

Public Comment Received in the 2017-2018 Meeting Cycle re Kapp's request
Excerpted from Southeast Shellfish & Finfish Public Comments

ADF&G.....	PC003
Alan Otness	PC005
Bill Menish.....	PC014
Darrell and Ryan Kapp	PC039
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Southeast Alaska Fishermen's Alliance.....	PC149



THE STATE
of **ALASKA**
GOVERNOR BILL WALKER



PC003
2 of 8

Department of

ALASKA BOARD OF FISHERIES

1255 West 8th Street
P.O. Box 115526
Juneau, Alaska 99811-5526
Main: 907.465.4110
Fax: 907.465.6094

March 3, 2015

Bruce Twomley
Chairman, Alaska Commercial Fisheries Entry Commission
P.O. Box 110302,
Juneau, AK 99811-0302

Subject: Board of Fisheries Action on Southeast and Yakutat Finfish Meeting Proposal 126

Chairman Twomley:

During the 2015 Southeast and Yakutat Finfish meeting in Sitka this past week, the Board of Fisheries considered Proposal 126, which would allow Sitka Sound herring seine permit holders to utilize open pounds to harvest roe on kelp in lieu of their customary sac-roe herring seine gear.

You may be aware the Sitka Sound herring fishery value has declined somewhat over the past few years with the market price falling below \$200/ton.

Also, the Sitka Tribe has encouraged the Board to reduce open fishing area and diminish harvest levels.

In considering Proposal 126, the Board was intrigued that the open pound fishery might provide a potentially higher price-point product to the market.

The Board was advised by the Department of Law that the Board likely does not have authority to allow new entrants to limited entry herring pound fisheries without approval by the Commercial Fisheries Entry Commission (CFEC).

A majority of the Board voted to again consider Proposal 126 next year if CFEC were to re-define the current administrative area for the Southern Southeast herring pound limited entry fishery to exclude Sitka Sound, where it appears no herring pound operations are currently authorized or have occurred there. The Board could then consider authorization of open pound gear as an alternative for sac roe seine permit holders. The CFEC could then ratify that alternative gear for seine permits.

The Board was offered a variety of options by the Department of Law for action on Proposal 126 in light of the inability of the Board to pass the proposal as written, including passing the proposal contingent on eventual approval by CFEC. Not knowing whether or when CFEC might act, the Board found it difficult to craft appropriate language. The Board decided it was more appropriate for the proposer to approach CFEC for approval of this concept before the Board would take subsequent action and allow current seine permit holders the option of utilizing open pound alternative gear.



Accordingly, I am writing to inform you that the Board is open to further consideration of the proposal, and encourages the CFEC to assess the feasibility of acting to allow this fishery when approached by the proposer, Mr. Ryan Kapp.

You may already be aware of this concept as it has been before both the Board of Fisheries and CFEC over the years. We understand that CFEC may need a fair amount of time to make its determination.

Best Regards,

A handwritten signature in black ink that reads "Tom Kluberton". The signature is written in a cursive style and is followed by a horizontal line.

Tom Kluberton, Chairman
Alaska Board of Fisheries

Attached: Proposal 126

CC: The Honorable Sam Cotten, Commissioner ADF&G



THE STATE
of **ALASKA**
GOVERNOR BILL WALKER

Commercial Fisheries Entry Commission

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May 13, 2015

Tom Kluberton, Chairman
Alaska Board of Fisheries
P.O. Box 115526
Juneau, AK 99811-5526

Re: Board of Fisheries Action on Southeast and Yakutat Finfish
Meeting Proposal 126

Dear Chairman Kluberton:

I am sorry for the time that this response to your March 3, 2015 letter has taken. CFEC and I have had much more than the usual interruptions during the intervening period.

You called our attention to Board Proposal 126, which appears to be intended to authorize open pounding as an alternative means of harvesting roe herring in the Sitka Sound roe herring seine fishery.

An issue arising from the proposal is that CFEC's current definition of the administrative area for the Northern Southeast herring spawn-on-kelp pound fishery includes the area in which the Sitka Sound roe herring purse seine fishery is conducted.

Your letter suggested the following approach:

The Board was advised by the Department of Law that the Board likely does not have authority to allow new entrants to limited entry herring pound fisheries without approval by the Commercial Fisheries Entry Commission (CFEC).

* * *



A majority of the Board voted to again consider Proposal 126 next year if CFEC were to re-define the current administrative area for the [Northern] Southeast herring pound limited entry fishery to exclude Sitka Sound, where it appears no herring pound operations are currently authorized or have occurred there. The Board could then consider authorization of open gear as an alternative for sac roe seine permit holders. The CFEC could then ratify that alternative gear of seine permits.

I dithered over this a little bit, because I am accustomed to the Board first making a methods and means decision conditioned on subsequent independent regulatory action by the commission. However, there is at least a *prima facie* case for CFEC making a regulatory proposal that would modify its current definition of the administrative area for the Northern Southeast herring spawn-on-kelp pound fishery to exclude the area within Board's definition of the Sitka Sound roe herring purse seine fishery. Because our administrative area definition includes another limited fishery subject to Board regulation, there is an argument that we have not fully met our statutory duties under the Limited Entry Act AS 16.43.200, which reads in relevant parts as follow:

The commission shall establish administrative areas suitable for regulating and controlling entry into the commercial fisheries. The commission shall make the administrative area reasonably compatible with the geographic areas for which specific commercial fishing regulations are adopted by the Board of Fisheries.

* * *

The commission may modify or change the boundaries of administrative areas when necessary and consistent with the purposes of [the Limited Entry Act].

We will develop and publish a regulatory proposal for public comment. Of course, we will have to reserve judgment, until we have heard all the public testimony, as to whether the proposal is or is not consistent with the purposes of the Limited Entry Act. I can think of



competing analyses, and I am not sure about where this proposal will end up. But we can ensure that all sides are heard and fairly considered.

By Direction of the
COMMERCIAL FISHERIES ENTRY COMMISSION

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Benjamin Brown, Commissioner
Bruce Twomley, Chairman

cc: The Honorable Sam Cotten
Commissioner, ADF&G



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January 8, 2016

Tom Kluberton, Chair
Alaska Board of Fisheries
P.O. Box 115526
Juneau, AK 99811-5526

Re: Board of Fisheries Action on Southeast and Yakutat Finfish Meeting Proposal 126

Dear Chairman Kluberton:

As I indicated we would in my letter to you of May 13, 2015, the Entry Commission developed and gave public notice of a regulatory proposal to exclude Sitka Sound from the administrative area for the Northern Southeast herring spawn-on-kelp pound fishery [20 AAC 05.230(a)(9)].

In addition to the usual public notice, CFEC sent an individual notice to all permit holders in that fishery, the Southern Southeast herring spawn-on-kelp pound fishery, and the Southeast roe herring seine fishery, inviting them to send written comments or appear at a public hearing on the proposal that was held at the Entry Commission offices in Juneau on November 6, 2015. The public comment period closed on November 13, 2015.

After due consideration, the Commission has decided to take no further action on the proposal, as we believe the record at this point does not support a change in the boundaries of the administrative area for the pound fishery.

When the Entry Commission considered a petition to limit the pound fisheries in Southeast Alaska in 1994, ADF&G Commissioner Carl Rosier sent us a memorandum regarding the Department's management and conservation concerns with the fisheries in the Hoonah Sound and Craig/Klawock areas. The Commissioner made clear the department's preference for either two large administrative areas (Northern and Southern) covering all of Southeast Alaska, or two



smaller administrative areas that would encompass Hoonah Sound and Craig/Klawock. The Entry Commission ultimately chose the first alternative and defined the Northern and Southern administrative areas as suggested in Commissioner Rosier's memorandum.

Nothing in our research or the public comment we received on this latest proposal convinces us that a change is needed at this time in the administrative area definition for the fishery that has been in place since 1995. If, however, the Board of Fisheries decides to go forward with Proposal 126 or something like it, we would reconsider the matter and examine whether allowing the Southeast roe herring seine permit holders to participate as pound fisherman would be consistent with the Limited Entry Act. Without prejudging the issue, I must tell you that, based on the overwhelmingly negative public comment we received, proponents of such a change will have a significant burden of persuasion.

I have copied this letter by email to Glenn Haight and attached copies of all public comment we received (letters and emails), as well as an unofficial transcript of the public hearing we held in Juneau on November 6, 2015. Virtually all of the public comment and testimony concerns Proposal 126 and, with the exception of those of its proponent Mr. Kapp, all comments were in opposition to the adoption of Proposal 126, mostly because of the potential negative economic effects on the existing pound fishery and its permit holders. It is also worth noting that not a single Southeast roe herring purse seine permit holder offered comment or testimony in favor of the proposal.

Please don't hesitate to contact me if you and have any questions regarding this matter.

Yours Truly,
Commercial Fisheries Entry Commission

A handwritten signature in black ink, appearing to read "Bruce Twomley".

Bruce Twomley, Chairman
Benjamin Brown, Commissioner

CC: Permit Holders (G01A, L21A, & L21C)
Sitka Tribe of Alaska
Southeast Alaska Seiners Association



Submitted By
Alan Otness
Submitted On
10/2/2017 10:21:11 AM
Affiliation
Sitka sac roe permit holder

Phone
9077723458
Email
adotness@gmail.com
Address
696 Mitkof hwy box 317
Petersburg, Alaska 998330

Dear Chairman Jensen:

I am writing to give my support for proposal EF-F17-067. There are many good reasons why this proposal , open pound spawn on kelp as an alternative to seining , makes sense.

I was involved with the experiment to test the open pound idea in Sitka and came away from that experience enthusiastic about the possibilities. Let's make this happen.

Sincerely, Alan Otness. Sitka Sac Roe Permit Holder



October 1, 2017

Alaska Board of Fisheries,

My name is Bill Menish and I have been a Sitka Sound sac roe permit holder and participant since before limited entry. I also am a permit holder in the Northern closed pound fishery and participated in that fishery for 8 years until it was shut down for lack of herring. In that fishery, I believe we, as fisherman, are responsible for the demise of the Northern closed pound fishery.

I am in full support of Proposal EF-F-17-06 to allow open pounding in the Sitka sac roe fishery as an alternative to seining. The open pounding has proven to work well in the past experimental fishery in 1998-1999 in Sitka Sound which I was involved in. It is truly a green fishery with no dead loss unlike closed pounding where I have seen a lot of dead loss. You cannot keep stuffing more and more herring into a small enclosure and not have major fatalities.

This proposal gives fisherman a chance to increase the value of he fishery and more herring would swim off, helping the biomass remain strong.

I urge the Board to act on this proposal to help maintain a healthy biomass. Killing less herring and yet increasing the value of the fishery is a very positive thing. Open pounding will achieve this.

Thank you.

Bill Menish



October 2, 2017

To: Board of Fisheries
Alaska Department of Fish and Game
Boards Support Section
PO Box 115526
Juneau, AK 99811-5526

Re: EF-F17-067 Request for Board support for CFEC regulatory change

Dear Board Members,

In April of this year we submitted a proposal to allow existing Sitka Sound Sac Roe Seine permit holders to use open pound roe on kelp as an alternative to seining in the harvest of herring eggs from Sitka Sound. The proposal was similar to what was presented to the Alaska Board of Fisheries (Board) during the last cycle in 2014/15. As some of you may recall there is divergence on whether or not the Board had the statutory authority to act on the proposal. There seems to be a circular argument taking place: The Board cannot act on the proposal until Commercial Fisheries Entry Commission (CFEC) makes changes and CFEC will not make changes until the Board acts on the proposal. Interesting to note: The most recent letter indicates the Board cannot dictate gear used as opposed to the administrative area overlap which was previously believed to be the problem.

In continued dialogue with CFEC we continue to be told that CFEC will not act until the Board acts. This has been stated in virtually every memo and exchange the Board has had with CFEC regarding this situation. Why is the Board's council so staunch in an opinion which differs from CFEC's view? Why is it that folks involved in the same process, reading the same statutes, can't arrive at a similar conclusion?

The proposal in question encourages a change which would result in increased fishery value combined with a reduction in the amount of fishing mortality. To anyone tasked with resource management this is a win/win scenario. This proposal offers more value for less resource removal. Why shouldn't the Board have opportunity to approve or deny such a concept? Isn't this what the Board of Fisheries is for?

We have attached documents supporting our position that the Board should be able to act on our proposal. The proposal was never intended for, or submitted to, CFEC as CFEC has made it clear they wish the Board to present a position to them before they will propose regulation. Contrary to CFEC's opinion there is support from Sitka permit holders however; the support letters were submitted to the Board and not CFEC. We believe the proposal in question is a good idea which will improve a fishery. We believe the decision of whether the proposal is carried or fails should be left up to the Board of Fisheries. Please find a way for this proposal to be heard, debated, and decided by the Board.

Thank you for your time.

Regards,

Darrell and Ryan Kapp



THE STATE
of ALASKA
GOVERNOR BILL WALDEE

Department of Fish and Game

BOARDS SUPPORT SECTION
Headquarters Office

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www.adfg.state.ak.us

August 2, 2017

Mr. Darrell Kapp
338 Bayside Road
Bellingham, Washington 98225

Subject: 2017/2018 Board of Fisheries Proposal Review

Dear Mr. Kapp:

On behalf of the Board of Fisheries (board) and Department of Fish and Game (department), thank you for submitting a proposal for consideration by the board in the 2017/2018 meeting cycle. Proposals accepted for the meeting cycle are in response to the Call for Proposal that was issued by the board in the fall of 2016. The call sought proposals for regulatory change in Title 5 of the Alaska Administrative Code specifically for finfish in the Prince William Sound Area including Upper Copper and Upper Susitna Rivers, finfish and shellfish in the Southeastern Alaska and Yakutat Areas, and Dungeness crab, shrimp, and other miscellaneous shellfish in all other statewide regions.

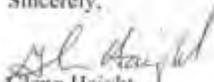
As part of the proposal review, the department looks to see if proposals are related to the regulations cited in the call, within the board's statutory authority to act, clear and understandable, and seeking regulatory change. There are occasions when proposals do not meet this baseline review and are not entered into the meeting cycle proposal book.

The proposal you submitted, EF-F17-067, seeks to create a herring pound fishery in Sitka Sound to allow existing herring sac roe permit holders the option of using either gear, or if board authority does not exist, express support for the concept to the Commercial Fishery Entry Commission (CFEC).

The board does not have the authority to determine which gear will be used by limited entry permit holders. As noted in your proposal that is under the authority of CFEC. The proposal will be added to the board's October 2017 work session work book in the event they care to take up the subject of expressing support to CFEC for this concept. If you would like to provide additional information to the board prior to that meeting, the due date for public comment is October 3, 2017.

Again, thank you for taking a personal interest and direct action in Alaska's fish and game management system.

Sincerely,


Glenn Haight
Executive Director



Ryan Kapp RC100

MEMORANDUM STATE OF ALASKA
COMMERCIAL FISHERIES ENTRY COMMISSION

TO: Alaska Board of Fisheries

DATE: January 12, 2000

Dan K. Coffey, Chairman
Ed Dersham
Larry J. Engel
Grant Miller
Russell Nelson
Virgil L. Umphedour
Dr. John R. White

PHONE: (907) 789-6160 VOICE
(907) 789-6170 FAX



FROM: Commercial Fisheries
Entry Commission

SUBJECT: Board Proposals 168, 175 and 174-
Optional Open Pounding
Alternative for the Southeast Roe
Herring Seine Fishery (Sitka Sound)

Marlene Johnson, Commissioner
Mary McDowell, Commissioner
Bruce Twomley, Chairman

Board Proposals 168 and 175 would authorize open pounding as an alternative means of harvesting roe herring in the Sitka Sound roe herring seine fishery. Board Proposal 174 opposes the change.

The Board previously considered this issue in January of 1997 (Proposal 441). Our comments at the time (coordinated with those of the Department of Law) remain current today. This memo is a recap.

*

Since our 1997 communications, (1) the Department has experienced managing the experimental, Sitka Sound open pound fishery authorized by the Board in 1997; and (2) the Board authorized a herring pound spawn-on-kelp alternative for Norton Sound herring limited entry permit holders (both gillnet and beach seine). 5 AAC 27.965.

If the Board were to act favorably on Proposals 168 and 175, the Board should be very clear its action affects only the existing, limited Sitka Sound roe herring purse seine fishery.

