pressure systems to atmospheric high-pressure systems.

At the same time, more dramatic changes in ocean conditions may be due to El Nino events, a warming of a massive puddle of equatorial Pacific waters that affects the weather – and makes news – worldwide. Some scientists believe that humans may be making El Ninos more powerful in recent years by warming up the planet through the burning of oil and other fossil fuels.

Taken together, scientists suspect the climatic changes may be creating boom conditions for some animals while depriving others of their food supplies. That might help explain why populations of Atka mackerel, walleye pollock and jellyfish have increased so dramatically since the 1950s.

"Warmer water ups the metabolism of cold-blooded animals," increasing the amount of food they must eat to survive, explained Tom Weingartner, a physical oceanographer at the University of Alaska at Fairbanks.

At the same time, Weingartner said, the water with the least salt is concentrated heavily near the surface of the water, because fresher water is lighter and tends to float on top of saltier water. The surface water also contains fewer nutrients, making conditions more stressful for marine life, such as phytoplankton, the plants at the base of the food web.

The pattern of marine mammal populations tends to support the notion that the surface waters are less bountiful than they once were. Sea lions, Northern fur seals and harbor seals – the marine mammals suffering the steepest decline mainly – feed near the surface. Meanwhile, deep-diving marine mammals, such as the enormous Northern elephant seals, are prospering.

Yet, Weingartner cautions against easy conclusions. Layers of fresher and saltier water are as difficult to mix as oil and vinegar. A sharp contrast between those two layers can actually help the marine food web by creating strong ocean currents that corral phytoplankton and tiny animals known as zooplankton into tighter pockets for more efficient eating.

"You can't sit down and say if a then b, then c, then d, therefore a decrease in sea lions," Weingartner said.

There's a move afoot – and $12 million in seed money – for a 100 year systemic monitoring of th northern Gulf of Alaska that woul help identify the fingerprint of a ecological shift and, potentially

predict the arrival or disappearance of fish that are valuable to consumers and sea creatures.

"You want to measure a few of these cycles. If they're 20 to 30 years long, you need to measure over 100 years to capture them," Weingartner said.

Already, researchers have spotted changes in the food web that argue in favor of an ecological shift in 1988-1989, with biological winners and losers.

Jellyfish in the eastern Bering Sea took off about 1990 with 10 times more jellies by the end of the '90s.

Red-legged and black-legged kittiwakes on the Pribilof Islands started to increase after 1989 despite feeding differences between the two bird species and despite warmer water temperatures on the surface where red-legged kittiwakes forage for fish by day.

"Really deeply rooted, fundamental processes are being affected, because it's a long ways from atmospheric pressures and water temperatures to a kittiwake chick," said Alan Springer, a research associate professor at the University of Alaska at Fairbanks.

The ominous population crash among the colony of Steller sea lions west of longitude 144 (degrees) west has attracted the most attention and fueled the loudest outrage. In the late 1970s, there were 109,880 adult and juvenile sea lions. By 1996, that dropped to 22,167 animals. Most of the decline occurred after the late 1970s and bottomed out by 1989, Springer said.

Further down the coast, many of the 400 California sea lions that died recently showed weird behavior – they were semi-comatose, suffered muscle tremors, and flopped on their backs more than normal to scratch – that led veterinarians to suspect they had been done in by the poison produced by hazardous algae.

"The suspicion was confirmed when domoic acid was found in the sea lions' blood and urine," said Martin Haulena, a veterinarian at the Marine Mammal Center near San Francisco.

But the Steller mystery in Alaska isn't quite so simple because the remaining sea lions are in pretty good physical condition.

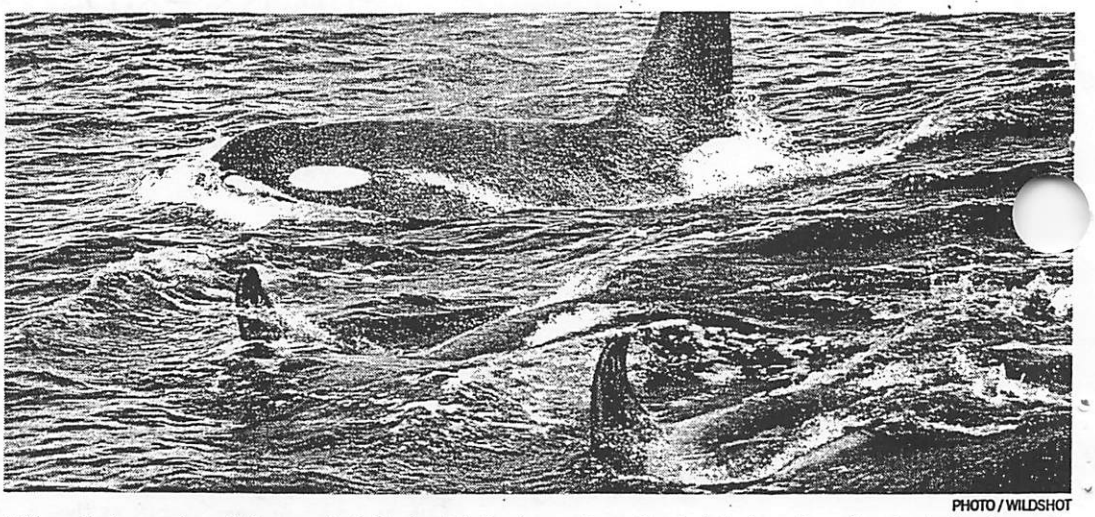


PHOTO / WILDSHOT

Killer whales cruise off the coast of Alaska. Their change in eating habits is a sign of ecological upheaval.

Researchers have cautiously ventured into the cacophony of sea lion rookeries with territorial males calling in bass, females responding in soprano and chocolate brown pups bleating like lost sheep. The sea lions congregate on remote rookeries in summertime to mate and breed with harem males defending territory that makes up an invisible checkerboard.

"Some religious moments we've had on the rookeries with these [sea lions]," said Michael Castellini, a marine biology professor at the University of Alaska at Fairbanks. "It's dangerous. People get hurt."

Researchers have checked off various explanations for the population crash: Disease didn't do it. Pups weren't born doomed; their health and blubber levels were good. The animals' blood didn't contain the telltale proteins and carbohydrates that signal they had gone from routine fasting to starving. But the western sea lions do have signs of immune problems that are consistent with animals in trouble; what's causing the inflammation, however, is not clear.

Studies of sea lion diets have been intriguing, suggesting that, as the animals have fed increasingly on the abundant pollock, they don't add an essential blubber layer nearly as well as they did eating the mix of fish they relied on 30 years ago. Sea lions that gain less weight are less likely to survive to adulthood.

Killer whales, or orcas, are waiting for no man. While scientists work to explain the sea lion mystery, the orcas apparently have simply switched to a high-protein diet as the sea lions became less abundant.

In part because of the orcas' more intensive hunting for sea otters, the number of otters in the 78 islands of the Aleutian chain has dropped from 55,000 to 100,000 in the 1980s to only 6,000, according to a recent US Fish and Wildlife Service survey.

"When you see the killer whales up there, they're cruising around the kelp bed. The otters are just on the water surface," said Williams, the biology professor at the University of California at Santa Cruz.

But sea otters are far less nutritious than sea lions, since they are both smaller and provide fewer calories per serving. A male killer whale can satisfy his daily nutritional needs with five adult male sea otters or seven adult female otters. A female killer whale would need three male sea otters per day or five female sea otters per day.

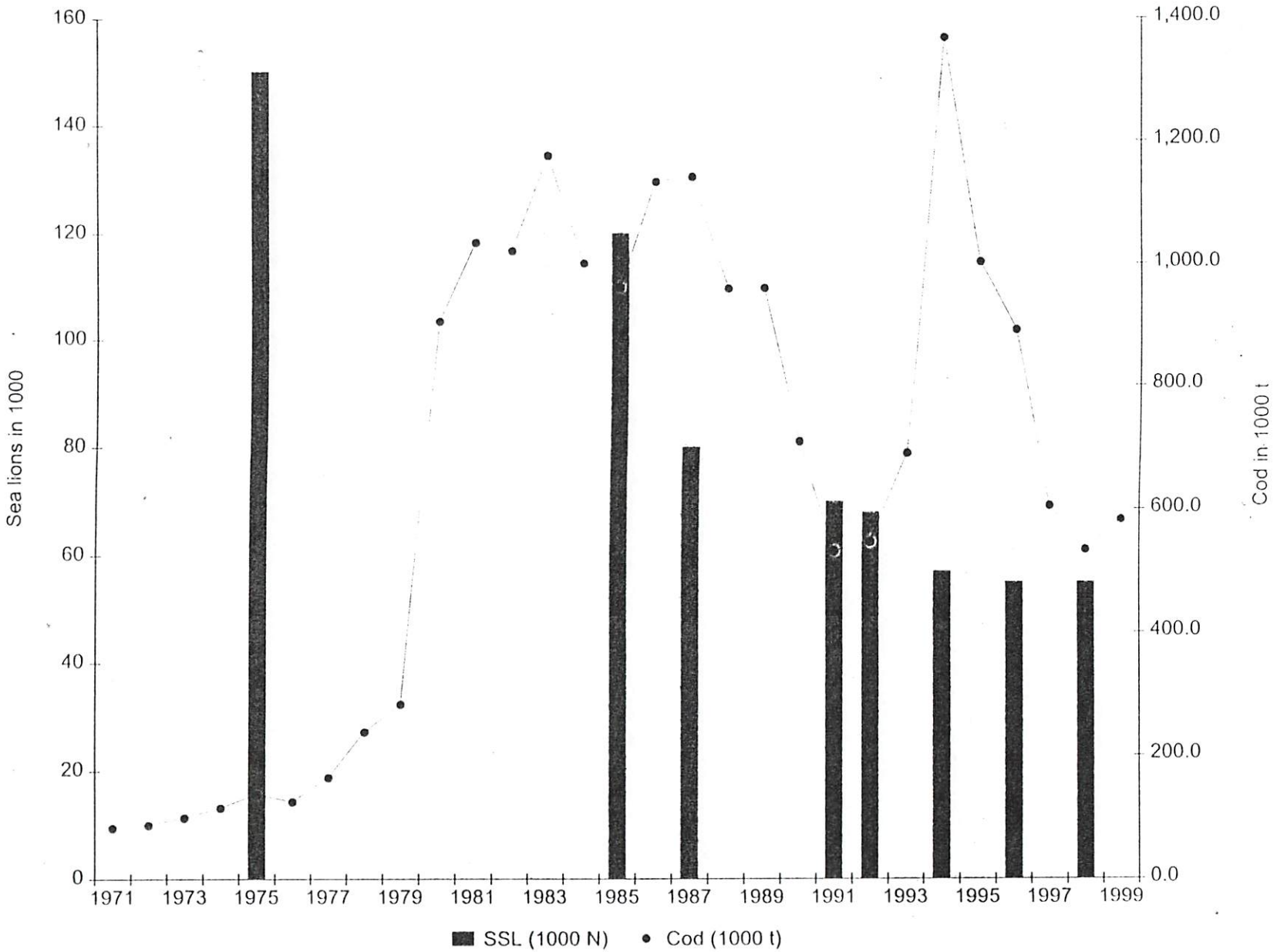
Yet, as the sea lion numbers drop and the orcas chase after the cuddly sea otters instead, the main human victims may be the fishermen, from the Seattle-based Pacific trawl fleet to the remote fishing villages that dot the Alaskan coast.