In turn, following favorable Board action on Proposals 168 and 175, CFEC would stand ready to propose complimentary changes to its regulations. To adopt such regulations after a public comment period, CFEC would be required to determine independently that the purposes of the Limited Entry Act would be served by doing so.

In particular, CFEC's current definition of the administrative area for the Northern Southeast herring spawn-on-kelp pound fishery includes the area in which the Sitka Sound roe herring purse seine fishery is conducted. Compare 20 AAC 230(a) and 5 AAC 33.200(m)(2). CFEC would likely propose



modification of its current definition of the administrative area for the Northern Southeast herring spawn-on-kelp pound fishery to exclude the area included within the Board's definition of the Sitka Sound roe herring purse seine fishery.

In making and considering this proposal, CFEC would be guided by the Limited Entry Act, AS 16.43.200, which reads in relevant part as follows:

The commission shall establish administrative areas suitable for regulating and controlling entry into the commercial fisheries. The commission shall make the administrative areas reasonably compatible with the geographic areas for which specific commercial fishing regulations are adopted by the Board of Fisheries.

* * *

The commission may modify or change the boundaries of administrative areas when necessary and consistent with the purposes of [the Limited Entry Act].

Generally, the Entry Commission would also be guided by AS 16.43.950, which, in relevant part, provides:

Nothing in [the Limited Entry Act] limits the powers of the Board of Fisheries, including the power to determine legal types of gear and the power to establish size limitations or other uniform restrictions applying to a certain type of gear. Holders of interim-use permits or entry permits issued under this chapter are subject to all regulations adopted by the Board of Fisheries.

Our regulatory procedure would allow us to meet our responsibility under the Limited Entry Act, and, additionally, help generate public awareness and comment (particularly from members of the public who believe they have interests under the limited entry system that should be addressed). Our procedure creates an opportunity for the commission to clarify potential ambiguity between regulations of the Board and of the commission. The commission must reserve judgment on the issue until it has received public comment.

Bruce Twomley plans to report to the Board on Saturday, January 15, 2000.

If the Board has additional questions during the following Board meetings, at least one of the following individuals will be available by phone at 789-6160: Bruce Twomley, Susan Haymes, or Kurt Schelle.

cc: Frank Rue, Commissioner, ADF&G
Doug Mecum, Director of Commercial Fisheries
Scott Marshall, Regional Supervisor
Diana Cote, Executive Director, Board of Fisheries
Stephen White, Assistant Attorney General



MEMORANDUM

STATE OF ALASKA *Department of Law*

To: Glenn Haight
Executive Director
Alaska Board of Fisheries

Date: February 11, 2015

File No.: JU2014200582

Tel. No.: 269-5232

Fax: 279-2834

From: Lance Nelson
Seth Beausang
Assistant Attorneys General
Natural Resources Section
Department of Law

Subject: **Comments on Proposals for
2015 Board of Fisheries
Meeting on Southeast
Alaska/Yakutat Finfish Issues**

The Department of Law has the following comments on the proposals to be considered by the Board of Fisheries at its 2015 meeting in Sitka on regulations for Southeast Alaska and Yakutat Areas finfish issues.

Proposal 124: This proposal would authorize equal share quotas for participants in the Sitka Sound sac roe herring fishery during years when 70% of permit holders voted in favor of such quotas. This is likely beyond the authority of the board. The board may not delegate its authority to decide how a fishery is prosecuted to anyone other than the commissioner or department, especially when there are expected to be individual fishers who do not favor the quota.

Proposal 126: This proposal would allow herring seiners to opt to use open herring pounds in lieu of their seine gear. Southeast Alaska herring pound limited entry permit holders are generally the only users who can participate in a pound fishery in their administrative area, not seiners. "Herring pound" is generally defined as "an enclosure used primarily to retain herring alive over an extended period of time." 5 AAC 39.105(d)(20). But in Southeast Alaska, a "herring pound" can include an "open pound" which is defined in 5 AAC 27.130(e)(2). The board likely does not have authority to allow additional users into this limited entry fishery without prior action by the Commercial Fisheries Entry Commission (CFEC).

Proposals 131-134: These proposals raise similar issues as in Proposal 126. There are already three permit holders in the Southern Southeast sablefish limited entry pot fishery. 20 AAC 05.320(e). The board likely does not have authority to allow additional users into this limited entry fishery without prior action by the CFEC.

Proposal 148: If the board authorizes community harvest permits, such permits could not be limited to residents of Hoonah or any other particular community.

Proposal 155: This proposal would allow "boat" or "party limits" for sport fishing rather than bag or possession limits that apply to individuals. One consideration



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RC 142
Department of Fish and Game
ALASKA BOARD OF FISHERIES

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March 3, 2015

Bruce Twomley
Chairman, Alaska Commercial Fisheries Entry Commission
P.O. Box 110302,
Juneau, AK 99811-0302

Subject: Board of Fisheries Action on Southeast and Yakutat Finfish Meeting Proposal 126

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You may be aware the Sitka Sound herring fishery value has declined somewhat over the past few years with the market price falling below \$200/ton.

Also, the Sitka Tribe has encouraged the Board to reduce open fishing area and diminish harvest levels.

In considering Proposal 126, the Board was intrigued that the open pound fishery might provide a potentially higher price-point product to the market.

The Board was advised by the Department of Law that the Board likely does not have authority to allow new entrants to limited entry herring pound fisheries without approval by the Commercial Fisheries Entry Commission (CFEC).

A majority of the Board voted to again consider Proposal 126 next year if CFEC were to re-define the current administrative area for the Southern Southeast herring pound limited entry fishery to exclude Sitka Sound, where it appears no herring pound operations are currently authorized or have occurred there. The Board could then consider authorization of open pound gear as an alternative for sac roe seine permit holders. The CFEC could then ratify that alternative gear for seine permits.

The Board was offered a variety of options by the Department of Law for action on Proposal 126 in light of the inability of the Board to pass the proposal as written, including passing the proposal contingent on eventual approval by CFEC. Not knowing whether or when CFEC might act, the Board found it difficult to craft appropriate language. The Board decided it was more appropriate for the proposer to approach CFEC for approval of this concept before the Board would take subsequent action and allow current seine permit holders the option of utilizing open pound alternative gear.



Commissioner Bruce Twomley

- 2 -

March 3, 2015

Accordingly, I am writing to inform you that the Board is open to further consideration of the proposal, and encourages the CFEC to assess the feasibility of acting to allow this fishery when approached by the proposer, Mr. Ryan Kapp.

You may already be aware of this concept as it has been before both the Board of Fisheries and CFEC over the years. We understand that CFEC may need a fair amount of time to make its determination.

Best Regards,

A handwritten signature in black ink that reads "Tom Kluberton".

Tom Kluberton, Chairman
Alaska Board of Fisheries

Attached: Proposal 126

CC: The Honorable Sam Cotten, Commissioner ADF&G



THE STATE
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Commercial Fisheries Entry Commission

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May 13, 2015

Tom Kluberton, Chairman
Alaska Board of Fisheries
P.O. Box 115526
Juneau, AK 99811-5526

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Meeting Proposal 126

Dear Chairman Kluberton:

I am sorry for the time that this response to your March 3, 2015 letter has taken. CFEC and I have had much more than the usual interruptions during the intervening period.

You called our attention to Board Proposal 126, which appears to be intended to authorize open pounding as an alternative means of harvesting roe herring in the Sitka Sound roe herring seine fishery.

An issue arising from the proposal is that CFEC's current definition of the administrative area for the Northern Southeast herring spawn-on-kelp pound fishery includes the area in which the Sitka Sound roe herring purse seine fishery is conducted.

Your letter suggested the following approach:

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+ + +

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competing analyses, and I am not sure about where this proposal will end up. But we can ensure that all sides are heard and fairly considered.

By Direction of the
COMMERCIAL FISHERIES ENTRY COMMISSION



Benjamin Brown, Commissioner
Bruce Twomey, Chairman

cc: The Honorable Sam Cotten
Commissioner, ADF&G



This is a public hearing on CFEC's regulatory proposal to modify CFEC's administrative area definition for the Northern Southeast herring spawn-on-kelp pound fishery.

Now I'd like to introduce fellow staff members sitting here with me. I have my Co-Commissioner (Benjamin Brown). We have our Law Specialist (Doug Rickey) and we have Head of our Research (Craig Farrington). And we are the folks in response to your testimony who are likely to be asking you questions. And so as we go forward if someone has a question if you'd just get my attention I'll acknowledge you for the record and so they know who's speaking.

Also before we begin I really want to extend a thank you to (Randy Lippert), (David Pierce), and (Ty McMichael) for helping make this work. You guys have done a splendid job. And we are also grateful to GCI and particularly (Julie Pierce) who has helped us through this process.

Now before we begin taking testimony I wanted to say just a few words about the procedure and our regulatory proposal to remove Sitka Sound from our administrative area of definition for the Northern Southeast herring spawn-on-kelp pound fishery. I mean, as you know, earlier board proposal 126 asked the Board of Fisheries to authorize open ponding as an alternative means for the Sitka Sound roe herring fishery.

Now proposal 126 is not at issue in this proceeding but it certainly was the catalyst for this proceeding and our proposal - the trigger that led to this hearing. And you'll notice that CFEC's proposal in front of you says nothing about proposal 126. Our proposal addresses only our area definition. And I wanted to tell you that we made this proposal for two reasons. And the first is that we were asked to do so by the Board of Fish and by the Department of



CFEC SITKA SOUND

Madera



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Confirmation # 21784507
Page 3

Law. And that's unusual but that request had a certain amount of force. We like to be good colleagues and cooperate where we can. But there's a second reason and that's actually what prepared us forward to make this proposal.

We took a look at our statutory authorization to define administrative areas at our statute with is AS 16 - Alaska Statute 16.43.200 says that the Commission shall make the administrative area reasonably compatible with the geographic areas for which specific commercial fishing regulations are adopted by the Board of Fisheries. And it further says that the Commission may modify or change the boundaries of administrative areas when necessary and consistent with the purposes of the Limited Entry Act.

So, I mean, for us the question that was raised was why did we define the area for Northern (rolunt) kelp to include Sitka Sound in the first place. And we went back to our records, asked our staff to search through what we had, and we could not find a stated reason for doing that. And of course the managers of Sitka Sound have never told us that they wanted to invite more participants in that fishery. It seems that there are plenty of demands there now.

And so we had to acknowledge that our current definition of Northern spawn-on-kelp may not have fully complied with our statute. We just didn't have a stated reason for having included Sitka Sound in that definition. And so we made this proposal and maybe you folks through your testimony can provide us with a sound reason for maintaining the definition or maybe not. It will - much of that will turn on your testimony.

But the thing that I would like all of you to note is that our proposal does not address the merits of proposal 126. And please note that however - whichever way CFEC decides on our proposal the Board of Fisheries could still take up proposal 126. And if the Board were to act favorably on proposal 126 then



CFEC would have to review the Board's action for consideration of whether the Board's action was consistent with the purposes of the Limited Entry Act under Alaska Statute 16.43.4112. And the basic purposes for a Limited Entry that we'd have to have in mind are that Limited Entry is intended to serve conservation and prevent economic distress among fishermen and those depended upon them for a livelihood. That's the most basic standard we work with.

And another thing to keep in mind is that the Board has means and methods authority under Alaska Statute 16.05.251. In turn, the Limited Entry Act governing us Alaska Statute 16.43.950 declares -- and I'm paraphrasing -- nothing in the Limited Entry Act limits the powers of the Board of Fisheries including the power to determine the legal types of gear.

So the short of this proceeding is if the Board in the future acts favorably on Proposal 126 the Board's action will need to come back to CFEC and CFEC will have to determine whether the Board's action is consistent with the purposes of the Limited Entry Act to give it effect.

And so that's when CFEC will be called upon to address the merits. If this does come back to us of course you will all get notice -- anyone interested will get notice -- and have an opportunity to address the merits as well.

So I think we're ready to move forward with your testimony. And if you have questions I'd like you to raise the questions while you are testifying. And we're going to start first with a testimony of people who have traveled here and who are here in this room to testify to us. When we get through your testimony then we'll turn to the people who are lined up on the phone to give their testimony.



THE STATE
of ALASKA
GOVERNOR BILL WALDEE



PC 16
1 of 79

Commercial Fisheries Entry Commission

6400 Commercial Highway, Suite 109
P.O. Box 110302
Juneau, Alaska 99811-0302
Phone: 907, 786,6180
Fax: 907, 786,6180

January 8, 2016

Tom Kluberton, Chair
Alaska Board of Fisheries
P.O. Box 115526
Juneau, AK 99811-5526

Re: Board of Fisheries Action on Southeast and Yakutat Finfish Meeting Proposal 126

Dear Chairman Kluberton:

As indicated we would in my letter to you of May 13, 2015, the Entry Commission developed and gave public notice of a regulatory proposal to exclude Sitka Sound from the administrative area for the Northern Southeast herring spawn-on-kelp pound fishery [20 AAC 05.230(a)(9)].

In addition to the usual public notice, CFEC sent an individual notice to all permit holders in that fishery, the Southern Southeast herring spawn-on-kelp pound fishery, and the Southeast roe herring seine fishery, inviting them to send written comments or appear at a public hearing on the proposal that was held at the Entry Commission offices in Juneau on November 6, 2015. The public comment period closed on November 13, 2015.

After due consideration, the Commission has decided to take no further action on the proposal, as we believe the record at this point does not support a change in the boundaries of the administrative area for the pound fishery.

When the Entry Commission considered a petition to limit the pound fisheries in Southeast Alaska in 1994, ADF&G Commissioner Carl Rosier sent us a memorandum regarding the Department's management and conservation concerns with the fisheries in the Hoonah Sound and Craig/Klawock areas. The Commissioner made clear the department's preference for either two large administrative areas (Northern and Southern) covering all of Southeast Alaska, or two



smaller administrative areas that would encompass Hoonah Sound and Craig/Klawock. The Entry Commission ultimately chose the first alternative and defined the Northern and Southern administrative areas as suggested in Commissioner Rosier's memorandum.

Nothing in our research or the public comment we received on this latest proposal convinces us that a change is needed at this time in the administrative area definition for the fishery that has been in place since 1995. If, however, the Board of Fisheries decides to go forward with Proposal 126 or something like it, we would reconsider the matter and examine whether allowing the Southeast roe herring seine permit holders to participate as pound fisherman would be consistent with the Limited Entry Act. Without prejudging the issue, I must tell you that, based on the overwhelmingly negative public comment we received, proponents of such a change will have a significant burden of persuasion.

I have copied this letter by email to Glenn Haight and attached copies of all public comment we received (letters and emails), as well as an unofficial transcript of the public hearing we held in Juneau on November 6, 2015. Virtually all of the public comment and testimony concerns Proposal 126 and, with the exception of those of its proponent Mr. Kapp, all comments were in opposition to the adoption of Proposal 126, mostly because of the potential negative economic effects on the existing pound fishery and its permit holders. It is also worth noting that not a single Southeast roe herring purse seine permit holder offered comment or testimony in favor of the proposal.

Please don't hesitate to contact me if you and have any questions regarding this matter.

Yours Truly,
Commercial Fisheries Entry Commission

Bruce Twomley, Chairman
Benjamin Brown, Commissioner

CC: Permit Holders (G01A, L21A, & L21C)
Sitka Tribe of Alaska
Southeast Alaska Seiners Association



MEMORANDUM

State of Alaska

Department of Law

TO: Glenn Haight
Executive Director
Alaska Board of Fisheries

DATE: March 4, 2016

FROM: Seth M. Beausang *SMB*
Assistant Attorney General

FILE NO.: JU2015200517

TEL. NO.: 269-5289

SUBJECT: Department of Law
comments on proposals
for the March 8-11, 2016
Statewide Finfish and
Supplemental Issues
meeting

The Department of Law has the following comments on the proposals to be considered by the Board of Fisheries at its March 8-11, 2016 Statewide Finfish and Supplemental Issues meeting:

Proposal 126: As we explained to the board last cycle, this proposal would allow Southeastern Alaska herring purse seine permit holders in Sitka to use open herring pounds in Sitka Sound in lieu of their seine gear. The Northern Southeast herring pound fishery is a limited entry fishery and includes Sitka Sound within the limited entry administrative area. In Southeastern Alaska, a "herring pound" can include an "open pound," which is defined in 5 AAC 27.130(e)(2). The board does not have authority to allow new entrants into the Northern Southeast herring pound limited entry fishery by allowing non-permit holders to use open pounds in the fishery. We understand from PC 16 that CFEC considered changing the administrative area of this limited entry fishery, in order to allow the board to act on this proposal, but that CFEC ultimately declined to change the administrative area. The board does not have the authority to adopt this proposal.