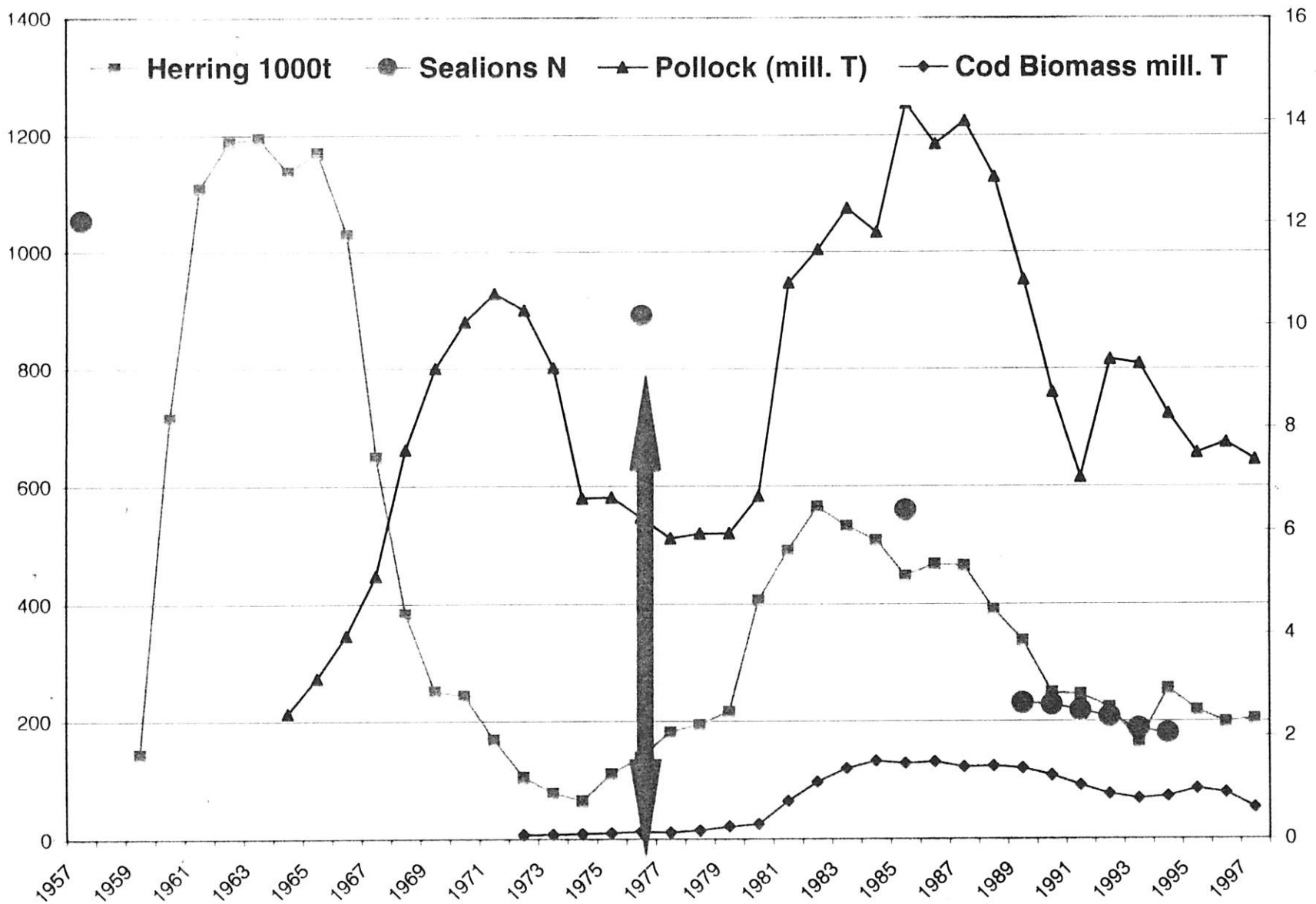
Judge Zilly's closure of the fisheries, announced last month, is supported by conservationists, but fishermen and their allies say they are being unfairly blamed for the sea lions' problems. They argue that the broader ecological cha[illegible] are far more important in th[illegible] lion slump than the fishern[illegible] nets.

"While we recognize the need to protect Steller sea lions," said Acting US Commerce Secretary Robert Mallett, "we're concerned this injunction will have a severe impact on Alaskan coastal communities."

GLOBE STAFF MAP

Beth Stewart
NFB




Herring 1000t
Sealions N
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Aleutian Islands Cod

Most Aleutian Island cod appear to originate in the EBS

- Greatest Abundance in eastern Aleutians.
- Little evidence of reproduction success-almost no cod younger than age 2 in surveys.
- Abundance trend similar to EBS with a lag.
- Tagging and length frequencies (more large cod) suggest oneway movement to the Aleutian Islands for the EBS, similar to pollock and Greenland halibut.

In the Aleutian Islands the shelf shallower than 200 m is nearly entirely encompassed by SSL CH.

Exploitation

Appears in proportion with cod biomass.

1980-1997 survey average biomass =137 Thousand t

Fishery for same period averaged 16 thousand t = 12% of survey biomass.

The Ratio of AI/EBS catch since 1992 is 14%

Western Gulf of Alaska Shrimp surveys (Anderson et al 1997)

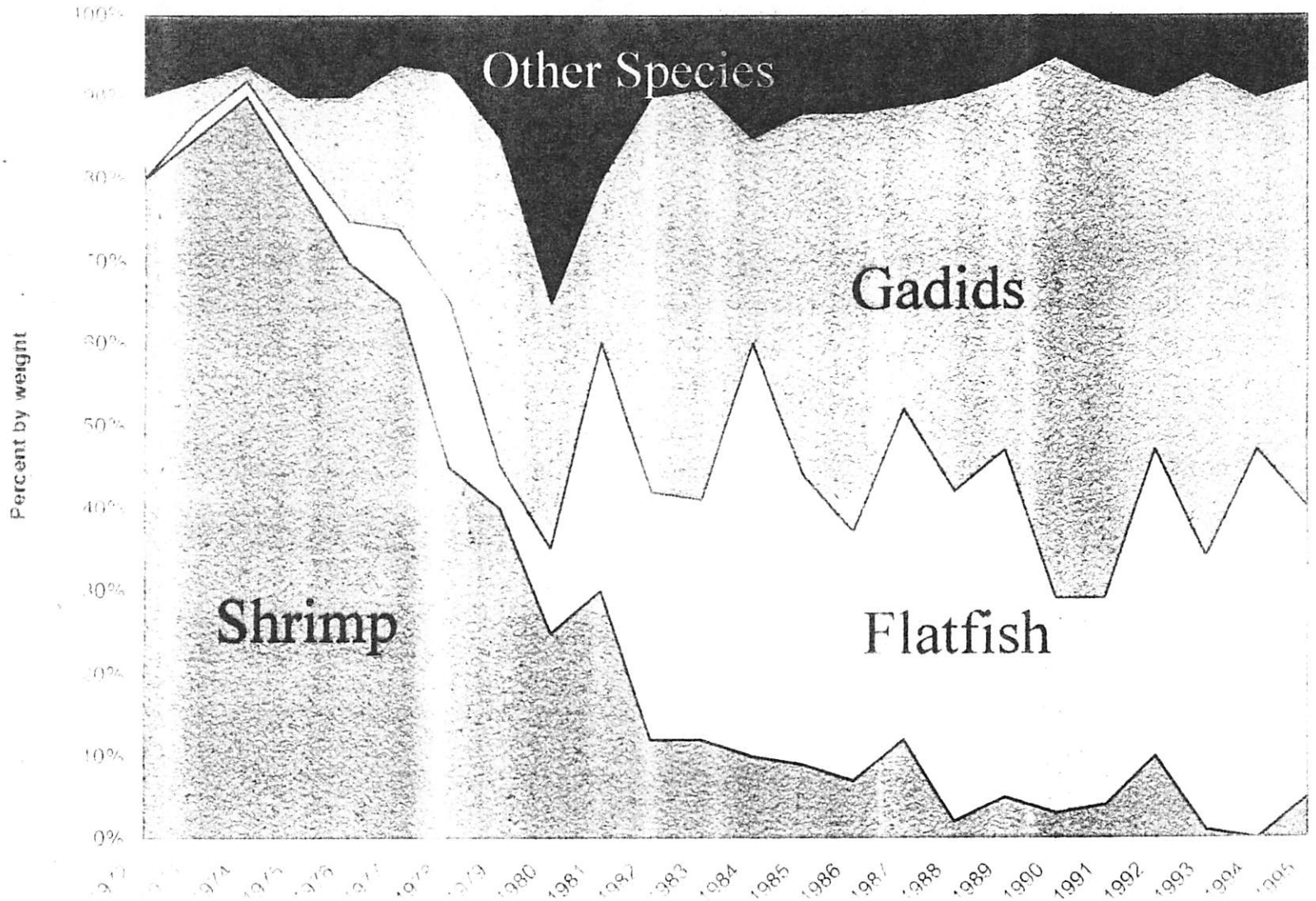


Figure 30. Percent occurrence of prey items identified in Steller sea lion scat samples in summer from 1990-1998.

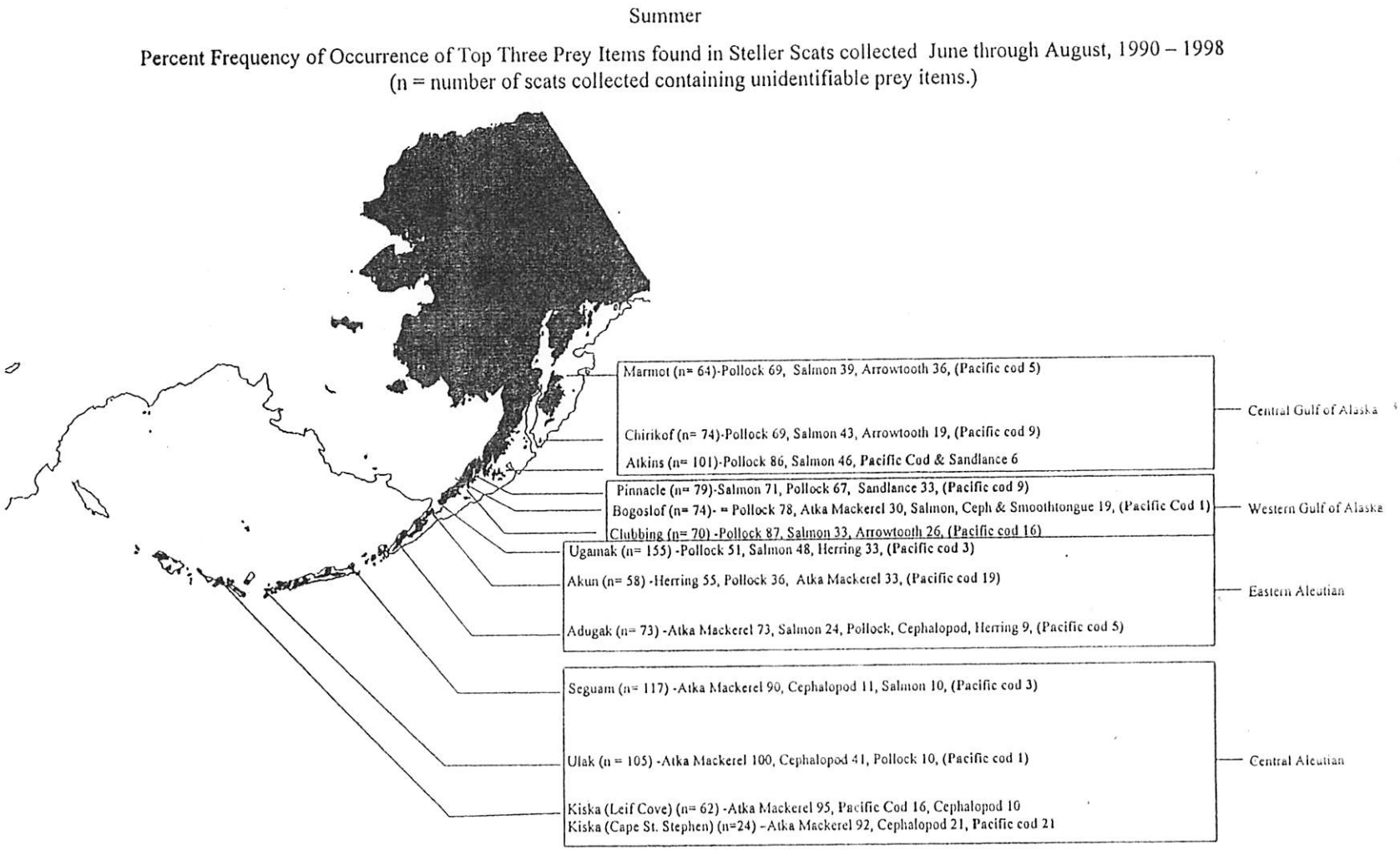
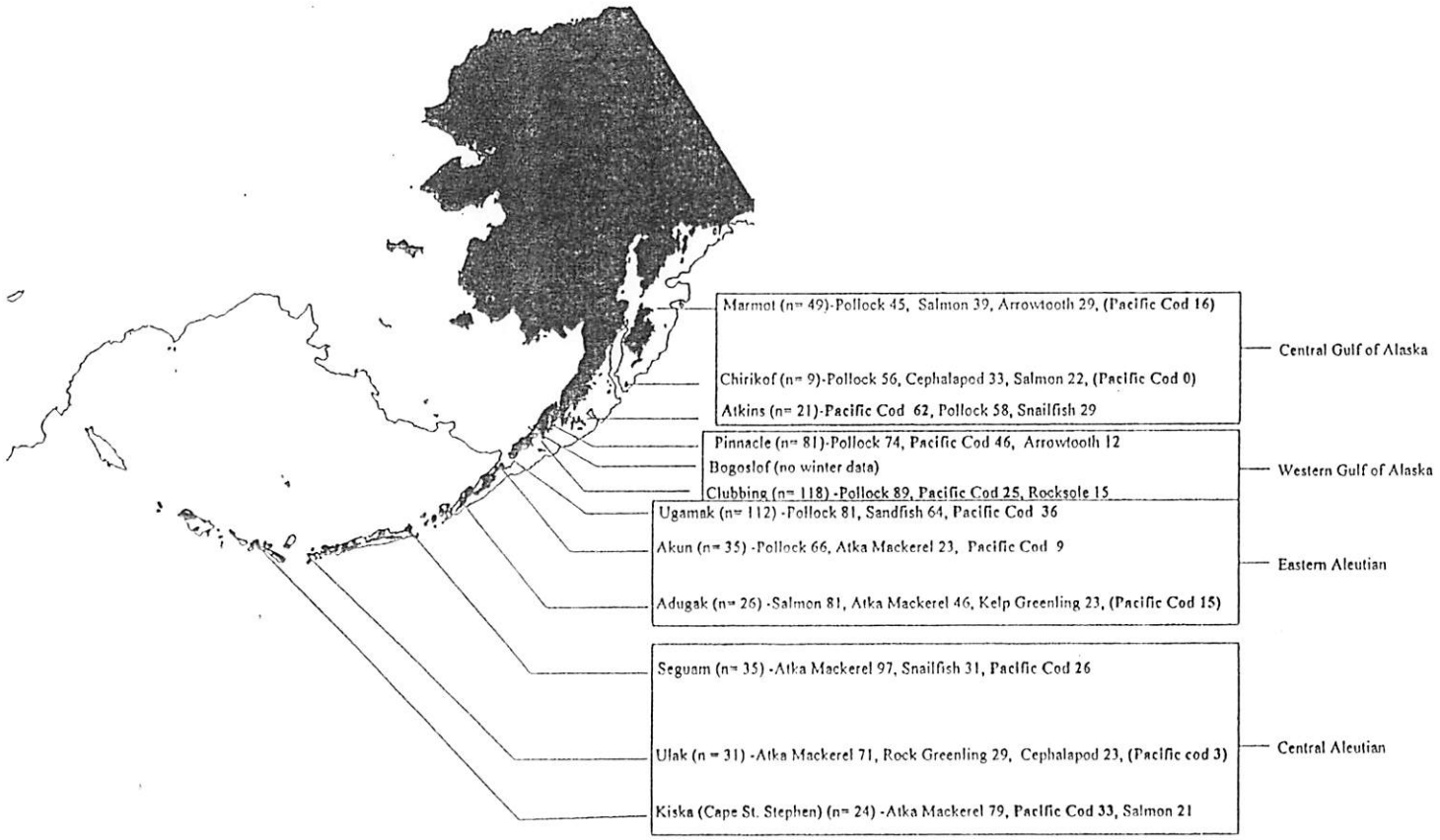
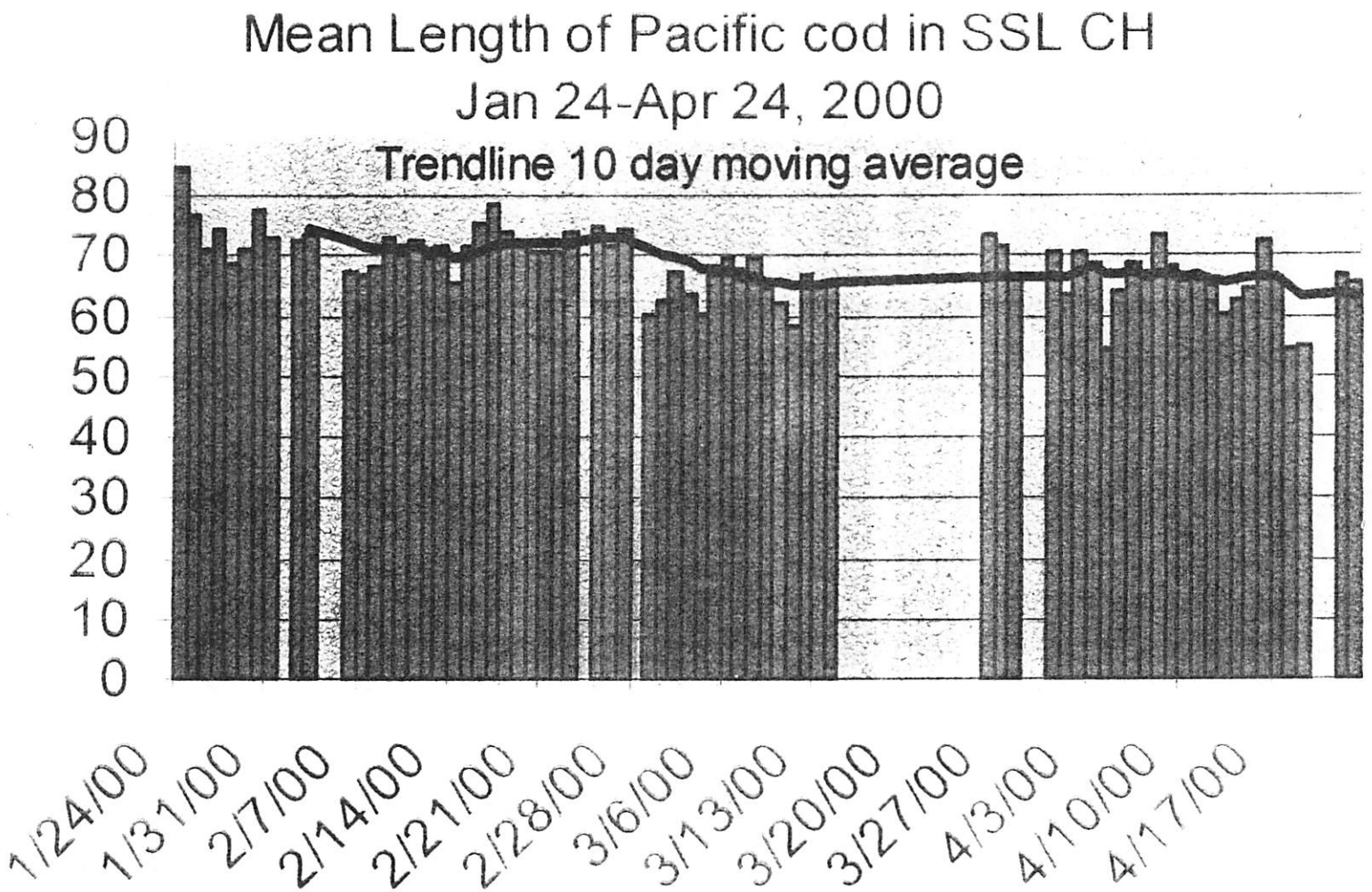


Figure 29. Percent occurrence of prey items identified in Steller sea lion scat samples in winter from 1990-1998.