Proposal 194: Based on the statements in the proposal about the alleged impacts of trawl fishing on subsistence uses in this area, the board is encouraged to consider



		FISH AND GAME	SUPPORT	GENERAL COMMENT	OPPOSITION
126-2014-2015	Establish a commercial open pound herring spawn on kelp fishery in Sitka Sound. (Tabled at 2015 Southeast Finfish meeting for consideration at this meeting.)	N	<ul style="list-style-type: none"> • Edna Bay AC 25 • Alan Otness PC 5 • William R. Menish PC 9 • Ryan Kapp PC 14 • Gary Soydam PC 22 • Joe Lindholm PC 25 • Darrell Kapp PC 42 • Steve Feenstra PC 45 • Terry Kilbreath PC 49 	<ul style="list-style-type: none"> • CFEC PC 16 	<ul style="list-style-type: none"> • Sitka AC 17 • Wrangell AC 20 • Sitka Tribe of Alaska PC 2 • Clyde Curry PC 17/18 • Clyde Curry PC 18 • Don Johnson PC 19 • Joel Randrup PC 29 • Larry Demmert PC 30 • Southeast Alaska Fishermen Alliance PC 44 • United Southeast Alaska Gillnetters PC 52
<i>Identification of Gear (2 proposals) (This set of proposals was also heard at the Bristol Bay Finfish meeting where public testimony was taken.)</i>					
27	Require that a CFEC permit holder's name displayed on a set gillnet site marking sign complies with the same character size marking requirements for permit numbers.	N	<ul style="list-style-type: none"> • Cooper Landing AC 11 		<ul style="list-style-type: none"> • Central Peninsula AC 6
28	Change the character size requirements for set gillnet marking signs.	N			<ul style="list-style-type: none"> • Central Peninsula AC 6
<i>Salmon (1 proposal)</i>					



Alaska Department of Fish and Game
Boards Support Section
P.O. Box 115526, Juneau, AK 99811-5526

Re; Support for writing letter to CFEC to Change the Boundaries taking out the Sitka Roe herring Seine area from the Northern Southeast herring spawn on kelp area

Dear Chairman Jensen and Board of Fisheries Members,

Our Problem.

1. Board of Fisheries writes letter to CFEC requesting CFEC to exclude Sitka Sound from the administrative area from the Northern Southeast herring spawn on kelp area.
2. CFEC has a hearing Nov. 6, 2015.
3. CFEC writes back to the Board" After due consideration, the Commission has decided to take no further action on the proposal as we believe the record at this point does not support a change in the boundaries of the administrative area for the pound fishery."

What Happened?

At the CFEC hearing, CFEC asked that the hearing not be about Proposal 126,¹ Allowing Sitka seiners the choice to do open pounding spawn on kelp instead of seining herring. We knew proposal 126 was not suppose to be the issue. We did not send the CFEC any information on the proposal nor did we feel and pressure to fight for our proposal because CFEC was not going to consider it in determining the area change. Testimony proceeded and as Mr. Twomley explains in his letter of January 8, 2016 to the Board of Fisheries "Virtually all of the public comment and testimony concerns Proposal 126 and, with the exception of those of its proponent Mr. Kapp, all comments were in opposition to adoption of Proposal 126, mostly because of the potential negative economic effects on the existing pound fishery and its permit holders."²

We believe the CFEC should have acted as Mr. Twomley states "We took a look at our statutory authorization to define administrative areas at our statute with is AS 16 – Alaska Statute 16.43.200 says that the Commission shall make the administrative area reasonably compatible with the geographic areas for which specific commercial fishing regulations are adopted by the Board of Fisheries."³

We believe the CFEC overlapping the areas was arbitrary and caprices. Mr. Twomley states "And we went back to our records, asked our staff to search through what we had, and we could not find a stated reason for doing that."⁴ Commissioner Carl Rosier memorandum "The Commissioner made clear the department's preference for either two large administrative areas (Northern and Southern) covering all

¹ This fact is in the transcript of the CFEC Sitka Sound hearing Bruce Twomley: page 2, "Now proposal 126 is not at issue", page 3 "But the thing that I would like all of you to note is that our proposal does not address the merits of proposal 126"

² Twomley letter to Board of Fisheries, January 8, 2016

³ CFEC Sitka Sound hearing Bruce Twomley: page 3

⁴ CFEC Sitka Sound hearing Bruce Twomley: page 3, p3



of Southeast Alaska, or two smaller administrative areas that would encompass Hoonah Sound and Craig/Klawock”⁵ The CFEC chose the larger area.

We thought the CFEC hearing would be about the area definitions and why the overlap. Questions should have been:

1. Sitka roe herring fishery was the first limited fishery. The Northern Southeast herring spawn on kelp fishery was later. Was it right to overlap the areas? Mr. Twomley states “And so we had to acknowledge that our current definition of Northern spawn-on-kelp may not have fully complied with our statute.”⁶
2. Do the areas defined represent the actual fisheries going on?
3. Does the Sitka herring roe seine permittee have the right to harvest the roe herring eggs?
4. Does the permit holder have a right to harvest the fish or does the gear?
5. Who has the right to the biomass, the permit holder that fishes the biomass or the gear holder in another area?

The Board needs to go forward with our proposal allowing the Sitka Seine permit holder the opportunity to harvest their share of the herring resource with open pounds instead of purse seine. Indeed the CFEC states “If however, the Board of Fisheries decides to go forward with Proposal 126 or something like it, we would reconsider the matter and examine whether allowing the Southeast roe herring seine permit holders to participate as pound fishermen would be consistent with the Limited Entry Act.”⁷ We are not asking the Board of Fisheries to allow more effort into the Sitka roe herring fishery. We are asking the Board to allow those already in the fishery to use a different method to harvest their share of the resource. Please write the CFEC a letter requesting the CFEC to separate the Sitka Roe Herring area from the Northern Southeast herring spawn on kelp area.

Best regards,

Darrell Kapp

⁵ Twomley letter to Board of Fisheries, January 8,2016

⁶ CFEC Sitka Sound hearing Bruce Twomley: page 3, p4

⁷ Twomley letter to Board of Fisheries, January 8,2016



THE STATE
of **ALASKA**
GOVERNOR BILL WALKER

Commercial Fisheries Entry Commission

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Juneau, Alaska 99811-0302
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January 8, 2016

Tom Kluberton, Chair
Alaska Board of Fisheries
P.O. Box 115526
Juneau, AK 99811-5526

Re: Board of Fisheries Action on Southeast and Yakutat Finfish Meeting Proposal 126

Dear Chairman Kluberton:

As I indicated we would in my letter to you of May 13, 2015, the Entry Commission developed and gave public notice of a regulatory proposal to exclude Sitka Sound from the administrative area for the Northern Southeast herring spawn-on-kelp pound fishery [20 AAC 05.230(a)(9)].

In addition to the usual public notice, CFEC sent an individual notice to all permit holders in that fishery, the Southern Southeast herring spawn-on-kelp pound fishery, and the Southeast roe herring seine fishery, inviting them to send written comments or appear at a public hearing on the proposal that was held at the Entry Commission offices in Juneau on November 6, 2015. The public comment period closed on November 13, 2015.

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Please don't hesitate to contact me if you and have any questions regarding this matter.

Yours Truly,
Commercial Fisheries Entry Commission



Bruce Twomley, Chairman
Benjamin Brown, Commissioner

CC: Permit Holders (G01A, L21A, & L21C)
Sitka Tribe of Alaska
Southeast Alaska Seiners Association



CFEC SITKA SOUND PURPOSED REG.

**Moderator: Bruce Twomley
November 6, 2015
7:51 pm CT**

Operator: Ladies and gentlemen thank you for standing by. Welcome to the CFEC Sitka Sound Purposed Reg conference call.

During the presentation all participants will be in listen-only mode. Afterwards we will conduct a question and answer session. At that time if you have a question please press the 1 followed by the 4 on your telephone. If at any time during the conference you need to reach an operator please press star 0. As a reminder this conference is being recorded Friday November 6, 2015.

I would now like to turn the conference over to Bruce Twomley. Please go ahead sir.

Bruce Twomley: Thank you operator (Kalimer). This is Bruce Twomley and I'm the Chairman of the Commercial Fisheries Entry Commission. We are in the conference room of the Commission's offices in Juneau. As you noted it's Friday, November 6, 2015 and the time is 3:00 p.m.



This is a public hearing on CFEC's regulatory proposal to modify CFEC's administrative area definition for the Northern Southeast herring spawn-on-kelp pound fishery.

Now I'd like to introduce fellow staff members sitting here with me. I have my Co-Commissioner (Benjamin Brown). We have our Law Specialist (Doug Rickey) and we have Head of our Research (Craig Farrington). And we are the folks in response to your testimony who are likely to be asking you questions. And so as we go forward if someone has a question if you'd just get my attention I'll acknowledge you for the record and so they know who's speaking.

Also before we begin I really want to extend a thank you to (Randy Lippert), (David Pierce), and (Ty McMichael) for helping make this work. You guys have done a splendid job. And we are also grateful to GCI and particularly (Julie Pierce) who has helped us through this process.

Now before we begin taking testimony I wanted to say just a few words about the procedure and our regulatory proposal to remove Sitka Sound from our administrative area of definition for the Northern Southeast herring spawn-on-kelp pound fishery. I mean, as you know, earlier board proposal 126 asked the Board of Fisheries to authorize open pounding as an alternative means for the Sitka Sound roe herring fishery.

Now proposal 126 is not at issue in this proceeding but it certainly was the catalyst for this proceeding and our proposal - the trigger that led to this hearing. And you'll notice that CFEC's proposal in front of you says nothing about proposal 126. Our proposal addresses only our area definition. And I wanted to tell you that we made this proposal for two reasons. And the first is that we were asked to do so by the Board of Fish and by the Department of



Law. And that's unusual but that request had a certain amount of force. We like to be good colleagues and cooperate where we can. But there's a second reason and that's actually what prepared us forward to make this proposal.

We took a look at our statutory authorization to define administrative areas at our statute with is AS 16 - Alaska Statute 16.43.200 says that the Commission shall make the administrative area reasonably compatible with the geographic areas for which specific commercial fishing regulations are adopted by the Board of Fisheries. And it further says that the Commission may modify or change the boundaries of administrative areas when necessary and consistent with the purposes of the Limited Entry Act.

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And so we had to acknowledge that our current definition of Northern spawn-on-kelp may not have fully complied with our statute. We just didn't have a stated reason for having included Sitka Sound in that definition. And so we made this proposal and maybe you folks through your testimony can provide us with a sound reason for maintaining the definition or maybe not. It will - much of that will turn on your testimony.

But the thing that I would like all of you to note is that our proposal does not address the merits of proposal 126. And please note that however - whichever way CFEC decides on our proposal the Board of Fisheries could still take up proposal 126. And if the Board were to act favorably on proposal 126 then



CFEC would have to review the Board's action for consideration of whether the Board's action was consistent with the purposes of the Limited Entry Act under Alaska Statute 16.43.4112. And the basic purposes for a Limited Entry that we'd have to have in mind are that Limited Entry is intended to serve conservation and prevent economic distress among fishermen and those depended upon them for a livelihood. That's the most basic standard we work with.

And another thing to keep in mind is that the Board has means and methods authority under Alaska Statute 16.05.251. In turn, the Limited Entry Act governing us Alaska Statute 16.43.950 declares -- and I'm paraphrasing -- nothing in the Limited Entry Act limits the powers of the Board of Fisheries including the power to determine the legal types of gear.

So the short of this proceeding is if the Board in the future acts favorably on Proposal 126 the Board's action will need to come back to CFEC and CFEC will have to determine whether the Board's action is consistent with the purposes of the Limited Entry Act to give it effect.

And so that's when CFEC will be called upon to address the merits. If this does come back to us of course you will all get notice -- anyone interested will get notice -- and have an opportunity to address the merits as well.

So I think we're ready to move forward with your testimony. And if you have questions I'd like you to raise the questions while you are testifying. And we're going to start first with a testimony of people who have traveled here and who are here in this room to testify to us. When we get through your testimony then we'll turn to the people who are lined up on the phone to give their testimony.



Alaska Department of Fish and Game
Boards Support Section
P.O. Box 115526, Juneau, AK 99811-5526

Re; Support for Proposal 112, Management of the Herring Row on Kelp Fishery in SE Alaska

Dear Chairman Jensen and Board of Fisheries Members,

Harvest from the resource based on kelp blades is not accurate and allows overharvest. It's a guess at best.

Kelp blades come in all sizes and shapes. Herring lay their eggs in different densities when spawning. Thus the measurement of extraction from the resource is not measurable using the number of kelp blades. The weight of herring spawn on kelp is a measurable metric.

The Alaska Department of Fish and Game did a study in Sitka and determined the percentage of harvest based on weight that represents the extraction from the herring biomass. This study was based upon the open pound experimental fishery conducted in 1998 & 1999. The regulations should now use weight, in the open pound fishery, as the determining factor for herring spawn on kelp harvest, not the number of blades.

Alaska had herring pound fisheries in many areas. All the areas were using the method of closed pounding. Today the biomass in all those areas, except one, is not sufficient to support a fishery. Only in Craig/Klawock is the fishery still going and the Department has tried to limit the pounds to 20, in 2017, because of the lack of the herring resource. Closed pounding is not the way to harvest herring spawn on kelp. Until a determination can be made of what the extraction from the resource is in the closed pound fishery, based upon weight, that method should be stopped.

Best Regards,
Darrell Kapp



From: Joe Lindholm
To: spawn on kelp--SE ALASKA
Subject: Friday, September 29, 2017 9:44:50 AM
Date:

I am in favor of an alternate style of fishery for the SE roe herring fishery. The existing permit holders would have the option of either participating in the existing herring for roe fishery, or convert to the proposed spawn on kelp fishery.

The pluses to this are: A) The fishers that elected to stay in the herring fishery would have a much better chance to "make" a season because the fleet would be smaller

B) The fishers that elected to pursue the roe on kelp fishery would not hurt the existing fishery in any way because there would be no killing of fish...

C) The permit would generate more revenue to the state (thru higher grosses) and permit values would go up

D) Additional employment would be enjoyed (most likely by the community of Sitka)

The minuses are: There is some belief that this fishery would dilute the existing roe on kelp market. The open pond method of harvesting kelp produces a much thinner product, therefore the product is not the same.

Arguments there will be, but substantiation of this is available. It can be likened to frozen salmon versus canned salmon - both salmon but different markets.



Alaska Department of Fish and Game
Board of Fisheries Support Section
Glenn Height, Executive Director

RE: Miscellaneous Business Sitka Open Pound Information Documents

December 27, 2017

Thank you for continuing the discussion of Open Pound Herring Roe on Kelp being used as an alternative harvest method for existing Sitka Sound seine permit holders. Most of you should know the history of this concept and the unique situation this proposal finds itself in today. The following information was submitted for the last Board cycle (then known as Proposal 126) for the benefit of new Board members and as a refresher for those already familiar with the concept.

Unfortunately this concept is not on your agenda as a proposal due to the Department of Law determination that the Board is not able to make a decision on it until action by Commercial Fisheries Entry Commission (CFEC). CFEC, and their legal counsel, have stated the Board should act on the proposal first. CFEC will not take up this issue again without a clear showing that this concept and proposal is something the Board would actually approve. This puts things in a difficult spot. As stated and submitted to the Board in past documents, according to ours and others understanding of the statutes involved the Board should be able to decide on methods and means in a fishery and then CFEC would decide if the decision violated the purpose of the Limited Entry Act.

This concept and proposal, as you should see or have seen, presents a way to increase the value of the Sitka herring resource and reduce the amount of herring being extracted. This concept and proposal is, for all practical purposes, how resources should be managed: Acquiring more value with less harm to the resource. Unfortunately, again the Board does not have the ability to vote on it. The only option apparently is for the Board to craft another letter to CFEC to, once again, ask them to adjust the administrative area lines so the Board can make a formal vote on the proposal. It seems we are going around in a circle as this request has already been made and CFEC chose no action. This proposal was not supposed to be decided by CFEC. This proposal was supposed to be decided by the Board. If later we find it violates the Limited Entry Act then so be it but at least the process would have gotten to that point rather than having a great idea swept aside as a result of a difference of legal opinion over State statutes. The Board should be allowed to vote on this proposal.