Mean Length of Pacific cod in SSL CH
Jan 24-Apr 24, 2000
Trendline 10 day moving average
90
80
70
60
50
40
30
20
10
0
1/24/00
1/31/00
2/7/00
2/14/00
2/21/00
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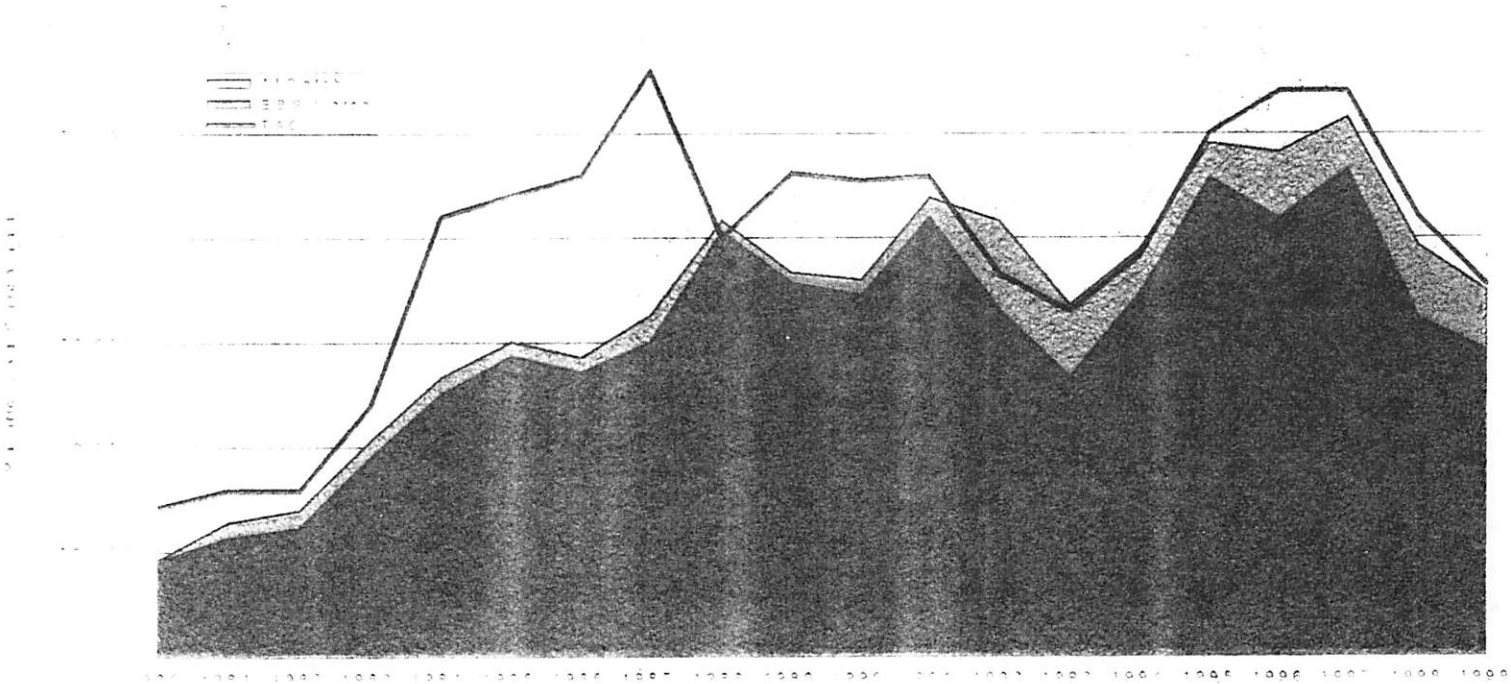
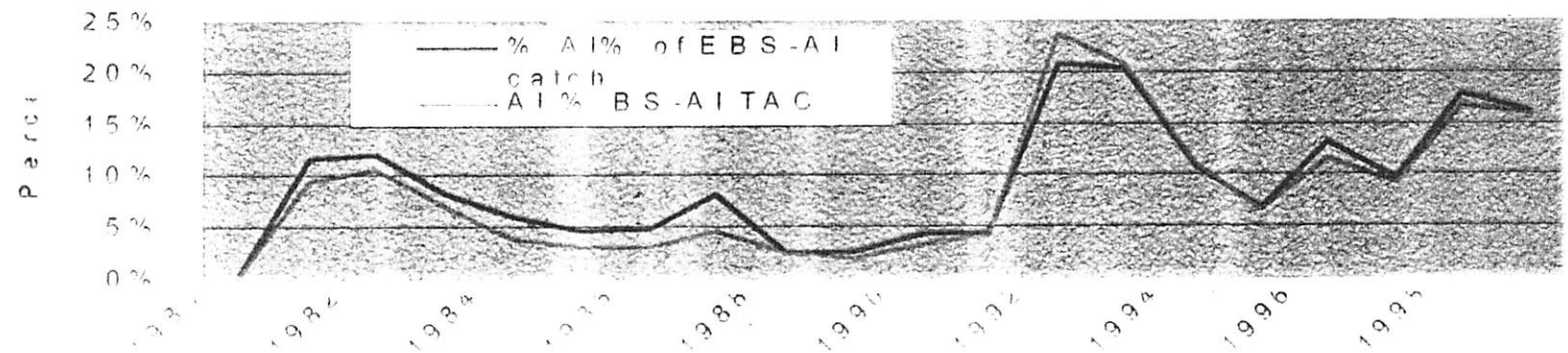


Percentage of EBS-AI catch and TAC in the Aleutian Islands



ALASKA CRAB COALITION

3901 Leary Way N.W. Ste. 6
Seattle, Washington 98107
206 547 7560
206 547 0130 Fax
Email: acc-crabak@msn.com

DATE: August 31, 2000

TO: Mr. Clarence Pautzke, Executive Director
NPFMC
605 West 4th Avenue, Ste. 306
Anchorage, AK 99501-2252

FROM: Arni Thomson, Executive Director

RE: AGENDA ITEM C-2 PACIFIC COD/STELLER SEA LION INTERACTIONS

REQUEST TO MAINTAIN HISTORIC CATCH PERCENTAGE IN BERING SEA/ALEUTIAN ISLANDS CRITICAL HABITAT

Alternatives 2 and 3 of the Draft Environmental Assessment for Pacific Cod and Steller Sea Lions (August 23, 2000) to limit fishing in the Sea Lion Conservation Area (SCA), pose severe consequences for the already economically distressed Bering Sea pot fleet.

- As noted in the summary analysis of catches by gear type for 2000 (attachment), the pot fleet caught its share of the cod allocation (9% of the total TAC), during the winter trimester, since the opilio fishery was delayed until April first. Assuming the fleet's historic catch in critical habitat (CH) has been 77%, 13,145 mt of its Bering Sea catch of 16,918 mt was taken in the CH. In 2001 it is likely if the crab fleet has a season, it will be small and it will be delayed again until April, making the winter months prime time for the pot cod fishery.

- Using the NMFS preliminary cod models (attachment) for allocating cod catches by gear type for 2001, in light of the recommendations under alternative 2, to allow only 40% of the pot sector's annual catch in the first trimester and only 20% of that in CH, pot vessels would be limited to a catch of 1140 mt in Bering Sea CH in the winter of 2001. This equates to 8% of their Bering Sea sector allocation.

- Based on the NMFS cod models and allocation formula, a similar projection can be made for the Aleutian Islands. Pot vessels would be limited to 190 mt in CH, or 8% of their Aleutian Islands sector allocation.

- If pot vessels are required to fish outside CH and the SCA, lengthened travel time and reduced fishing time will make it financially unfeasible for the vessels to fish and return to markets.

- Pot vessels fishing outside critical habitat will be forced into gear conflicts with trawlers, resulting in excessive amounts of lost pots and there will also be increased bycatch of king and tanner crabs.