Open pound spawn on kelp (SOK) in Sitka Sound was first proposed to the Board in 1996. In 1998 and 1999 an experimental SOK fishery was conducted in Sitka Sound. Two decades have passed since the experimental fishery but the data, studies, and reports produced are still relevant. The market for herring roe products has not changed much from the time these documents were produced. A finite market for existing herring roe products still remains but expansion is possible with the addition of the thinner product that would be produced with SOK. Currently, issues regarding resource conservation and subsistence needs have come to the forefront and the economies of the fishery have been in decline. Diversifying the fishery with SOK as an alternative harvest method would address many of the concerns surrounding the fishery while improving the overall value of the fishery.



This PC contains the following documents:

- Spawn on Kelp and the Sitka Sound Herring Fishery.
- ADFG Report to the Board re: 1998-99 Experimental spawn on kelp fishery in Sitka Sound.
- Assessment of Macrocystis Biomass, Quality, and Harvesting Effects in Relation to Herring Roe on Kelp Fisheries in Alaska.
- Open Pounds and the Traditional Subsistence Fishery.
- An Update of Market Variables Affecting Demand in Japan.
- ROK Marketing Questions and Answers.
- Letter from Elderwood Trading regarding SOK in Sitka Sound.

The markets for Sitka Sound SOK are not the markets for thick SOK, but for a thinner product at a lower price point with a perceived value which can be more easily consumed in the marketplace. The existing market for SOK is hampered by large fluctuations in volume which have limited market expansion. SOK production in Sitka Sound would ease fluctuations in overall supply giving distributors the opportunity to expand the market, generate more awareness of the product, and increase demand for the product. Increased demand leads to higher prices. This will not happen overnight but it is time for a departure from status quo. SOK in Sitka Sound is a step in the right direction.

Respectfully Submitted,

Ryan Kapp



Spawn On Kelp and the Sitka Sound Herring Fishery

Allowing an Open Pound Spawn on Kelp (SOK) fishery in Sitka Sound will increase the overall value of the fishery while killing less fish than the existing harvest method.

The biology of spawning herring is a big factor in producing more value from the same biomass.

Currently, herring harvest can begin when roe recovery is sampled at 10% roe weight. Put simply: 100 tons of fish equals 10 tons of eggs. In some Sitka Sound openings roe recovery has been as high as 13%. In an experimental SOK fishery conducted in Sitka Sound in 1998 and 1999, Alaska Department of Fish and Game determined that 100 tons of herring biomass harvested with SOK converts into 27 tons of product. This represents a recovery of 27% which more than doubles the existing fishery recovery.

The reason for this increase in weight is biological. Upon fertilization the herring egg hydrates with water increasing the weight of the egg. SOK eggs are spawned, fertilized eggs that are hydrated while seine caught sac roe are pre spawn eggs and not hydrated. Because of this hydration the weight of an individual egg produced with SOK is more than twice as heavy as an individual sac roe egg.

With SOK the value of the eggs is increased as well. For example: 100 tons of herring at current prices (optimistically figure \$200 per ton) is worth \$20,000. That same 100 tons of herring harvested with SOK equates to 27 tons of product or, for simple math, a little over 50,000lbs. 50,000lbs of product sold at current prices (realistically figure \$5 per pound) is worth \$250,000. In this scenario the SOK product is worth more than 12 times the value of the traditional sac roe product.

While harvesting with SOK increases the value of the fishery product the best part is with Open Pound SOK no herring are killed. An Open Pound SOK fishery means the herring can swim into and out of the kelp as they please. There are no nets used at any time. The fish swim in, spawn, and return to sea making them available to spawn again in the future.

Increasing the value of the resource while causing the resource less harm is a win / win scenario. Incorporating Open Pound SOK into the Sitka Herring fishery would be a benefit both now and well into the future.



**Sitka Sound Herring Spawn on Kelp
Open Harvest Platform
Experimental Fishery Report
Spring 1998**



Submitted to
Alaska Department of Fish and Game
Commercial Fisheries Division
ADF&G Contract No. 11-122-98

Submitted by
Paul Gronholdt and Associates
P.O. Box 288
Sand Point, Alaska 99661

Prepared by
Oceanus Alaska
119 Seward Street, Suite 9
Juneau, Alaska 99801



Sitka Sound Roe on Kelp Experimental Fishery Report
Paul Gronholdt and Associates March 1998

EXECUTIVE SUMMARY

In response to a call for change in the Sitka Sound herring fishery, the Board of Fisheries prompted the Alaska Department of Fish and Game to conduct an experimental fishery using the Open Harvest Platform roe on kelp gear alternative. The goals of exploring diversification of the fishery were to improve conservation and encourage greater economic yield to participants.

Paul Gronholdt and Associates carried out the Experimental Fishery in accordance with contract specifications outlined by the Alaska Department of Fish and Game. The team's experience, good weather and an excellent herring return contributed to PGA's attainment of the goals of the experimental fishery.

The PGA team worked in concert with ADF&G research staff to support sampling efforts and generally track the fishery. PGA maintained communications with ADF&G staff from March 15 through the consummation of final product sales in Japan in the late summer.

This report provides a narrative describing procedures and schedules involved in the execution of the experimental fishery. Additional documentation on the harvest details is provided as attachments to this report.

MACROCYSTIS KELP HARVEST

About five tons of *Macrocystis* fronds were harvested from a single kelp bed along the north shore of Heceta Island, Sea Otter Sound. ADF&G reports that this included an estimated 4,080 fronds, each bearing an average of 16 blades. Thus, an estimated 65,280 total blades were "fished" as spawning substrate.

OPEN HARVEST PLATFORM FISHING

About 47 fishermen, consultants and processing crew were directly involved in the fishery. Four platforms were fished in Sitka Sound for two to four days each. Excellent spawn coverage was achieved. They carried out kelp gathering, rack loading, fishing and harvesting from March 16 through the 25th. Processing continued for an additional 2-1/2 weeks.

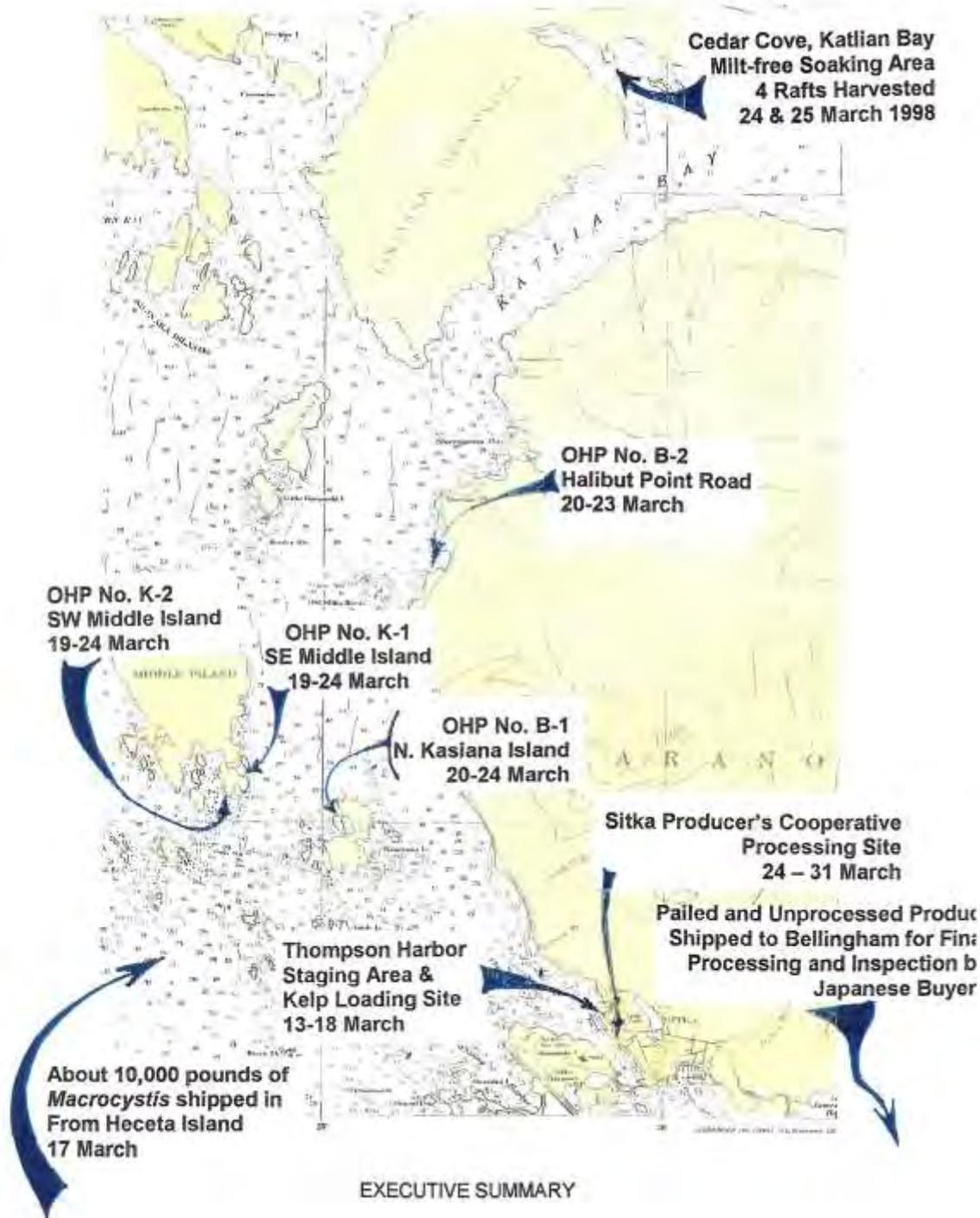
HERRING UTILIZATION

An estimated 104 tons of herring provided spawn for the final product harvested in the experimental fishery. 6,900 tons of herring were taken in the traditional sac roe fishery.

PROCESSING AND MARKETING

The total yield of this effort was 57,038 pounds of "Kazunoko kombu", which sold for 261,538 USD. 74% of the product was graded as #1 or #2, and the average price was \$5.46 per pound. Grade 5 fetched \$0.45 per pound, and Grade 1 paid \$7.58 per pound.

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Open Harvest Platform Method
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**Sitka Sound Herring Spawn on Kelp
Open Harvest Platform Method
Report on Experimental Fishery Results
1998 Season**

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- A. Board of Fisheries Proposal Number 441
- B. Sitka Spawn on Kelp Test Fishery Team Members (PGA) and Contractors
- C. PGA Kelp Harvesting Permit and Kelp Harvest Logs
- D. Detailed Chronology of Test Fishery (Field Records)
- E. March 1998 Interim report: individual rack logistics
- F. Sitka Producers Cooperative Tote Record and ADF&G Fish Tickets
- G. Roe on Kelp Production Report, Kanaway Seafoods
- H. Sitka Tribe of Alaska letter to the Board of Fisheries
- I. ACR 16, submitted to the BOF by Alan Ottness 25 September 1998



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Section 1. Introduction and Background

This report describes the methods used by Paul Gronholdt and Associates in conducting the Sitka Sound Herring Spawn on Kelp Experimental Fishery. The results of the 1998 fishery and some of the challenges encountered in adapting the Open Harvest Platform fishery technique and marketing strategy to Sitka Sound are discussed.

Background

The Sitka Sound herring fishery has allowed only sac roe seine gear since entry to the fishery was limited in about 1977. Along the West Coast of North America, this singular gear type management regime for herring harvest is unique to Sitka (Garza 1996). In accordance with the Limited Entry Act optimum number provision, the CFEC established the maximum number of participants in the Sitka sac roe fishery at about 50 permits.

1.1 Diversification of the Herring Fishery

In early 1998, about one third of the Sitka Sound sac roe seine permit holders organized an effort to support the development of a spawn on kelp alternative to the Sitka Sound sac roe herring fishery. Under the leadership of a native of Sand Point, Paul Gronholdt and Associates submitted BOF Proposal No. 441. The proposal sought to "Allow Sitka Sound herring sac roe purse seine permit holders the option of using open pound racks to harvest herring roe in the form of kelp in lieu of or in addition to using purse seines."

Purse seine permit holders in the group, contracted biologists and consultants went before the Board of Fisheries in support of proposal No. 441 in Sitka (January 1998).

The Board of Fisheries took no action on proposal 441, but acknowledged the potential conservation and economic benefits of the gear type. In order to explore several aspects of the proposed open harvest platform method, the Board requested that the Alaska Department of Fish and Game conduct an experimental fishery. ADF&G responded by designing an experimental fishery and soliciting bids for the 1998 season.

1.2 Experimental Fishery Terms

Terms established by the Department for conducting the experimental fishery required that the contractor deposit a \$64,000 bond with the department, have at least two years experience in the spawn on kelp fishery, and have an appropriate vessel, platforms and other equipment necessary for achieving the test fishery goals. To further ensure a successful outcome, the Department also required that the contractors provide a harvest, marketing and processing plan, and hold a letter of agreement with a licensed Alaskan seafood processor for handling the roe on kelp product.

The goals of the test fishery were to first produce a sufficient quantity and quality of roe on kelp from four rafts to generate \$336,000 in product sales to pay department and contractor's expenses. The project would serve as an opportunity for ADF&G to conduct resource research on both kelp and herring, as well as observe the fishery for environmental impacts, gear conflicts and subsistence interactions.



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Paul Gronholdt and Associates were awarded the test fishery contract on February 25, 1998. Comprised of 13 Sitka Sound herring sac roe permit holders, about 40 crewmembers, and five consultants, the "PGA team" commenced with mobilizing their vessels and open harvest platforms for the fishery in early March.





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Section 2.0 Results of the 1998 Experimental Fishery

From early March through mid-July, Paul Gronholdt and Associates carried out the experimental fishery, processing and marketing of roe on kelp as described in their contract with the Alaska Department of Fish and Game. The results of this coordinated effort were beneficial economically as well as informative to community members, the experimental fishing team and the ADF&G research and management staff.

The PGA team successfully transferred California OHP fishing technology to Sitka Sound, and adapted the method to Alaskan conditions. Sitka residents were able to observe the entire process and learn directly the logistics involved and impacts resulting from the alternative gear system. ADF&G researchers implemented their research plan with few changes, and obtained data upon which to base their analysis of the fishery.

Finally, the overall quantity and quality of the roe on kelp yielded by this fishery were very good, considering it was a first attempt at the fishery in Alaska. Sales of the product were sufficient to reimburse most of the PGA team's costs, and covered the entire ADF&G experimental fishery research budget.

Detailed records of activities involved in the experimental fishery are noted in the chronology in attachment D. The following section highlights the manner in which each facet of the fishery was conducted, notes any discrepancies from the original plan, and briefly explains the results of each phase of the operation.

2.1 Staging for the Test Fishery

The PGA team began staging for the test fishery in early March. Robert Glenovitch shipped his custom-manufactured aluminum roe on kelp rafts and other equipment from Bellingham to Sitka on the F/V Alicia Jo. Crew from the St. Zita assembled the rafts and moored them in New Thompson Harbor on March 13.

About 60 fish totes were stored on a barge leased from Excalibur Drilling. Located inside the Thompson breakwater, the barge served as a useful platform for the kelp stringing and open harvest platform loading operation.

2.2 *Macrocystis* Kelp harvest

High quality *Macrocystis* kelp is essential for the production of excellent herring roe on kelp. Desirable kelp blades are at least 6 inches wide and 20 inches long, with smooth margins, no holes and free of encrusting growth.

Although *Macrocystis* grows from Dixon Entrance to Icy Strait, mature blades meeting these harvest criteria in the early spring are not abundant throughout the plant's Alaskan range. On March 13 and 14, Darrell Kapp and crew inspected *Macrocystis* kelp beds around Baranof Island. No kelp of sufficient blade size and abundance could be located near Sitka Sound.

Kapp conferred with Bill Davidson about the situation and coordinated a team of kelp harvesters to travel further south. On March 15, Jim Beaton directed his crew on the F/V Starrigavan to depart Sitka for Sea Otter Sound. Kelp quality expert Warren Westrom

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screened several kelp beds and located a supply of mature *Macrocystis* about 120 miles south of Sitka. Beaton notified ADF&G of the harvesting site and schedule.

On March 16, PGA's biologist and two ADF&G technicians flew to the North end of Heceta Island where they rendezvoused with the Starrigavan crew. Two fishermen that live on Heceta Island were contracted to gather kelp for the fishery, and joined the team onsite.