Weekly Cod Catch inBSAI by Gear Type 2000

	Trawl Metric Tons	% of TAC in of CH	Hook Metric Tons	% of TAC in of CH	Pot Metric Tons	% of TAC in of CH
01/01/00			662			
01/08/00			5061		45	
01/22/00	1324		5797		661	
01/29/00	3016		4973		1664	
02/05/00	5858		4882		2772	
02/12/00	3213		3979		2480	
02/19/00	6242		4441		2981	
02/26/00	5867		4993		4221	
03/04/00	4055		4515		2568	
03/11/00	5610		3789		2686	
03/18/00	7900		279		41	
03/25/00	7795		0.6		2	
04/01/00	7321		2.4		1	
04/08/00	5979		4		0.4	
04/15/00	5438		0.5		6	
04/22/00	4697		26		0.05	
04/29/00	2720		12		2	
Total Ist Tri	**77035**		**43416.5**		**20130.5**	
BS Catch	**56272**		**37034.5**		**16918.5**	
BS Catch in CH	**36211.0**	**60%**	**7906.9**	**21.30%**	**13145.6**	**77%**
AI Catch	**20763**		**6382**		**3212**	
AI Catch in CH	**18095.0**		**5794.9**		**3035.3**	
Weekly Average Catch	**3600/15wks**		**4717/9wks**		**2000/8wks**	

Alaska Marine Conservation Council
P.O. Box 101145 • Anchorage, Alaska 99510
(907) 277-5357 • (fax) 277-5975
amcc@akmarine.org • www.akmarine.org

September 7, 2000

Chair
c/o Clarence Pautzke, Director
North Pacific Fishery Management Council
605 West 4th Ave, Suite 306
Anchorage, AK 99501

Dear Chair of the North Pacific Fishery Management Council,

Alaska Marine Conservation Council (AMCC) is very concerned both about the health of the North Pacific ecosystem, the Steller sea lion, and the coastal communities whose local fleets depend upon fishing. We are dismayed that federal mismanagement of the groundfish fisheries in Alaska's waters has pushed our fishing industry into the current crisis situation. AMCC believes that a more refined, proactive approach to managing the groundfish fisheries may allow some of our cod fleets to keep fishing; National Marine Fisheries Service's (NMFS) broad brush closure approach does not achieve this goal.

AMCC is committed to promoting management alternatives that augment the recovery of the Steller sea lion, while accommodating fisheries that have been adapted as needed to meet sea lion conservation goals. We recommend that the Alaska Board of Fisheries policy "Guiding Principles for Groundfish Fisheries Management," adopted in December of 1996, serve as guidelines in achieving these conservation management objectives (attached).

We understand that NMFS scientists concur that some fishing may occur within critical habitat without having significant negative impacts on the forage base of Steller sea lions. We feel that both fixed gear and trawl fishery management may need to be adapted to meet sea lion food needs. For example, modifying fisheries to accommodate Steller sea lions may include:

- Seasonal adjustments (allow fishing when a diverse food base is abundant);
- Spatial dispersal of fishing vessels in accordance with their impact on the forage fish population;
- Regulation of fishing power in critical habitat, through mechanisms such as vessel size limits, gear restrictions, horsepower, etc.

Regardless of what gear and seasonal framework is adopted for cod fishing, it is imperative that the collateral impact of all fisheries occurring within critical habitat be assessed, including the effects of gear on fish habitat, as well as the direct, quantifiable impacts of biomass removal.

We do not believe this issue justifies immediate federal legislation to proceed with broad-scale rationalization of the Gulf of Alaska groundfish fishery. At this point in the Congressional session, any legislative action would be conducted quickly and without enough opportunity for public input.

We believe it is important that fishery managers be proactive and take a comprehensive approach towards Steller sea lion recovery, rather deal with each species in a piecemeal fashion. We hope the North Pacific Council leads the National Marine Fisheries Service toward a more comprehensive, ecosystem-based management regime for groundfish fisheries. Pollock and cod are not the only foods needed by Steller sea lions. Bering Sea/Aleutian Island and Gulf of Alaska fisheries should be managed to assure that sea lions have access to a diversity of forage fishes, especially in the winter months.

Sincerely,

Steve Fish (KWD)

Steve Fish
Chair

Attachment 7

GUIDING PRINCIPLES FOR GROUNDFISH FISHERIES MANAGEMENT

With state groundfish management expanding to cover the groundfish resources of the state in state waters, the Board of Fisheries (Board) will receive, over time, proposals for these fisheries. The Board will, to the extent practicable, consider the following guiding principles when taking actions associated with the adoption of regulations regarding groundfish fisheries:

1. To conserve the groundfish resource to insure sustained yield which requires that the total allowable catch () in any fishery be based upon the biological abundance of the stock; and

2. To minimize bycatch of other associated fish and shellfish and to prevent the localized depletion of stocks; and

3. To protect the habitat and other associated fish and shellfish species from non-sustainable fishing practices; and

4. To provide for slower harvest rates by methods and means and time and area restrictions in order to ensure adequate reporting and analysis which is necessary for management of the fishery; and

5. To extend the length of fishing seasons by methods and means and time and area restrictions in order to provide for the maximum benefit to the state and to regions and local areas of the state; and

6. To harvest the resource in such a manner so as to maximize the quality and the value of the fishery product; and

7. To use the best available information presented to the Board and to work cooperatively with the North Pacific Fisheries Management Council and other federal agencies associated with groundfish fisheries.

Adopted into regulation by the Alaska Board of Fisheries
Dec. 14, 1996

Stump / Stern
C.2

SPATIAL DISPERSION

Rookeries and Haulouts:

0-3 nmi	3-10 nmi	10-20 nmi	Beyond 20 nmi
no fishing zone around rookeries and haulouts	pots*, jigs, and small longliners (<60 ft)	pots, jigs, small long-liners and catcher long-liners >60 ft.	pots, jigs, small longliners, catcher longliners, freezer longliners, and trawlers

* 60 pot/vessel limit

Aquatic Foraging Areas:

- Prohibit cod trawling in designated aquatic foraging habitat.
- Cap fixed gear catches at a conservative percentage (e.g., 10%) of survey cod biomass within the foraging area.

Other Spatial Measures:

- Seasonal exclusive area registration
- Use Sea Lion Conservation Area (SCA) instead of critical habitat as the management area for purposes of cod regulations in the Bering Sea
- Establish separate Bering Sea and Aleutian Islands TAC apportionments
- Distribute Gulf of Alaska TAC across management areas 610, 620, and 630
- Distribute Aleutian Islands TAC across management areas 541, 542 and 543
- Distribute Bering Sea TAC in the SCA, east of 170W long. and west of 170W long.

TEMPORAL DISPERSION

Bering Sea, Aleutian Islands and Gulf of Alaska Fishing Seasons:

SEASON START DATES	PERCENT ANNUAL TAC
A.....Jan	25%
B.....Apr	25%
C.....Jun	25%
D.....Sep	25%

Concurrent BS, AI and GOA seasons
Two-week stand-downs
No rollovers

Jay Stinson
Mike Martin
C-2

C-2 Steller Sea Lion and Pacific Cod Interactions

PROPOSAL A

WE BELIEVE THE CURRENT DRAFT ENVIRONMENTAL ASSESSMENT IS ARBITRARY AND CAPRICIOUS. OUR BELIEF IS SUBSTANTIATED BY THE SSC COMMENTS AND BY THE COMMENTS OF THE AP IN THEIR SEPTEMBER MEETING MINUTES. NIETHER THE SSC OR THE AP SHOWED CONFIDENCE IN THE FINDINGS OF THE DRAFT EA.

GULF OF ALASKA TRAWLERS REALIZE THE RISK OF A CONTINUED COURT INJUNCTION IN OUR OPPOSITION TO THE ACCEPTENCE OF A FLAWED, INCOMPLETE AND INACCURATE EA.

The following is a proposed road map for accommodating different aspects of effective, legal and scientific components entailed in developing a comprehensive approach to the management of Steller Sea Lions absent the finding of Jeopardy.

I. Suggested process:

1. Draft a letter to the Secretary of Commerce indicating that National Marine Fisheries Service and the State of Alaska, with guidance from the North Pacific Fisheries Management Council will develop a comprehensive Environmental Assessment / Biological Opinion that is complementary to the FMP.
   (Note: the SSC has conclusively stated that two months is not enough time to research and develop a comprehensive EA).

2. FMP to include the development of a comprehensive rationalization plan for the Gulf of Alaska.

3. Table current draft EA and proposed Gulf of Alaska RPA's until a comprehensive, scientifically sound document can be developed.

4. Provide genetic information, which supposedly delineates the Eastern and Western Breeding Stocks of Steller Sea Lions.

5. Request NMFS to provide a current genetic analysis of the supposedly discrete breeding stocks of Steller Sea Lions.

II. Short term Objectives

A. Establish a NMFS marine mammal field biologist position to be stationed at the Near Island Research Facility.
It is apparent that current environmental, predation, and inter-specific foraging competition dynamics need to be monitored and documented in real time by the scientists involved in the recovery plan. That is difficult to do on a continual basis while based in Seattle.

B. Reactivate the Sea Lion Recovery Team including University, ADFG, and independent marine mammal scientists as well as other marine experts.

1. Give the recovery team autonomy.

2. Task the recovery team to:

a. Develop an adaptive management plan for the recovery of Steller sea lions which includes scientific controls and a method of quantifiable efficacy.

b. Develop an integrated scientific based strategy for sea lion research.
Oceanography, marine ecology, and socio/economic concerns should be considered in a comprehensive management approach.

III. Development of final actions to be phased in over three years:

A. Rationalize all federal fisheries in the GOA. While managing our fisheries for the recovery of SSL, other issues such as bycatch reduction, safety at sea, allocation, community stability, and the overall health and long term sustainability of our fisheries resources need to be considered in concert with any possible future RPA's. Negative consequences derived from both pollock RPA's and the recent court injunction indicate that sea lion measures need to by established in concert with fisheries management plans.

We would also request that the State of Alaska assist with the management of Steller Sea Lions by:

A. Developing analysis of SSL Population Dynamics during the 1990's to project if the population is in jeopardy given the past decade trend.

B. Continuing support for research on the long-term biological health of Steller Sea Lions.

C. Supporting increased use of ADFG marine mammal biologists to do parallel research in conjunction with NMFS.

D. Conducting a comprehensive scientific peer reviewed analysis on the theory and degree of food competition between Steller Sea Lions and commercial fisheries.

E. Establishing a leading role in the development of a comprehensive rationalized fisheries management plan for the Gulf of Alaska which will support the sustainability of our fisheries resources, marine mammals and the well being of our coastal communities.

F. Monitoring current environmental and climatological dynamics that suggest the onset of a change in the regime of the Central Gulf of Alaska.

Proposed by:

Jay E. Stinson and Michael Martin

Supported by: Alaska Draggers Association

Western Gulf of Alaska Fisherman

Midwater Trawler Cooperative

United Catcher Boats

IVERSON
C-2

ADAK – ALEUTIAN ISLAND

General comments pertaining to BSAI

- Groundfish density is the highest in the world
- Cod is at historic high Biomass level (1,2 mill ton)
- During the depressed P-Cod Biomass levels in the 50's (0,1 mill ton) Stellar Sea Lions was thriving.
- We have heard form Sea Mammal expert (John Burns) and others, that there is feed competition between P-Cod and Sea Lions. This should indicate that the right remedy during this historic high biomass level of P-Cod should be to increase the TAC for P-Cod in order to help the Stellers.

Special circumstances pertaining to Adak only

- 90% of cod delivered to Adak is above 10 lbs and 62% is above 16 lbs. This mean that 80-90% of the cod fished at and around Adak is larger than the cod NMFS claims to be consumed by Stellers.
- We have seen studies proving that there clearly is a feed divide at 170 deg.West (Island of Four Mountains) which prove that Stellars are almost exclusively feeding on Atka Mackerel west of 170 W.
- Our jig fishermen's in Adak is complaining all the time about the high levels of Atka Mackerel as they have a very hard time getting through the Mackerel and down to the bottom where the P-cod is. This should indicate strongly that the main feed for Stellars in the Western Aleutian is in tact and healthy.
- AI has been closed to Pollock fishing since 1998, so all Pollock is left on the table for the Stellars to enjoy.
- Halibut by-catch is virtually non-existing in the Aleutian Island, so by closing the fisheries in the Aleutians and thereby moving the fisheries in to the Bering Sea, by-catch numbers will increase dramatically.

- All Stellar Rookeries has already been closed with 20 n.mile circles.

- In the 1200 n.mile stretch of country, from 170 west to the Russian boarder called the "Western Aleutian Islands", there is only 13 Stellar rookeries.

- AI has very little productive shelf outside 3 n.mile, due to the very narrow ridge the Aleutian Island chain is sitting on.

- Adak is virtually totally dependent on the cod fisheries, as 79 % of our production in 1999 was P-cod.

- Adak is also very dependent upon a small trawl fishery, as the new LLP program effectively has closed the AI for Pot fishery. There is very few Pot boats qualifying under the new LLP program.

From what we have heard from Ocean Biologists, Sea Mammal experts, fishermen's and countless other experts and observers during this meetings, we conclude that the reason for the Stellar Sealion decline is clearly pointing towards a regime shift in nature rather than having anything to do with the very sustainable and healthy fisheries taking place in Alaskan waters. A fishery that has taken place for 100 years now and been so sustainable and healthy that it has left Alaska with the highest density grounfish biomass in the world as of today, a remarkable achievement.

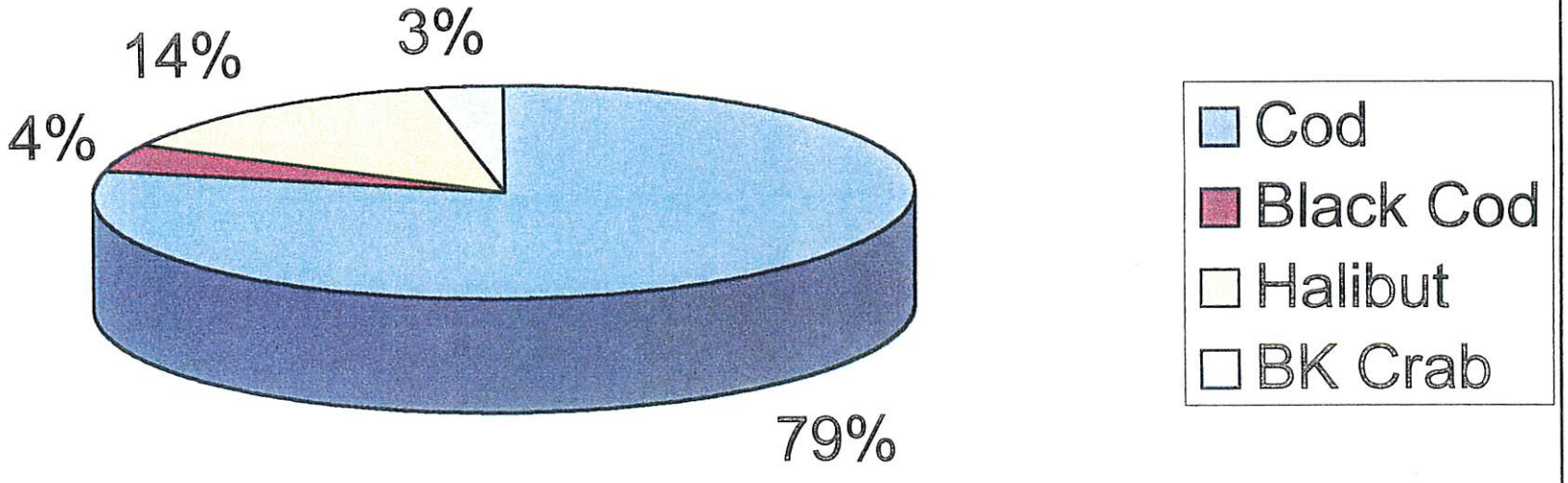
Based on above we do not see any reason and/or effect towards rebuilding of the Stellar Sea Lions population by closing or restricting the P-Cod fisheries.
We are therefore urging the Council to decide on "No Jeopardy", alternatively we are asking for proposal # 1that is a status Quo.

Anchorage September 9, 2000

From:
Norquest–Adak Inc.
100 Supply Road
Adak, AK 99546

To:
Mr. David Benson
Chairman
NPFMC

Adak Deliveries 1999 by species



Groundfish Forum Pain Sharing Proposal

[redacted] pain-sharing formula: Option One

The following formula can be used to calculate equal "sharing" by all of the sub-sectors of the "pain" resulting from modifications to the cod fishery that include limits on cod harvest during an A season and/or cod harvest inside critical habitat (CH).

In order to calculate each sub-sector's A season and CH allowance in a modified cod fishery, the formula determines their relative dependence on A season / CH fishing using the historical percentages of the sub-sectors' cod harvest by season and area provided in the BSAI cod model as posted on the NMFS web site. By applying each sub-sector's A season and CH percentage to its respective TAC apportionment and then calculating the percentage that the resulting number for each sub-sector represents of the total for all sectors, the formula calculates the percentage of the cod TAC that should be apportioned to each sub-sector for its A season and CH limits.

For example, assume sub-sector X has a TAC apportionment of 1000 metric tons and has historically harvested 50% of its catch in A season and 50% of its A season catch in CH. Sub-sector Y also has an apportionment of 100 tons but it harvests 75% of its catch in A season and 100% of its catch in CH.

The relative historical dependence on A season for X and Y is calculated as follows:

X:	1000 mt x .5 = 500 mt	Y:	1000 mt x .75 = 750 mt
	500 / 1250 = 40% of A Season TAC		750 / 1250 = 60% of A Season TAC

The relative historical dependence on CH during A season is calculated similarly:

X:	500 mt x .5 = 250 mt	Y:	750 mt x 1= 750 mt
	250 / 1000 = 25% A CH TAC		750 / 1000 = 75% of A CH TAC

The functions described above will calculate the equal "sharing of pain" resulting from reductions in directed cod harvests allowed during A season and within CH. To do so, you would substitute the various sub-sectors (trawl CV, trawl C/P, jig, freezer longliner, pot, and longline CV) for X and Y in the example above. Those sub-sectors' historical A season percentage would be substituted for the 50% and 75% used in the first set of calculations, and the A season CH percentage for the 50% and 100% used in the second set.

[redacted] pain-sharing formula Option Two:
Same conceptual approach as Option One except that the historical dependence "proportional factor" on CH fishing during the A season is multiplied by historical catch per sector and sub-sector instead of on sector and sub-sector TAC.

* Sub-option for 1+2 above - vessels <60ft = no restrictions on CH fishing percentage.

TONY KNOWLES
GOVERNOR

P.O. Box 110001
Juneau, Alaska 99811-0001
(907) 465-3500
Fax (907) 465-3532

STATE OF ALASKA
OFFICE OF THE GOVERNOR
JUNEAU

September 11, 2000

The President
The White House
Washington, DC 20500

Dear Mr. President:

I seek your help in restoring a safe and viable small boat commercial fishery in Alaska by taking steps to end an injunction that forces Alaska fishermen to venture more than 20 miles offshore in order to support their families. This injunction, intended to protect populations of Steller sea lions, actually threatens the lives of Alaska fishermen by forcing them to work in more dangerous, offshore waters and can be lifted by completion of a comprehensive biological opinion by the National Marine Fisheries Service (NMFS).

Alaska commercial fishermen bear the tragic distinction of having the nation's highest occupational mortality rate. According to a 1991 report by the National Institute for Occupational Safety and Health, "fatalities in the (Alaska) commercial fishing industry are among the highest industry specific rates in the United States." Overall, Alaska fishermen face a workplace mortality rate that is 20 times the national average, and that rate is highest—more than 50 times the national average—among those who fish farthest from shore. This is largely due to cold waters, high winds, treacherous icing conditions, seasonal darkness, and remoteness of the isolated fishing grounds.

Although improvements in technology, training, and response capabilities have helped improve this situation, a recent decision in a lawsuit, triggered in part by the lack of action of a federal agency, threatens to reverse this trend. On July 19, U.S. District Court Judge Thomas Zilly in Seattle issued an injunction prohibiting any trawl fishing in critical habitat areas for the Steller sea lion. This forces small boat fishermen from Alaska's many coastal fishing ports to travel more than 20 miles offshore—into far more dangerous waters—before they can cast their nets.

The injunction remains in effect until NMFS completes a comprehensive biological opinion (BiOp) that meets the legal requirements of the Endangered Species Act (ESA). Although I understand NMFS will attempt to issue a sufficient BiOp by its October 31 deadline, on two previous occasions Judge Zilly ruled that NMFS failed to provide an adequate analysis. In his July 19 order, Judge Zilly noted that the ESA requires NMFS to prepare a comprehensive biological opinion and that, "NMFS's failure to do so goes beyond a technical or de minimus violation, but constitutes a substantial violation of the requirements of the ESA."

On May 9 and again on August 3, 2000, I wrote to the Secretary of Commerce expressing the State of Alaska's concerns over this litigation. On both occasions, I stressed the critical

importance of the affected fisheries to many Alaska communities, fishermen, and their families and urged the Secretary to ensure that NMFS expeditiously complete the needed biological opinion.