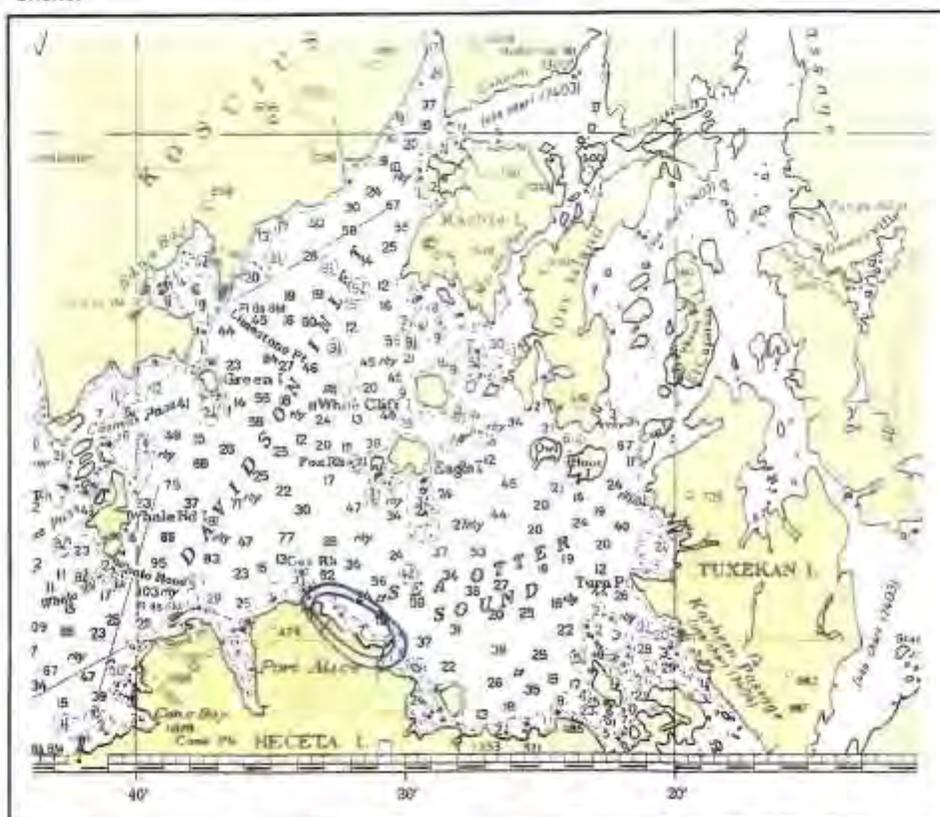


Figure 2.1 Nautical chart indicating the location of the North Heceta Island kelp bed. Nine people harvested about 4,000 *Macrocystis* fronds from this site in about 10 hours.

The following individuals participated in the kelp harvest at North Heceta Island:

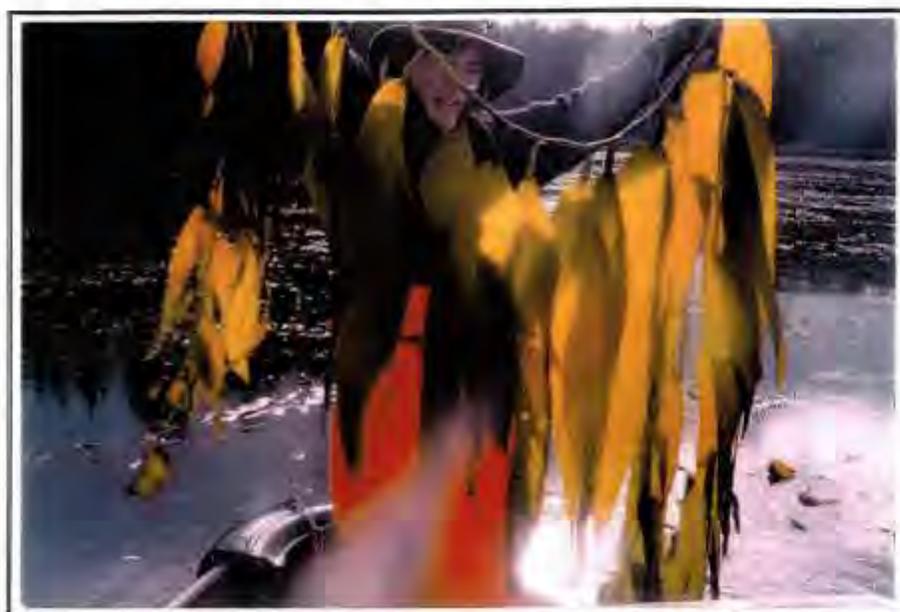
- Johnny Weyhmiller and crew
- Rob Miller, Sitka
- Charley Frisbee, Hydaburg
- Lee Morris, Captain
F/V Starrigavan
- Steve Frago, Crew, F/V Starrigavan
- Becca Johnston, Crew, Starrigavan
- Michelle Ridgway, PGA Biologist
- Warren Westrom, Kelp Quality Advisor
(Nicole DuClose & Eric Parker, ADF&G)

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The kelp team commenced with the *Macrocystis* harvest on the morning of March 16, and completed the task by 1900 hours that evening. All kelp used in the test fishery was harvested from one bed located at North shore of Heceta Island, about two miles SE from Gas Rock, at 55°49.43 North 133° 31.145 West (Figure 2.1). This site lies within ADF&G statistical area 103-90.

In accordance with contract stipulations Warren Westrom directed the kelp team to weigh and inventory each tote of kelp and maintain the kelp harvest logbook. Pursuant to ADF&G kelp harvesting regulations 5 AAC 37.300, the crew harvested *Macrocystis* from small skiffs by hand, removing only the upper portion of the fronds.

Westrom oversaw that kelp harvested met quality control standards. Frond sections taken were about six to eight feet long. The four to five newly formed blades at the tip of each frond are unusable and were trimmed off to reduce mucilage buildup in the totes.



Photograph 2.1 *Macrocystis* kelp harvesting in Sea Otter Sound, North shore of Heceta Island. Kelp blades are in good condition, but slightly smaller than preferred. PGA's biologist, Michelle Ridgway was monitoring the harvest and observing for impacts to the kelp resource and effects on marine mammals and birds in the area. 16 March 1998

A total of 10,236 pounds of kelp was harvested and transported in 40 standard fish totes. The ADF&G research team estimated that this consisted of 4,080 fronds with an average of 16 blades per frond, or 65,280 total blades.

The Starrigavan crew lashed the totes of *Macrocystis* to the deck, and kept them lidded during transport. Weather was rough through Chatham Straits, but the kelp arrived at Thompson Harbor in excellent condition.



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Kelp Harvest Impacts

The ecological effects of the kelp harvest were difficult to gauge. As there was no provision made for conducting a quantitative study of the kelp prior to harvest, both ADF&G field technicians and PGA's biologist made general observations of the harvest.

Ridgway photographed the kelp bed prior to and following harvest. Neither observations made on the day of harvest nor the photographs reveal that the bed had been diminished in any way. ADF&G biologists revisited the kelp harvest site on April 9, and reported that "there was no obvious impact on the kelp bed". Ridgway revisited the site in July and September. Based upon surface observations only, she did not see obvious signs of deterioration in individual plants or in the bed.

Even when harvesting fronds in the kelp bed, it was difficult to detect any reduction in the kelp biomass. However, it was obvious to all pickers when high quality blades became scarce in an area. Upon completing the harvest, we felt that we had taken most of the higher quality fronds from the kelp bed – which is about 1/3 square mile in size.

We assume that impacts to the kelp bed from this harvesting included some damage to the individual plants which were "pruned". Because only one or two fronds were taken from each plant, the *Macrocystis* plants will likely recover the lost biomass by summer's end.

Ridgway observed seals, cormorants, marbled murrelets, gulls and numerous seaducks in the bay during harvest activities. Three seals remained in the kelp while skiffs collected fronds, it did not appear as if they were disturbed at all. Other than the likely short-term disruption to the fish and invertebrate populations dwelling under the kelp canopy, it does not seem as if this year's level of harvest resulted in long-term damage to the kelp bed or the ecosystem it supports.

Kelp User Conflicts

Potential conflicts between the Spawn on Kelp Experimental Fishery and subsistence harvests of kelp or SOK on the West Coast of Prince of Wales Island was cited as a concern prior to the fishery (Comments to the Board of Fisheries by Dolly Garza, 1998).

The PGA team harvested kelp for the experimental fishery only at the Heceta Island site, many miles away from the traditional kelp harvest areas used by the communities of Craig, Klawock Sitka and Hydaburg (see figure 1 in the Executive Summary). There were no concerns or conflicts reported as a result of the kelp harvest.

2.3 Open platform fishing

The Starrigavan crew arrived with the *Macrocystis* in the evening on 17 March. The PGA core team of seine boat skippers and advisors met to review the kelp loading procedure and by 2100 hours mobilized their crews to begin work. The ADF&G staff were notified of project activities and were on site as the kelping procedure began.

Four seine boats anchored rail to rail in Thompson Harbor, near the Excalibur barge. In windy, cold weather, 37 crew members, boat captains and four contractors engaged in stringing and loading kelp on racks for 6 1/2 hours, completing the task at about 3 a.m.

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The kelp loading procedure involved the following steps:

- *Macrocystis* fronds were removed from totes and trimmed to 6-foot lengths
- A seine lead weight was attached to the bottom end of the frond, and a length of gangion line to the top end of the frond. The gangion was made off to a piece of groundline. Fronds were spaced about 1.5 meters apart along the kelp line.
- Lines bearing fronds were "coiled" into totes, much like baited longline gear
- The Merlin crew took fully loaded totes to the open harvest platforms, and "shot" the lines into place. From 37 to 43 lines were placed on each of four platforms, each line bearing about 28 fronds.
- Kelped platforms were then allowed to settle for about a day in Thompson Harbor



Photograph 2.2 Loading kelp; late night in Thompson harbor. Two assembly lines involving about three dozen-crew members prepared kelp fronds for suspension in the open harvest platforms. Weights and gangions were attached to each frond, and then fronds were attached to kelp lines on the four platforms. 3,858 fronds were fished in the experimental fishery.

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On March 19, vessels in the PGA fleet slowly towed two loaded kelp racks to fishing sites designated by Darrell Kapp with input from Subsistence Coordinator, Mike Miller. Details of the logistics involved in handling each rack during the fishery are provided in the Chronology (Attachment D), and in the interim report (Attachment E).

Rack K-1 was anchored in a small cove on the SE end of Middle Island, and K-2 was secured in a nameless cove on the SW end of Middle Island in the evening of 19 March (Figure 2.2). On 20 March, racks B-1 and B-2 were towed to anchorages on the north end of Kasiana Island and to North Magic Island. Later on the 21st, raft B-2 was tied to a private dock located on Halibut Point Road, where it remained for the rest of the fishery.

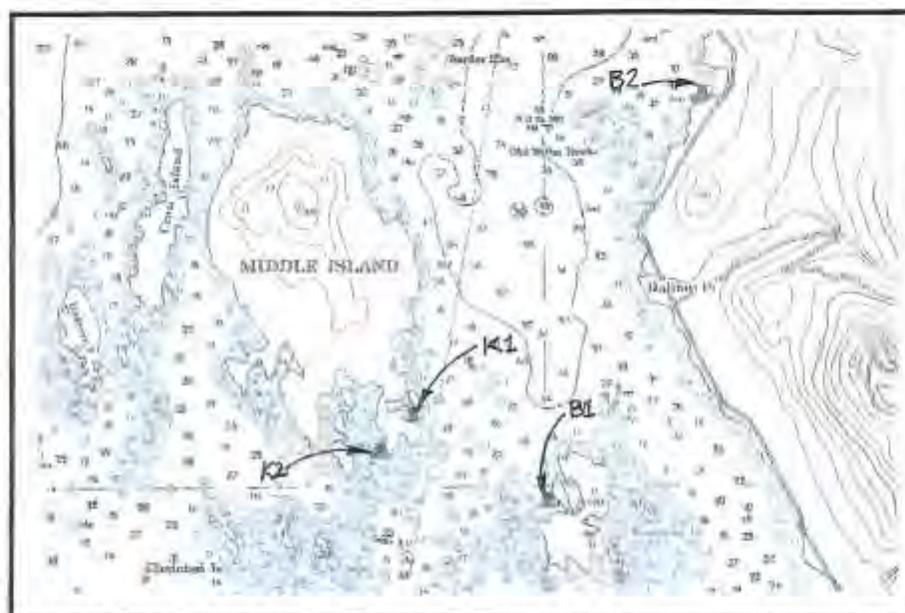


Figure 2.2 Location of each open harvest platform used in the SOK experimental fishery

All rafts were adorned with two to four blinking warning lights and signs displaying ADF&G permit numbers. Each raft was positioned near a steep beach, and tied to shore with one or two stout shorelines. The corners of each raft most distant from the beach were secured using 50-pound longline style anchors.

Spawn Deposition

1998 was an excellent spawning season in Sitka Sound. ADF&G reports that spawning in the Sound occurred from March 19 through April 12, with major spawning from March 21-25. Spawning events began earlier than usual, and over 65 miles of shoreline was spawned upon.

We observed spawning at every raft by the 21st of March. Schools of male and female herring milled around the rafts and, seemingly responding to the same cue, females

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began to deposit eggs on the kelp blades. Like a seamstress sewing stitches, each female laid her eggs on blades in rows. Males released milt in the rack areas on an intermittent basis. On March 23rd, the PGA team and ADF&G managers observed that most of Sitka Sound was a sea of milt.

While the gear was fishing, two dozen members of the PGA team shared the task of monitoring rafts for spawn deposition, observed and responded to subsistence fishing activities in the area, and generally guarded the platforms (see Chronology). Each raft was tended each night they were in place. The crew monitored spawn deposition at each site, and eventually lowered most kelp lines to improve blade exposure to spawning herring.

During the fishing period, representatives of the Alaska Department of Fish and Game, USFWS Protection, members and staff from the Sitka Tribe, and members of the general public from Sitka visited the roe on kelp rafts.

By March 23, all racks had from one to four egg layers deposited on most blades. At about 8 o'clock p.m, the Ryan D. Kapp towed platform number B-2 from the Halibut Point Road site about five miles to Cedar Cove in Katlian Bay. The raft was tended overnight while the product soaked to cleanse away excess milt.

On the 24th, the remaining three rafts were towed to Cedar Cove for soaking. Weather was calm, and product loss from the rafts during the tow was negligible. Seine boats towed the rafts at a speed of about 2 knots.



Photograph 2.3 Open Harvest Platform fishing! The PGA team inspected platforms several times daily. If upper blades were not receiving spawn deposition, ganglion extension lines, or "drops" were used to lower the kelp lines in the water column.

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Photograph 2.4 The condition of *Macrocystis* blades was closely monitored. Cool temperatures, high saline water and early spawning in Sitka contributed to the preservation of kelp quality.

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2.4 Roe on Kelp Product Harvesting

Five seine boats and their captains and crew gathered in Cedar Cove for harvest of the first rack on the morning of the 24th of March. We first worked with the ADF&G research team to tag randomly designated fronds for sampling and set up ADF&G's sampling station. About 30 people engaged in harvesting and packing roe on kelp for about three hours.

The team removed each frond from kelp lines, then snapped all blades off of the stipe or stem, stacked blades carefully and then packed them into standard-sized fish totes. ADF&G collected every marked frond for sampling and maintained counts of all fronds harvested. Totes full of roe on kelp blades were loaded on to the deck of a seiner, and taken to the Sitka Sound Producer's Cooperative for processing.

The crew harvested the three other racks in this manner on March 25thth. Weather was cold, windy, and sleeting occasionally. The harvest proceeded without incident of note. About 50 totes of roe on kelp were delivered to the SPC plant by evening of the 26th.



Photograph 2.5 Paul Gronholdt's F/V St. Francis positioning a kelp platform in Cedar Cove following a two-hour tow from the fishing grounds. The roe on kelp was allowed to soak in the mill-free waters for 12 to 24 hours prior to harvest to reduce product adhesion.

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Photograph 2.6 Product harvesting begins. Teams of kelp handlers worked from the decks of two seiners moored to the platform. ADF&G researchers have set up a sampling station on the aft deck of the Robert Glenovitch's St. Zita.



Photograph 2.7 Kelp "clotheslines" were hauled in and fronds removed gently to avoid breakage. Two to four herring egg layers were deposited smoothly on most blades.