It is crucial to the State of Alaska that NMFS now devote all of the resources necessary to produce a scientifically valid BiOp that will allow the injunction to be lifted. Your leadership is required to ensure NMFS dedicates appropriate staff and resources to this effort. Once that objective is met, NMFS should develop a recovery strategy for Steller sea lions, recognizing the role of adaptive management in guiding a science-based approach to sea lion recovery, sustainable fisheries, and marine conservation. The State of Alaska is prepared to participate in this effort. I have already named a Steller sea lion recovery team of top scientists, fishermen and other stakeholders.

In resolving this issue, the federal government must take steps to protect and sustain the economies of coastal fishing communities. Particular attention must be paid to maintaining fishing opportunities for the resident small boat fishing fleet. The safety of these fishermen is a paramount concern.

During a recent trip to Kodiak, among the top fishing ports in the nation, I was reminded of the peril faced by fishermen and women as they harvest the bounty of the seas. A memorial there records the names of fishermen lost at sea and I resolved to take whatever steps are necessary to keep names from being added to that tragic list. Today, I ask you to do the same, by urging NMFS to complete a biological opinion that helps restore sea lion populations and restores a safe and viable fishery for Alaska small boat fishermen.

Sincerely,

Tony Knowles
Governor

cc: George Frampton, Chair of Council on Environmental Quality
The Honorable Norm Minetta, Secretary of Commerce
Ms. Penelope D. Dalton, NMFS
The Honorable Ted Stevens
The Honorable Frank Murkowski
The Honorable Don Young
John W. Katz, Office of the Governor, Washington, D.C.

State of Alaska

Office of the Governor

Tony Knowles
Governor
P.O. Box 110001
Juneau, Alaska 99811-0001

NEWS RELEASE

Bob King
Press Secretary
Claire Richardson
Deputy Press Secretary
907-465-3500
FAX: 907-465-3533

FOR IMMEDIATE RELEASE: September 11, 2000 00-237

KNOWLES APPEALS SEA LION RULING CITING SAFETY CONCERNS

Seeks Presidential Action on Fishing Ban; Names Sea Lion Recovery Team

Saying the livelihoods and safety of Alaska fishermen are at stake, Gov. Tony Knowles today announced three state actions in response to a poorly considered decision by a federal judge, and the irresponsible inaction of a federal agency.

Knowles announced today he will join fishermen appealing a Seattle judge's decision to ban most trawling within 20 miles of shore in order to protect Steller sea lions. Knowles also announced he was seeking President Clinton's personal intervention to help overturn an injunction in the case, and he is naming a team of scientists and stakeholders to find an alternative strategy to restore sea lion populations while protecting fishermen and coastal communities.

The actions come after Seattle federal judge Thomas Zilly last month prohibited all trawl fishing in areas designated as critical habitat for Steller sea lions until the National Marine Fisheries Service (NMFS) produces a required biological opinion. Intended to protect sea lion populations, the injunction forces small-boat fleets in Kodiak and other coastal communities to fish more than 20 miles from shore where weather and sea conditions are some of the worst and most dangerous on earth.

"In his decision, the judge refused to consider the impacts of lost fishing opportunities and the dramatically increased risks to the local fishing fleets and their communities," Knowles said. "The impacts of this decision are being felt right now in terms of the personal safety of the Alaska small boat fishermen and the economic viability of the communities that depend on these fisheries."

Knowles directed Attorney General Bruce Botelho to join fishermen in seeking an expedited appeal of the Zilly decision in the 9th Circuit Court. "Since the evidence only demonstrated a potential harm to sea lions, the court should have considered the irreparable harm the fishing closure will have on coastal communities and the small-boat fleet," Knowles said.

-more-

The letter to President Clinton is the third letter the Administration has sent to the federal government urging action by NMFS to complete the required comprehensive biological opinion that meets the legal requirements of the Endangered Species Act.

"On May 9 and again on August 3, I wrote the Secretary of Commerce and stressed the critical importance of these fisheries to many Alaska communities, fishermen, and their families," Knowles said. "Although I understand NMFS will attempt to issue a sufficient opinion by its October 31 deadline, on two previous occasions NMFS failed to provide an adequate analysis. In his order, Judge Zilly noted that NMFS's failure to do so 'constitutes a substantial violation of the requirements of the Endangered Species Act'."

Knowles asked the President for his personal leadership on this issue to help lift the injunction and develop a recovery strategy for Steller sea lions. "This strategy must recognize the role of adaptive management in guiding a science-based approach to sea lion recovery, sustainable fisheries, and marine conservation," Knowles said. "And the federal government must take steps to protect and sustain the economies of coastal fishing communities and the safety of the affected small boat fishermen."

Knowles also announced formation of a state Sea Lion Restoration Team of scientists and stakeholders to develop an alternative management strategy for protecting the Steller sea lions that allows sustainable fishing to continue.

"Their mission is three-fold," Knowles said. "First, work to restore healthy, sustainable populations of Steller sea lions so they can be removed from the federal threatened species list; second, promote scientific research into the cause of sea lion population declines; and third, employ the principle of adaptive management."

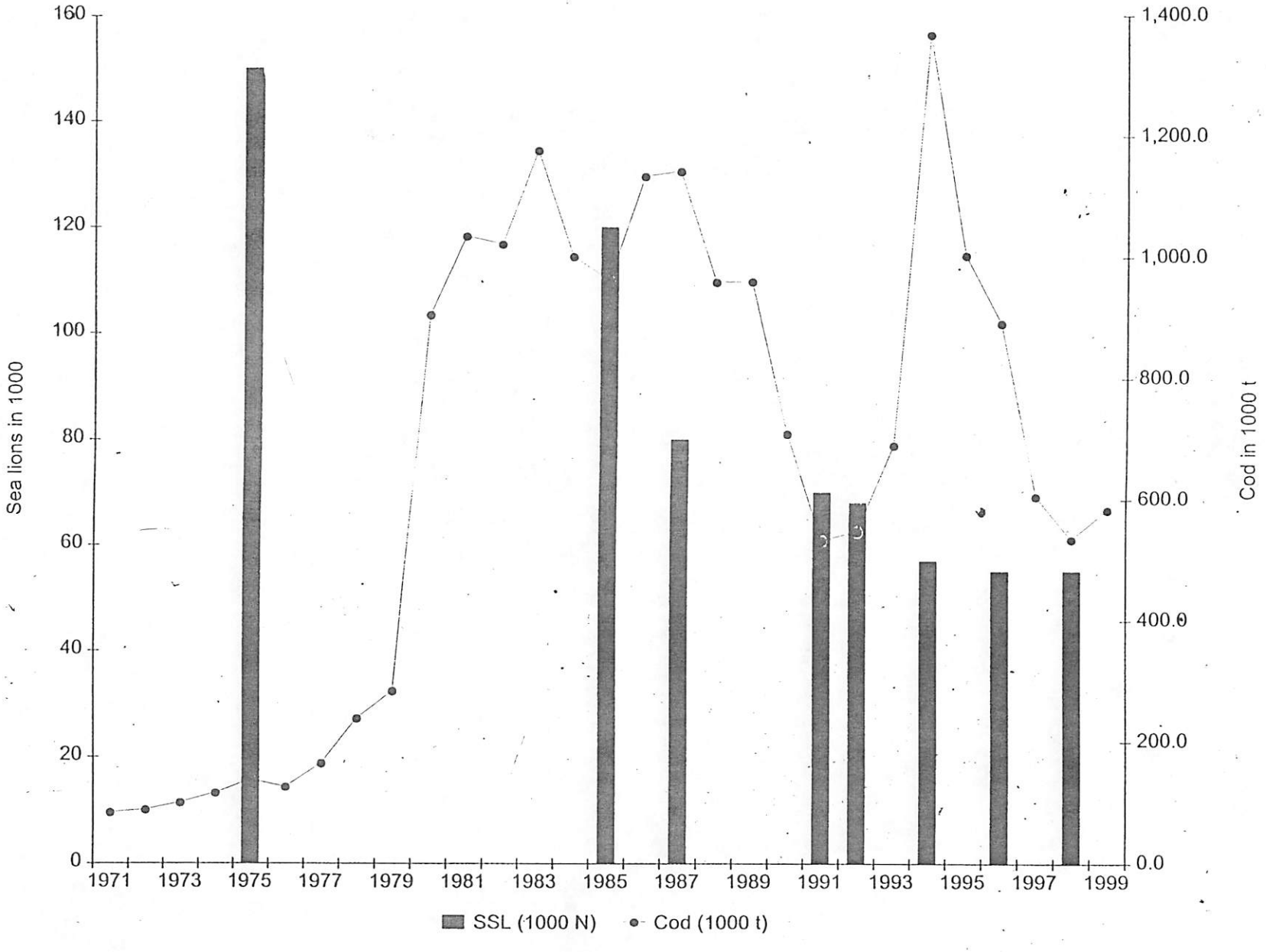
This team includes: Kodiak fisherman Jay Stinson; Michelle Ridgeway of the Alaska Marine Conservation Council; Ken Pitcher of the state Department of Fish and Game; Bob Small and Gordon Kruze, also of Fish and Game; and another fisherman and an independent scientist to be named shortly.

In announcing his response to the Zilly ruling, Knowles noted that the conditions faced by Alaska fishermen every day are some of the most challenging on earth. "According to the National Institute of Occupational Safety and Health, Alaska fishermen face a workplace mortality rate 20 times the national average, and that rate is highest—more than 50 times the national average—among those who fish farthest from shore," Knowles said.

"During my recent visit to Kodiak, I was vividly reminded of the peril faced by fishermen and women by the memorial that records the names of those lost at sea"," Knowles concluded. "I resolved then to take whatever steps are necessary to keep names from being added to that list. The actions I am taking today are intended to do just that: to restore a safe and viable fishery for Alaska small boat fishermen and the communities in which they live."

-30-

JOHN BURNS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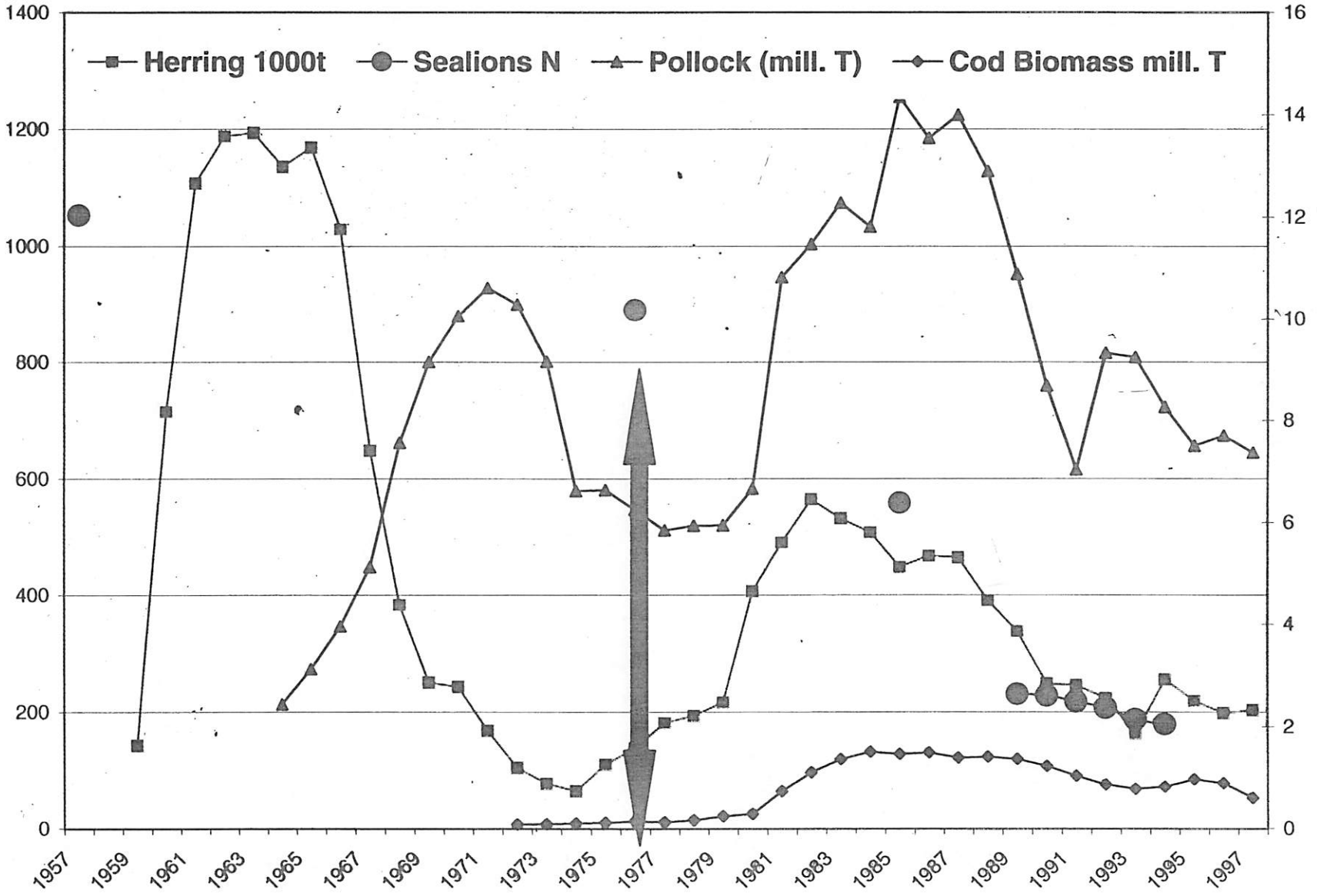
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Separate 55C

Jack Stern/
K. Stump

SPATIAL DISPERSION

Rookeries and Haulouts:

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- Cap fixed gear catches at a conservative percentage (e.g., 10%) of survey cod biomass within the foraging area.

Other Spatial Measures:

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- Distribute Aleutian Islands TAC across management areas 541, 542 and 543
- Distribute Bering Sea TAC in the SCA, east of 170W long. and west of 170W long.

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Bering Sea, Aleutian Islands and Gulf of Alaska Fishing Seasons:

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A.....Jan	25%
B.....Apr	25%
C.....Jun	25%
D.....Sep	25%

Concurrent BS, AI and GOA seasons
Two-week stand-downs
No rollovers

Russell Pritchett
C-2

beyond, the Council recommended no closure for the eight sites exempted under the previous emergency rule, and recommended an additional site, Spitz Island, be exempted. The Council's recommendation included no closures around Cape Barnabas, Gull Point, and Cape Ikolik, and modified trawl exclusion zones around Rugged Island, Point Elrington, The Needles, Mitrofania Island, Spitz Island, and Sea Lion Rocks. NMFS has reviewed these sites in the RFRPAs and determined that they require additional protection, and therefore is implementing an alternative suite of management measures.

Sites around Point Elrington and The Needles meet the criteria for pollock trawl exclusion zones but are not established as exclusion zones under this emergency interim rule. The sites lie entirely within Alaska State waters. Pollock fisheries in these areas are not managed under Federal regulations implementing FMPs. The State of Alaska has indicated its intent to develop equivalent protection measures for these haulouts in 2000. However, if the State fails to develop adequate protection measures for these two sites, NMFS will implement additional protection measures in these areas in 2001 under the authority of the ESA.

This emergency interim rule closes Sea Lion Rocks for a radius of 10 nm to all vessels greater than 60 ft (18.3 m) length overall (LOA). Due to safety concerns for small boats in the region and the relatively lower levels of harvests by these vessels, the area is not closed to vessels less than or equal to 60 ft (18.3 m) LOA. Historically, from 1994 through 1998, vessels longer than 60 ft (18.3 m) LOA have accounted for 72 percent of total harvests in this area. The RFRPAs concluded that excluding vessels greater than 60 ft (18.3 m) LOA from fishing within 10 nm of Sea Lion Rocks, and the subsequent harvest reductions under this closure, would provide sufficient protection against localized depletions of pollock.

Cape Barnabas, Gull Point, Rugged Island, Cape Ikolik, Spitz Island, and Mitrofania Island were proposed by the Council to be included as pollock trawl exclusion zones for 2000 and beyond with a variety of exemptions. However, this emergency rule closes these areas because they have been determined to be critical to the recovery of the western population of Steller sea lions.

In the Bering Sea, the Walrus Island rookery also meets the requirements under the RPA guidelines for closure to 20 nm. However, because this site falls entirely within the Pribilof Island Area Habitat Conservation Zone (see § 679.22(a)(6)), which is closed to trawling year-round, a 20-nm closure of this area would be redundant and is not necessary.

Aleutian Islands Closure

The RFRPA guidelines require that the AI be closed to directed fishing for pollock to protect the waters surrounding rookeries and major haulouts of Steller sea lions. This closure was implemented in 1999, by a reduction in TAC allocated to this subarea that provided for incidental catch only, and then by emergency interim rule. The closure of the AI is continued by this emergency interim rule.

Bering Sea Management Measures

Steller sea lion conservation area (SCA). This emergency interim rule establishes a conservation area to regulate total removals of pollock. This area was previously referred to as the combined Critical Habitat/Catcher Vessel Operation Area in previous emergency rulemaking and in supporting documents. The SCA includes the portion of Bering Sea critical habitat known as the Bogoslof foraging area and the portion of the Catcher Vessel Operational Area (CVOA) that extends eastward from the Bogoslof foraging area. This eastern block of the CVOA overlaps with the pollock trawl exclusion zone for Sea Lion Rocks (Amak Island). Inclusion of this eastern block in the SCA is necessary to provide sufficient protection from concentrated fishing and resulting localized depletions of sea lion prey in (1) the narrow corridor between the Bogoslof foraging area and the Sea Lion Rocks (Amak Island) trawl exclusion zone and (2) these adjacent portions of critical habitat.

The SCA consists of the area of the BS between 170°00′ W long. and 163°00′ W long., south of straight lines connecting the following points in the order listed: 55°00′ N lat. 170°00′ W long.; 55°00′ N lat. 168°00′ W long.; 55°30′ N lat. 168°00′ W long.; 55°30′ N lat. 166°00′ W long.; 56°00′ N lat. 166°00′ W long.; 56°00′ N lat. 163°00′ W long.

This emergency interim rule restricts pollock harvests within the SCA to a percentage of each sector's seasonal directed fishing allowance (DFA) according to the percentages set forth in Table 2 of the preamble. In the Bering Sea, the DFA is the amount of pollock available for harvest by each industry sector after subtracting the incidental catch allowance (ICA).

NMFS will monitor catch by each industry sector and close the SCA to directed fishing for pollock by sector when NMFS determines that the specified SCA limit has been reached. In accordance with the Council's intent, inshore catcher vessels less than or equal to 99 ft (30.2 m) LOA are exempt from SCA closures during the fall and winter months unless the cap for the inshore sector has been reached. Under the authority of the American Fisheries Act (AFA), NMFS will separate the inshore fishery into cooperative and non-cooperative sector allocations. For each sector, NMFS will announce the closure of the SCA to catcher vessels over 99 ft (30.2 m) LOA before the inshore sector SCA limit is reached. NMFS will implement the closure in a manner intended to leave remaining quota within the SCA that is sufficient to support directed fishing for pollock by vessels less than or equal to 99 ft (30.2 m) LOA for the duration of the inshore sector opening. This measure will be implemented during the fall and winter seasons only because of vessel safety concerns during these time periods of severe weather.

Fishing seasons. This emergency interim rule establishes new fishing seasons for the four sectors of the Bering Sea pollock fishery that are defined in the AFA. These new fishing seasons are summarized in Table 1 or the preamble. This emergency rule also repeals existing "fair start" provisions that required vessels fishing for pollock in the BS to cease fishing for groundfish during the week preceding each pollock season or face a mandatory stand-down period during the first week of the pollock season. The Council has determined that these fair start requirements are no longer necessary and has recommended an exclusive seasonal system (see Table 1 in the preamble).

The Council recommended a complex suite of seasons, stand-downs, and SCA limits. Under the RFRPAs, NMFS determined that stand-downs between the A/B and C/D seasons were unnecessary outside the SCA. However, NMFS also determined that the SCA was of special concern and that lengthening the seasons to attain spatial and temporal dispersion was a priority in this area. Therefore, the season dates as proposed by the Council have been altered to reflect these requirements. All sectors now have the same fishing season dates as described in the following Table 1.