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Photograph 2.8 Deck crews removed weights and gangion lines from each frond, then snapped blades from the attachment point to the stipe, leaving the pneumatocyst attached to the stipe.



Photograph 2.9 Herring Roe on Kelp Harvest: Blades were gently placed into fish totes for transit to Sitka Producers Cooperative, about two hours away.

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Photograph 2.10 Herring Roe on Kelp Harvest: Ungraded *Macrocystis* blades were stacked carefully to prevent egg loss during packing.



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2.5 Roe on Kelp Processing

Sitka Producer's Cooperative

Seine boats in the PGA fleet delivered about 50 totes of fresh *Macrocystis* blades laden with herring roe to the Sitka Producer's Cooperative on the 24th and 25th of March. 12,332 pounds of product were landed on 24 March, and 42,135 pounds were landed on the 25 March, for a total of 54,467 pounds of "raw" roe on kelp. Kanaway Seafoods Fleet Manager, Sandy Souter monitored the landings, recording weights of individual totes by raft. Per contract arrangements, landings were made on an ADF&G experimental fishery gear card (Attachment F).

An SPC crew of 8 to 14 people worked under the direction of Kanaway Seafoods SOK Operations Manager, Richard Walsh. This crew worked for about 7 days at the Sitka Plant. Crew size varied because some workers tended to intermittent deliveries of longline-caught fish to SPC. Processing at SPC would have continued an additional week or so, but specialized processing at an outside plant became necessary.

As described in PGA's Processing Plan, the crew proceeded to introduce a 100% brine solution into each tote following delivery. After initial brining, heavy depressors and lids were placed on the product, and totes were rotated until each attained the desired level of brine saturation. Absorption of salts from the brine is dependent upon kelp thickness and egg deposition consistency, and is therefore variable. Over the course of about 24 hours, totes were treated with two to four brining sessions.

Brined blades were trimmed, graded, drained in baskets and then weighed. Blade pieces were placed in pails by grade, and topped with a scoop of fine salt (Photographs 2.11 – 2.15). The target net packing weight was 34 pounds of product per pail. The crew filled each pail with brine and shook loose any air bubbles, then they sealed the pails with airtight lids for storage.

The product was held at about 20° Fahrenheit during all phases of storage, domestic shipping and transport overseas. The high salt content of the product precludes damage from freezing at this temperature.

Silt Setback

During the course of processing, the Kanaway team discovered signs of silt in the product. They inspected further and found that two rafts had been contaminated with very fine layers of silt either on the kelp or mixed in with the egg layers.

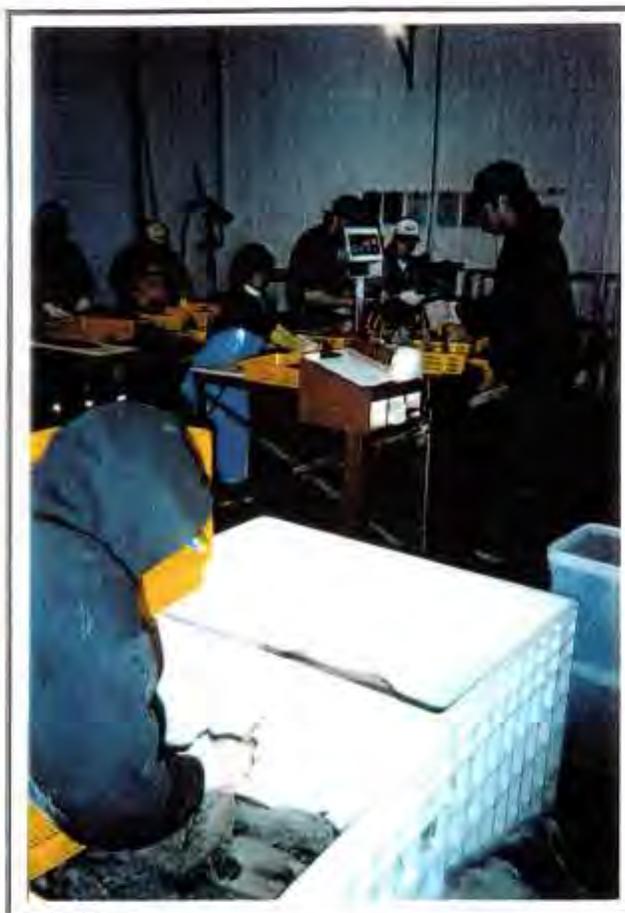
Silt contamination is unacceptable in the marketplace. Since SPC did not have the proper equipment for inspecting and cleaning silt from the product, the crew sealed brined totes from two silty rafts and shipped them south.

The crew palletized the processed pails and loaded them with brined totes into containers for shipment to Bellingham. Alaska Outport Transportation Association and Northland Services, Inc. transported totes of unprocessed product and pails of processed product from Sitka to Home Port Seafoods plant in Bellingham on April 11, April 20 and May 7.

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Kanaway Seafoods, Inc. Bellingham, Washington

Eight to ten crew processed Sitka Sound roe on kelp for about ten days. According to Richard Walsh, about five days of this time was consumed addressing the siltation problem. The cleaning effort was worth while, as it effectively salvaged the product and improved both grade and price.



Photograph 2.11 About 50 totes of SOK were harvested from Sitka Sound during the test fishery. Blades were treated with a saline solution until the product was saturated with brine. The Sitka Producer's Cooperative crew processed SOK from two rafts, and shipped totes from the other two rafts to Bellingham to remove fine silt with specialized equipment.

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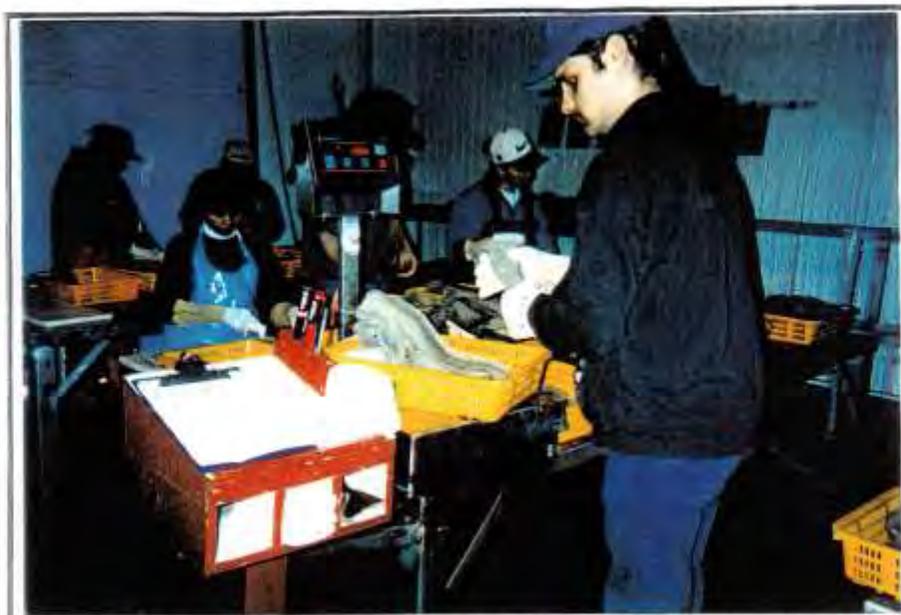


Photograph 2.12 Kanaway Seafoods processing experts guided Sitka Producers' Cooperative crew members in trimming and grading Roe on Kelp produced in the 1998 test fishery.



Photograph 2.13 Roe on Kelp grades are based upon kelp quality and size, and on thickness and uniformity of the herring spawn deposited on each blade. Sitka Sound SOK was of very good quality, and was well received by consumers in Japan.

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Photograph 2.14 The SPC crew drained and then weighed SOK into 17-pound baskets. Graded product was then consolidated into pails for shipment to Japan.



Photograph 2.15 Pailed SOK was topped with a scoop of fine salt, air bubbles were "bounced" out of the pails, and then each pail was lidded. This brined product was held at 20 degrees during storage and shipping. 57, 038 pounds of roe on kelp was produced during the test fishery.



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2.6 Product Quality Assessment and Marketing

Sitka Sound "Kazunoko Kombu" was graded both in Sitka at the SPC plant and at the Home Port Seafoods plant in Bellingham. Richard Walsh was responsible for directing all grading. All graded and pailed ROK was held at the Bellingham Cold Storage for buyer evaluation.

In advancing along the learning curve through the execution of this experimental fishery, some SOK grading criteria were not met. These are parameters which influence the ultimate price for the product and which can be improved upon in the future:

- Some *Macrocystis* kelp was too young and exuded mucilage such that eggs did not adhere well.
- The size of most of the blades used was slightly smaller than ideal – broader blades would have been more acceptable.
- The egg coverage was generally very good, some was not consistent
- Kelp "melting" – some kelp showed signs of deterioration at processing time.
- Silt was present in some of the product, even after extensive washing
- Egg sloughing, or "peeling" occurred in a small percentage of the product, and is related to kelp deterioration

Pacific Coast SOK Quality Comparison

Kanaway's Souter and Dan Nomura offered the comparison that Sitka Sound product was better than the quality of SOK harvested in California – which is graded at a scale about two levels lower than was PGA's product. Within the region, Souter and Nomura estimated that PGA's SOK not quite on par with BC production. Nomura indicated that the Sitka Sound area resources are of sufficient quality to potentially produce BC grade SOK, but the BC fishermen's technique is more refined for dealing with Northern roe on kelp production.

In Nomura's opinion, Hoonah Sound SOK is still top quality in southeast Alaska – so superior that it fills a unique niche for extremely thick, or "jumbo" SOK in the Japanese gift market. Both in quality and in price, Sitka Sound product quality is between that of Craig/Klawock and Hoonah Sound.

Product Purchase by Japanese Importers

Upon inspection of the lots in late June, Kanaway Seafoods concluded negotiations on the sale of the product with the Japanese buyers. Their apprehensions regarding the purchase of product from a new location and some concern over residual silt in the roe inspired a very thorough inspection of product quality. The buyers concluded that most of the product was of good quality for the target market. Buyers purchased the entire volume.



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Sales of the product were finalized on 29 June 1998. Dan Nomura provided the following information on weights and grades assigned to the product.

Summary of Kanaway Seafoods Final Production and Settlement Report Prices and Total Values Reported are Net, Less 3.3% Processor Tax				
Grade	Weight (pounds)	Percentage By Grade	Price per Pound	Total Value (\$\$\$)
1	11,821	21%	\$ 7.58	89,603.18
2	30,166	53%	\$ 5.78	174,359.48
3	9,078	16%	\$ 4.40	39,943.20
4	1,461	3%	\$ 3.21	4,689.81
5	1,233	2%	\$ 1.19	1,467.27
5P	1,137	2%	\$ 0.45	511.65
5T	2,142	4%	\$ 0.45	963.90
TOTALS	57,038	—	(avg. \$5.46/lb)	\$261,538.49

Once in Japan, Sitka Sound Roe on Kelp was fairly well received by retail buyers and consumers. The Japanese companies processed the brined ROK into a variety of products for distribution. Most of the product was sold to the more common restaurant and grocery store markets. According to Dan Nomura, a small amount of Sitka Sound product was sold through the gift market. Buyers reported that the products were broadly accepted alongside production from other locales (B.C, Hoonah and Craig).

Product Prices

Marketing consultant Dan Nomura conceded that the prices paid for the Sitka Sound product were lower than hoped for, but were acceptable considering market circumstances. The seafood market in general has been suffering from the low value of the Japanese yen, an unfavorable exchange rate, and the flagging Japanese economy. Since roe on kelp is a specialty market, it has suffered more than have markets for more essential goods. These factors, coupled with product unfamiliarity, yielded suboptimal prices for a developed product, but satisfactory prices for first year production.

Japanese importers have expressed an interest in purchasing SOK from Sitka Sound in the future. Nomura feels that this interest will support increased production of SOK from southeast Alaska. However, several significant hurdles must be addressed.

Based upon his recent research in Japan, Nomura has concluded that the corporate gift market for roe on kelp is shrinking, but prices remain high for the smaller volumes purchased in this market. Markets for thinner product, like that produced in Sitka Sound, are slowly expanding. A trend that began in 1997, in which a decrease in import prices led to expanding the market for these lower priced products, continues.

Most British Columbia and California producers currently cater to this market. About 1.5 year's of production from these sites is currently on inventory. Nonetheless, Nomura feels that if Sitka Sound SOK methods were refined to more specifically meet market



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needs for a thinner, everyday Kazunoko kombu product, there will be opportunities for building markets for more SE Alaskan SOK.

General factors influencing the current market climate for Kazunoko Kombu and which will influence market expansion opportunities in the future include:

- Supply quantity of competitive sources of Kazunoko kombu
- Product quality
- Economic conditions in Japan
- Market niche development
- Pricing
- Inventory/Carryover
- Level of marketing effort and effectiveness

These issues present a challenge to the future of roe on kelp fisheries in Alaska. Experts such as Dan Nomura and Alaskan seafood marketing authorities are optimistic that implementing a well-devised strategy for producing consistently high-quality product to fit the needs of the thinner style Kazunoko Kombu market will yield favorable economic results in the long term.



Section 3. Subsistence Fishery Interactions

Prior to the test fishery, subsistence stakeholders in the Sitka Sound region expressed apprehension regarding the potential impacts of the SOK fishery on traditional and customary uses of *Macrocystis* kelp, herring stocks and the roe-on-hemlock-branch personal use harvest. In response to these concerns, the Board of Fisheries directed ADF&G to require the contractor to carefully monitor the test fishery and endeavor to ameliorate any conflicts that might arise.

Macrocystis for the experimental fishery was collected miles away from traditional harvest areas near Craig, Klawock, Hydaburg, and Sitka. Therefore, there was no competition for kelp with the traditional and customary harvesters of kelp or roe on kelp in those areas.

PGA hired Mike Miller, member of the Sitka Tribe of Alaska, to serve as liaison between subsistence harvesters and the test fishery team. Miller participated in ADF&G planning discussions and tribal meetings before the 1998 herring season. Community members, city officials and others interested in the fishery contacted Miller before, during and after the season to have general questions answered from his local perspective.

Miller remained onsite in Sitka Sound during every phase of the test fishery (Photograph 3.1). In addition to monitoring subsistence activities in the Sound during the fishery, Miller also assisted subsistence harvesters who wanted to suspend hemlock boughs near or on the HROK platforms (Photographs 3.2, 3.3).

Miller communicated daily with PGA's onsite biologist, Michelle Ridgway. Miller received no reports of conflicts or complaints from members of the subsistence community at any time. Subsistence harvesters setting branches or harvesting wild spawn on kelp near the platforms said they had no difficulty working around the structures or attendant vessels. Excellent harvests were reported by subsistence harvesters collecting branches set on, near or miles away from the HROK platforms during the 1998 season (Photograph 3.4).

Concerns and questions from locals regarding the test fishery were also directed to ADF&G, the Sitka Tribe of Alaska leaders and staff, and to the City of Sitka. A summary of responses to the test fishery from these organizations follows.

Alaska Department of Fish and Game, Sitka Office

Dave Gordon, Bill Davidson and Doug Mecum directed the 1998 Test Fishery in Sitka Sound. They indicated that members of the Sitka community were interested in the fishery, and frequently asked questions about the new gear type. But no one from the public expressed having conflicts with the fishing team or their gear during the test fishery.

"Neither the department nor the contractor's liaison with PGA received any complaints from individuals participating in the subsistence harvest of SOK or roe on branches." Doug Mecum, Reporting to the Board of Fisheries in Wasilla, October 1998

Sitka Tribe of Alaska (Also see Attachment H)

Reported by Jude Pate, Legal Counsel for the Sitka Tribe of Alaska
and Jack Lorrigan, Biologist for the Sitka Tribe of Alaska

Jude Pate observed the test fishery through daily boat excursions to the test fishing grounds, and filmed many aspects of the fishery. He also solicited and documented the responses of Tribe members to the fishery during and following the season.

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Pate reported that the Sitka Tribal members involved in subsistence harvesting in 1998 reported "no conflicts with the 1998 test fishery participants or their gear". He conveyed that all test fishery participants were diligent in communicating with the Tribe, and are considered to have done an excellent job at conducting the test fishery,



Photograph 3.1 Paul Gronholdt, President of PGA, aboard the Tug Thunderbird – observing subsistence fishing near the test fishery platforms. All members of the PGA team shared in the responsibility of avoiding conflicts with traditional fisheries and adjusted test fishery operations as needed per PGA's subsistence liaison's guidance.

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Photograph 3.2 Sitka Sound area subsistence fisherman setting hemlock trees in an active herring spawning area for gathering herring eggs on branches at North Kasiana Island, March 1998. The trees were anchored with rocks and tied to trees on shore. Within three days these trees were covered with 4-5 layers of herring spawn.



Photograph 3.3 Subsistence fisherman, setting hemlock trees for subsistence harvest of roe on branches near an open harvest platform used in the test fishery. Miller and others fishing branches in the area had successful harvests and indicated that the platforms were not an obstacle to their gathering of herring eggs.

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Photograph 3.4 Sitka Sound area subsistence fishermen enjoyed an excellent harvest of herring eggs on homlock branches in the 1998 season. With over 60 miles of spawn in the Sound, there was a multitude of sites available near town for traditional egg gathering.



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Section 4.0 Environmental Considerations

The conservation merits of the open harvest platform roe on kelp fishery were evidenced during this experimental fishery. Relative to sac roe and closed pounding fisheries, there are some clear resource conservation benefits. It is beyond the scope of this report to analyze these conservation aspects or to assess environmental impacts incurred during the OHP fishery.

Rather, we report here our observations made during the fishery, and mention the research undertaken by the Alaska Department of Fish and Game. Some commentary on potential impacts of this fishery and contrasts with environmental concerns arising in other herring fisheries are discussed briefly.

Alaska Department of Fish and Game Research

In order to learn as much as possible about the OHP fishing method and the impacts of this experimental fishery upon herring stocks and the *Macrocystis* resource, ADF&G initiated a research plan during the spring 1998 season. Department statistician, Dave Carlisle, designed a randomized sampling program to estimate the total amount of herring eggs deposited on kelp blades. These data were used to estimate the total amount of herring "participating" in the OHP experimental fishery.

Sitka management biologists and their crew carried out the sampling plan, and other southeast technicians conducted the egg deposition counts. In addition, ADF&G staff was present for every phase of the fishery. They recorded field observations, which might provide insight into impacts of the OHP method (Photographs 4.1 – 4.3).

In their preliminary report, ADF&G estimated that 10.5 billion eggs were deposited on kelp blades in the fishery. Based upon results of their fecundity study, ADF&G estimated that 104 tons of herring were utilized in the fishery. The conversion of herring to pre-brine weight of SOK is 0.26.

ADF&G reported that PGA harvested about 10,000 pounds (5 tons) of *Macrocystis* kelp, which included 4,080 fronds, each with an average of 16 blades, for a total estimate of 65,280 blades. The Sitka Area Management Biologist and his staff visited the harvest site on the north shore of Heceta Island about six weeks following the harvest. They reported that "there was no obvious impact on the kelp bed".

ADF&G's detailed findings from this research and data analysis are forthcoming. A summary of their preliminary research results is presented in the Progress Report to the Board of Fisheries, dated October 16, 1998.

The *Macrocystis* Resource and Kelp Bed Ecosystem

Southeast Alaska harbors extensive beds of *Macrocystis* kelp, but the biomass, distribution, and ecological role of these kelp beds is not fully known. The increase of herring roe on kelp fisheries in recent years has created competition for high quality kelp blades that are mature at the time of herring spawning activity. After conducting the test fishery, the PGA team feels that there is good quality kelp in southeast to support the growth of the roe on kelp fishery. However, a strategy may be needed to ensure that every fishery group has access to high quality kelp at the time of their fishery.



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In other Pacific coast regions with active roe on kelp fisheries, harvesters and managers have encountered times when high quality kelp was not available in sufficient abundance to support the fishery. This dearth of kelp has been due in part to factors including inter-annual variability, low light in spring months leading to poor early season growth, and possibly overharvests. Kelp scarcity has been experienced in Canada and California. In order to continue producing roe on kelp in some areas, British Columbia recently allowed roe on kelp "pounders" to harvest kelp in marine parks.

We do not yet understand the impacts of *Macrocystis* harvests on the plant, the kelp bed, or the marine community this habitat supports. We feel that the selective harvesting of fronds from some plants did not impact the kelp bed extensively. Because the harvest occurred early in the growing season, it is likely that emergent understory fronds replaced the biomass harvested by late summer.

Ridgway's observations of the kelp bed in July and September suggested that this was so. Non-quantitative observations indicated there were no gaping holes or obvious signs of damaged kelp in the bed that was harvested.

Marine species flying or swimming near the kelp beds at the time of harvest did not seem to be disturbed. We presume that the use of outboard engines, coupled with surface canopy frond removals would cause motile species to relocate – at least temporarily. The broader ecological implications of this kelp harvest are not yet known.

Herring Resources and Health

Both environmental and conservation benefits of the passive OHP fishing method for the herring stock are numerous. As described in Mundy, *et al* 1998, we observed herring volitionally swim into the kelped platforms and voluntarily spawn on hanging kelp blades. The fish were never herded and the PGA fishing team did not observe any signs of the herring being stressed when spawning. Even in the presence of crewmembers on the rafts, herring proceeded with spawning at a leisurely pace. It was assumed that most fish spawning on OHP kelp had already spawned elsewhere, or were destined to do so following deposition on the "fishing" blades.

Thus, herring "participating" in the OHP fishery contribute to the genetic diversity and gamete abundance of the Sitka Sound herring stock, and they swim away to return for potential spawning in subsequent years. The effects of this fishery on herring therefore seem to be in the removal of an unknown percentage of each spawner's gamete production.

Some other potential environmental consequences of the OHP fishery include:

- Herring seem to be attracted to the shelter provided by the platforms – their migration or spawning on wild habitat may be altered.
- Anchors used to secure the rafts may have some impact on the benthic community, but this is assumed to be minimal.
- Some blades may break away from the platforms, and eggs may slough off of blades to the seafloor. This may attract scavengers, and the sloughed eggs may not hatch. The impact of this is assumed to be negligible.



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Based upon observations made during the experimental fishery, these impacts appear to be minimal and have no inordinate or long-lasting environmental consequences.

Comparison of Environmental Consequences in other Herring Fisheries

In contrast to other herring fisheries and unlike other roe on kelp methods, the Open Harvest Platform method is not lethal to herring or *Macrocystis* kelp. The OHP manner of harvesting results in a removal of gametes from the herring genetic pool and partial removal of biomass from individual kelp plants.

Herring involved in the traditional sac roe fishery are either killed, or are held while roe composition is determined, and then released. Ultimately, they are considered dead.

Seined herring introduced into closed herring roe on kelp pounds are allowed to spawn for several hours to several days. Because there is no reasonable means of counting the number of fish in the pounds, Commercial Fisheries Director, Doug Mecum, noted that "we are unable to regulate the amount of herring in each (closed) pound" (January 1998 BOF Meeting, Sitka).

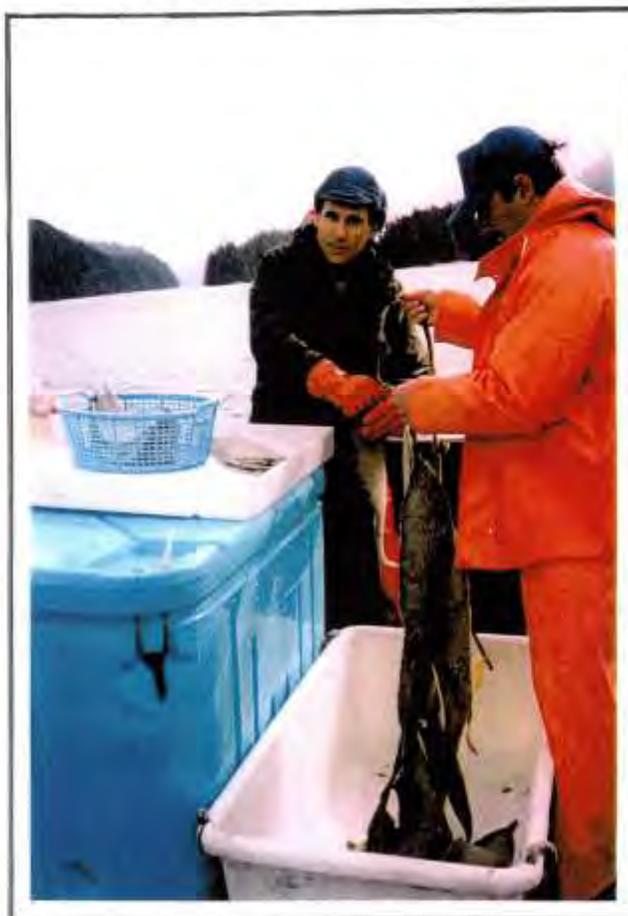
This situation has led to fishermen exceeding the herring quota in these fisheries on numerous occasions. Additionally, some fishermen and observers of the fishery report that the fish are clearly stressed while in the pound, and upon release.

Recent research in Prince William Sound has confirmed that closed pound herring have a high rate of viral infection. In 1998, this VHS virus was isolated from the water of three pounds in PWS in sufficiently high levels to transmit the disease to nonimmune fish.

Wild harvests of roe on kelp in Alaska involve the taking of whole seaweed plants using knives, rakes, or by handpicking. In contrast, *Macrocystis* is not killed or dislodged during harvest for use in the OHP fishery.

Because herring are neither crowded nor stressed when using the OHP method, the environmental consequences incurred in the sac roe and closed pound fisheries are not at issue. This sublethal take of both herring and kelp resources is more beneficial to the genetic integrity of those species and likely contributes to potential sustainable yield of those resources.

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Photograph 4.1 The Alaska Department of Fish and Game, Commercial Fisheries Division developed a rigorous research plan to gather data on the experimental fishery.



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Section 5.0 Economic Review

Although the 1998 experimental fishery was, by design, not a profitable endeavor for PGA, a review of the costs and benefits resulting from the fishery are useful for predicting the potential scale of economic impact the alternative fishery could have on Sitka. Benefits derived by the Sitka Community through the 1998 experimental SOK fishery included direct income to locals through short-term jobs, and moneys generated through taxes and retail sales of goods and services.

This section is not intended to serve as an economic analysis of the spawn on kelp industry. Figures on the revenues generated in the fishery are in section 2. Comparisons of the economic yields in various herring fisheries are reviewed in Mundy, Sharr and Ridgway, 1998. This section provides a synopsis of the types of expenditures incurred in the fishery, and an approximation of the labor force involved in each phase of the operation.

Sitka Area Jobs

An average of about ten local people worked at Sitka Producer's Cooperative processing roe on kelp for about seven days. They were paid through contractual arrangements between SPC and PGA. Four other southeast residents were contracted by PGA to assist with the kelp harvest (two from Sitka, two from the Craig area).

Eight to ten people worked on further processing at the Home Port Seafoods plant in Bellingham for ten days. Had the product not been silted, or if proper equipment had been available in Sitka to handle the silt-cleansing task, this employment would have been based in Sitka.

Two consultants from the Lower 48 and two consultants from southeast Alaska were hired by PGA for onsite monitoring of the fishery, to serve as local liaisons, and to report on performance of the test fishery. These contracts were for one to several weeks in duration.

In order to monitor and conduct research on the experimental fishery, ADF&G tasked southeast staff with project-specific duties. This resulted in additional work for field technicians, statisticians, lab technicians, and Sitka area management staff. Most of the additional staff time and associated costs were compensated for by the contractor's required surety bond with the State.

Overall Labor Force Involved in the Fishery

Fishing by the Open Harvest Platform method is very labor-intensive. Since most captains and crew were new to this fishery, the test fishery involved a great number of people for some parts of the operation. Over time, crews may become somewhat more efficient, but the sophisticated nature of the fishery requires a great deal of attention to detail, and always requires more labor than the direct harvest herring fisheries.

Based upon logbooks entries and notes made by PGA team members, the table below summarizes the estimated number of workers involved in each phase of the test fishery in 1998.



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Estimated Number of People Involved in the Experimental Fishery				
Phase of the Fishery	Number of People Involved *			Approx. Number of Person-Days*
	Total	PGA Crew	Contractors Or plant crew	
Mobilization and Staging	6	6	0	24
Kelp Harvest	9	4	5	11.25
Loading Racks w/ Kelp	37	31	6	27.75
OHP Fishing	10	8	2	40
Towing Rafts to Harvest	8	8	0	8
Harvesting in Cedar Cove	30	30	0	45
Harvest/Transport to SPC	6	6	0	9
Processing at SPC	8-12	0	8-12	70
De-Mob in Sitka	4	4	0	4
Processing at Home Port	8-10	0	8-10	90
Loading/Shipping to Japan	3	0	3	0.75
Marketing/Sales Effort	1.5		1.5	30
TOTALS	—	—	—	359.75

*Est. person days = average number of people X estimated # days worked on that task

General Expenditures in Sitka

Beyond the investment in equipment and costs to mobilize in Sitka, the PGA team incurred some expenditure while conducting the fishery in Sitka. These general costs included the following:

- Barge Lease
- Lodging for some PGA members
- Restaurants and groceries: (About 30 people for six days)
- Fuel for five vehicles and some vessels
- Three rental cars
- Taxicabs
- Entertainment
- Harbor Fees
- General purchases -- supplies

The community of Sitka received some benefits through city sales taxes. And 3% of the total ex-vessel price of the roe on kelp product was paid to the State in raw fish taxes. A percentage of this contributes to the City of Sitka's community apportionment of statewide raw fish taxes.



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Discussion and Final Remarks

The 1998 Experimental Fishery proceeded largely as anticipated. PGA's collective experience, as well as good weather and an early herring spawn contributed to the overall success of the fishery.

The roe on kelp suffered from the silt infiltration, but otherwise the product met expectations reasonably well. The price paid was sufficient to cover most costs for conducting the experimental fishery and associated research and management. The PGA team feels that the quality of product can be improved with increased monitoring of seawater conditions prior to and during the fishery.

The Sitka Community did not experience any resource user conflicts as a result of the fishery. Commercial and subsistence harvesters appeared to be either unaware of the fishery, or content with the manner in which it was conducted in Sitka Sound.

Within the scope of the PGA team's ability to observe impacts on the marine ecosystem, the fishery met many of the anticipated environmental and conservation goals. Neither fish nor kelp plants were likely killed in this "harvest".

Final Remarks

The quantity of Sitka Sound SOK available for harvest in the future is dependent upon the abundance of spawning herring and *Macrocystis* kelp and management decisions regarding their exploitation rates. The Alaska Department of Fish and Game, the Commercial Fisheries Entry Commission and the Board of Fisheries will determine resource assessment, quotas and allocation issues.

The overall market outlook is challenging. Experts conveyed that implementation of a strategic plan to tailor roe on kelp production to fit emerging market trends is necessary to ensure SE Alaska's product a niche in this specialty market arena. Participants in the 1998 experimental fishery concur that meeting these market needs with more refined Sitka Sound roe on kelp product is plausible. The PGA team feels that pursuing this market potential and hence diversifying the herring fishery management regime will provide broader economic benefits from this resource to the people of southeast Alaska.



ASSESSMENT OF *MACROCYSTIS* BIOMASS, QUALITY, AND HARVESTING EFFECTS
IN RELATION TO HERRING ROE-ON-KELP FISHERIES IN ALASKA



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and

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ABSTRACT

Interest in harvesting *Macrocystis* kelp for use in herring roe-on-kelp (ROK) fisheries is increasing, but information on the biology and ecology of kelp is limited for southeast Alaska. This is a report of a four month pilot study to evaluate the amount of kelp available for harvest and the recovery rates of kelp from harvest. Estimating the amount of kelp available consisted of first estimating the total abundance of kelp in a survey area and second estimating the biomass of available and desirable kelp. The total biomass was estimated by surveying the surface area of kelp beds in selected regions on the west coast of Prince of Wales Island. Randomly selected index beds were surveyed to determine kelp density, and samples were measured and weighed to estimate the average weight of kelp. An estimated 225,225 tons of *Macrocystis* kelp were found in the survey area. The harvest of kelp for ROK is highly selective. By comparing harvested to available kelp, it was found that blades at least 14 cm in width and fronds with a high proportion of desirable blades were selected. The proportion of blades and fronds meeting these selection criteria was estimated for the index beds, and the biomass of desirable kelp was estimated to be 32,663 tons or about 14% of the total kelp biomass in April. The growth in kelp canopy was rapid from March to April, with March canopies about 45% smaller than April canopies. Therefore, the biomass of desirable kelp in March was about 18,000 tons. Even if kelp harvests increase 10 times over present levels, the harvest will only represent about 3% of the lowest estimate of the biomass of desirable kelp.

There were few significant effects of experimentally harvesting kelp canopies in March and/or April. Kelp beds that were experimentally harvested at both times or only in April had shorter fronds and possibly fewer large fronds and fronds per plant. This experiment was monitored only one month after the last harvest, so there may not have been sufficient time for the cut kelp to fully recover. This preliminary experiment indicates that kelp recovers rapidly from harvesting in the spring.



INTRODUCTION

Kelp beds are a conspicuous element of the outer northeast Pacific Coast (Foster and Schiel 1985). All kelp belongs to the order *Laminariales* (*Phaeophyta*), and are made up of holdfasts, stipes, and blades. Some of the kelps produce floats that buoy them to the surface, these are known as the canopy forming kelps. The giant kelp, *Macrocystis* sp., is a well known canopy forming genus that occurs in much of the coastal Pacific Ocean. The terminology associated with *Macrocystis* is fairly complex as is the morphology (Figure 1), consisting of an attached holdfast with numerous fronds supporting numerous blades. *Macrocystis* often grows in thick beds that form a unique and important habitat.

Kelp beds play an important role in nearshore ecosystems in at least three ways (Duggins 1988). Kelp beds greatly increase the habitat complexity, increase sedimentation rates, and contribute large amounts of fixed carbon to the ecosystem (Duggins 1988, Duggins et al. 1989). Kelp beds provide as much as 15 m² of surface area for every square meter of substrate (Wing and Clendenning 1971), providing habitat for infaunal and epifaunal organisms (Duggins 1988). In addition, several species such as fish, mysids, and shrimp utilize kelp beds extensively (Coyer 1984). Juvenile and young-of-the-year fish may exhibit particularly strong, positive relationships with kelp beds (Carr 1991, Ebeling and Laur 1985). Kelp beds can also be significant sources of production, contributing large amounts of carbon in the form of attached plants, drift plants, particulate organic matter (POM), and dissolved organic matter (DOM) (Duggins et al. 1989). This carbon production is not limited to kelp beds as some of the unattached plants drift outside of the bed with some pieces drifting miles from the source bed. In areas with lush kelp beds, about 50% of the total carbon in some fishes and birds is derived from kelp primary production (Duggins et al. 1989). Finally, kelp beds alter the flow of water in and around the bed (Jackson and Winant 1983). This altered flow results in higher sedimentation rates that may increase suspension feeding and recruitment of planktonic larvae. Altered flow caused by kelp beds may also increase the availability of planktonic food sources, such as barnacle cyprids, to resident kelp bed fish (Gaines and Roughgarden 1987).

The morphology of kelp blades has been shown to be dependent upon water movement in many kelps (Norton 1969, Druehl 1978, Norton et al. 1982, Koehl and Alberte 1988). In low flow areas, blades generally have more undulations, are larger, wider, and are not split. *M. integrifolia* shows similar plasticity in growth form (Druehl 1978, Hurd et al. 1997). This plasticity in growth form is highly functional. Undulations dramatically increase drag forces, resulting in higher blade mortality in high flow regimes, but in low flow areas the undulations serve to increase nutrient uptake by initiating turbulent flow around the blade (Hurd et al. 1997). Also, larger blades are better able to gather light but cannot withstand the drag and accelerational forces exerted by wave action (Denny et al. 1985).

There has been interest in harvesting kelp for various purposes on the Pacific Coast of North America since at least 1911 (Foster and Schiel 1985). In California, about 100,000 tons of kelp are harvested annually for various products. Harvesting north of California has been sporadic, with few large scale commercial harvests. In British Columbia and Alaska *Macrocystis* kelp is harvested to support the herring roe-on-kelp (ROK) fishery. Since the price paid for the end product is dependent upon the quality of the kelp blade, harvesting kelp for ROK is highly selective. In particular, fronds with many wide blades are desirable.

The research described here was initiated due to interest in harvesting kelp for a roe-on-kelp (ROK) fishery near Sitka, Alaska. A proposal was made by commercial harvesters to the Alaska Board of Fisheries in 1996 to allow Sitka Sound herring sac roe purse seine permit holders the option of using open pound racks to harvest herring roe on kelp. This would be in lieu of, or in addition to, using purse seines. The board took no action on the proposal at their 1997 meeting, but requested that the department conduct



an experimental gear test fishery. The department conducted the test fishery in 1998 focusing on management issues related to the pound fishery and the gear. A second test fishery was conducted in 1999 primarily to fund the kelp research described here, as well as to revisit some issues related to fishery management. A second proposal to allow for a roe-on-kelp fishery in the Sitka area will go before the board at their 2000 meeting.

An understanding of the abundance and dynamics of giant kelp, *Macrocystis* spp., is essential to manage the use of this alga for existing and emerging herring ROK fisheries. Kelp harvests in Alaska are currently being managed with limited knowledge of kelp abundance, growth, or recruitment. In conjunction with other roe-on-kelp fisheries, the Sitka Sound open harvest platform herring roe-on-kelp test fishery presents the possibility of greatly increasing the harvest pressure on *Macrocystis* kelp resources. At least two pieces of information are needed to properly manage kelp harvests in Alaska, 1) the amount of kelp that is available and desirable for harvest, and 2) the effects of harvesting on kelp beds and associated communities. This report provides a preliminary assessment of the abundance of *Macrocystis* kelp resources in Alaska. Also, the results of an experiment assessing the short term effects of harvesting on kelp beds and the ability of kelp beds to recover from harvests are reported.

METHODS

Standing Crop Estimates

Aerial Surveys

Aerial surveys of kelp beds on the west coast of Prince of Wales Island were conducted between March 23-29, 1999 (Figure 2). The coastline was surveyed by Scott Walker, an experienced ADF&G herring spawn recorder. During the flight all significant *Macrocystis* kelp beds were marked in red pen on black and white charts by the surveyor, recording the approximate outline of each bed. The area around Duke Island and Tree Point was surveyed on 11 June 1999.

The resulting maps with marked kelp beds were analyzed to ascertain the surface area of kelp beds. The original maps were scanned into digital format (Figure 3), and an image that included only the red "kelp beds" was produced from the original scanned image (Figure 4). These two images were produced with Adobe PhotoShop. Using an image analysis program (Optimus), the original image was used to scale the red only image, using landmarks of known length. An averaging procedure (5x5 pixels) was applied to the red-only image to eliminate small lines, numbers, and letters within the red patches. The red patches were then automatically outlined, and any remaining unwanted "holes" or other images were removed by hand. The image analysis program then determined the total area of mapped kelp beds and the data were downloaded to Excel for analysis. The Duke Island and Tree Point survey was not analyzed due to relatively low *Macrocystis* abundance and limited time.



Index Beds

One index bed was randomly selected from each subdistrict surveyed, resulting in a total of 11 index beds. To select a bed, a randomly placed point was located in each subdistrict. The bed that was closest to the point and was at least 20 m² in surface area was selected. To estimate the growth of beds during the spring, these index beds were photographed during the March aerial survey and on April 28, 1999. Photographic methods were consistent between dates and the altitude was recorded for each photograph. For each index bed, a pair of photographs, one each from March and April, were selected based upon similarity of photograph angle, direction, and altitude. The photographs were scanned into digital format and analyzed using Optimus image analysis program. All canopy forming kelp was outlined by hand using the image analysis program and the total area of kelp plant canopy (excluding water area between fronds) was obtained. This is not the same measure of the surface area of beds obtained from the hand-drawn bed maps in March which includes water area between fronds.

The April photographs were calibrated using a photograph of an object of known dimensions taken from the same altitude. The March photographs were calibrated by measuring a distinctive object in the April photograph and using the same object as a scale in the March photograph. This procedure insured that each pair of photographs were calibrated similarly. If the calibrations were off, they were off by the same amount for each date so between date comparisons could still be made.

To estimate the length of fronds and the density of plants and fronds, four index beds were visited between April 19-24. The density of kelp in each bed was estimated by scuba divers. Six transects were oriented perpendicular to the long axis of the bed and placed at even intervals along the length of the bed. If transects were longer than 20 m, then 20 m long sections were sampled at the inside edge, outside edge, and approximate center of the transect. The total length of the transect was recorded as well as the distance between transects. The start and end depths of each transect were also recorded. Divers swam along transect lines and counted the number of large (>1.5m) and small (<1.5m) *Macrocystis* fronds for each holdfast encountered within one meter of the transect line. Every tenth frond was measured for length starting with the tenth frond.

Commercially Harvested Bed

Kelp was harvested for the Sitka Sound open harvest platform test fishery from a bed on the northeast side of Port Alice in Sea Otter Sound (Figure 2). This bed was surveyed by scuba in March just after the harvest and again in April as part of the index bed survey. The methods of survey were similar to the methods used for the index beds. The total harvest taken from this bed was recorded.

FronD Biomass

To estimate the average weight of fronds, 22 fronds of varying length were weighed and measured. The fronds were cut into 1 meter sections starting from the tip and working towards the base. The weight and section number were recorded for each section. At the base, the length of the final piece was also recorded. Thus, the total weight and length of each frond could be determined.



Total Biomass Estimates

The total biomass was estimated by multiplying the total surface area of kelp beds (March) by the average density of large fronds (April) and the average weight per frond (April). The average weight per frond was estimated by multiplying the ratio estimator of average frond weight/average frond length from the weighed fronds by the average length of fronds in the index beds. The relationship between frond length and weight was linear and had a zero intercept, so using a ratio estimator was appropriate. The surface area of the beds drawn in March was assumed to remain constant through April for purposes of this calculation.

An estimate of the variance associated with the total biomass estimate was generated by combining variance estimates for both frond density and average frond biomass. Frond density averages and variances were weighted by bed size (Cochran 1977). The variance associated with the average frond biomass was calculated using the methods of Barnett (1991).

Estimated Versus Harvested Biomass

Two small beds were surveyed by scuba divers to assess the accuracy of the biomass estimates. The beds were small (<150m²) enough that an entire frond count census was completed for each bed in one day by two scuba divers. Every tenth frond was measured for length. After surveying, the canopy was harvested from both beds and the total frond biomass was harvested from one bed. All harvested material was weighed. Thus, the estimated biomass from scuba sampling could be compared to the actual biomass obtained by harvesting.

Desirable Biomass

Blade Morphology

The morphology of individual kelp blades was examined to assess the desirability of kelp. Three fronds from each of ten systematically located points in the Port Alice bed were collected before any commercial harvest occurred. The tenth, fifteenth, and twentieth blades from the apex were detached and measured. The youngest free blade was counted as blade number one. The total length and maximum width of each blade were measured. In addition, the number of holes in the blade, the general condition of the blade, and the presence or absence of epiphytes and silt were recorded. The harvested kelp was also sampled. Forty haphazardly selected fronds were collected from the harvested kelp and three randomly chosen blades were sampled. The morphology of blades sampled before harvest was compared to commercially harvested blades to determine the criteria used to select blades sampled.

Fronds were collected from the four visited index beds to determine the proportion of desirable blades over the entire region. Fronds were collected over dive transects. The initial goal was to collect a frond at three locations (inside edge of bed, outside edge of bed, and in the center of the bed) along each transect,



but time constraints often reduced the sample size. Blades were then sampled in the same manner as the blades in the harvested bed.

Fronde quality was assessed by comparing the number of desirable blades out of the three sampled blades between fronds from various locations. As with blade morphology, frond selectivity was determined by comparing the fronds available in the harvested bed before harvest to the fronds actually harvested. The proportion of fronds desirable over the entire region was then determined by using the sampled fronds from the index beds.

Biomass Estimates

The biomass of desirable kelp was estimated by multiplying the total area of kelp beds by the density of desirable fronds by the average weight of fronds harvested. The density of desirable fronds was estimated by multiplying the total frond density by the proportion of fronds that were available and the proportion of fronds desirable obtained from the index bed surveys. Available fronds were defined as those that were at least 5.3 m in length. This definition was needed to eliminate those fronds that did not reach the surface (average depth of about 3 m) and have enough additional length to harvest (2.3 m, obtained from the average length of harvested fronds).

The variance component of the biomass estimate was obtained by combining variance estimates from the average weight of harvested fronds and the average density of available and desirable fronds.

Effects of Harvesting

Experimental Design

The goal of this experiment was to assess the impact of harvesting on kelp beds. Three kelp beds in the Craig area were used (Figure 2), and four 20 m transects were permanently established in each bed perpendicular to the depth contours. Kelp density was estimated using the techniques described above for index beds for each study plot before any treatments were assigned.

All transects were marked, numbered, and surveyed between 24-25 March 1999. After the initial survey, the experimental treatments were assigned to the transects. There were four experimental treatments, 1) March harvest (early), 2) April harvest (late), 3) March and April harvest (early+late), and 4) an unmanipulated control. Each of the four treatments were randomly assigned to the four plots in each bed. After treatments were assigned, the plots receiving the early and early+late treatments were harvested by cutting all fronds around the mean low water mark. An 8-meter wide swath centered on the transect line was harvested. The late and early+late plots were similarly harvested after sampling in April. All plots were resurveyed using the standard dive measurements on 24-26 April and 15-16 June 1999.



RESULTS

Standing Crop

Aerial Surveys

The aerial survey identified 751 distinct beds from eight regions on the west coast of Prince of Wales Island (Table 1). The average bed size over the surveyed area was 46,936 m² ranging from 415 to 886,774 m². More than 35 million square meters or 3,524 hectares of kelp beds were surveyed (Table 1). It should be emphasized that this is only a partial survey of *Macrocystis* kelp on the west coast of Prince of Wales Island. It is estimated that this survey represents about 60% of the kelp in this area. In addition there are kelp resources around Baranof Island, Sumner Strait, Kuiu Island, and Duke Island but the area of these resources is unlikely to exceed the kelp beds on the west coast of Prince of Wales Island. In 1913, Cameron (1915) estimated there are about 45,300 acres (18,332 hectares) of kelp in southeast Alaska, but only a small portion of this was *Macrocystis*.

Density Estimates

Many characteristics of kelp populations at the index beds were evaluated using the information from scuba surveys (Table 2). The selection of Port Alice was heavily biased and the scuba surveys reflect this bias. The density of plants, large fronds, and frond length were all greater at Port Alice compared to the index beds (Table 2). The density of small fronds and the number of fronds per plant at Port Alice were both within the range observed at index beds. The overall density of individual plants was about 0.34/m² (excluding Port Alice data). There were more large fronds (mean of 2.44/m²) than small fronds (0.46/m²) at all index beds. The number of fronds per plant ranged between 3.8 and 12.5 with an average of 9.3. Excluding Port Alice, frond length was relatively constant between sites and averaged 6.1 meters.

The average depth of the 4 index and 3 experimental harvest beds was 3.28 m below mean low water (MLW), ranging from 1.25 to 6.13 m below MLW. The depths at Port Alice were greater than at the index beds ranging from 4.27 to 9.45 m below MLW and averaging 7.08 m below MLW.

Frond Biomass Estimates

There was a linear relationship between the length of a frond and its weight (Figure 5). Length was a good predictor of weight, explaining 88% of the variation in frond weight. Since a plant of zero length cannot have any mass, the intercept must be zero. In this case a ratio estimate (average weight:average length) is a simple method to estimate average frond biomass from a sample of lengths. The ratio generated from the data in Figure 5 is 0.39 kg/m. The average length of fronds at the surveyed index beds was 6.11



meters, so the average weight per frond was 2.37 kg. ($0.39 \text{ kg/m}^2 \times 6.11 \text{ m}$). The variance about this estimate was 0.065, calculated using Barnett's (1991) method.

Total Biomass

The estimated biomass of kelp in the areas surveyed was 204,319,652 kg (225,225 tons) with an 80% confidence interval of $\pm 43,802,512 \text{ kg}$ (48,284 tons). Based upon the weight per unit area, this estimate corresponds to "very thin" beds reported by Cameron (1915) and the June harvest yields of Coon (1982).

Estimated Biomass Versus Harvested Biomass

The estimated biomass at both beds was greater than the actual harvested biomass (Table 3). At Pt. Idefonso, only the canopy was harvested, so the biomass below the harvest level was left. This site, however, was only 2-3 m deep, so the amount that was left was minimal. Not all of the harvested material was weighed as some fragments drifted away before weighing.

Desirable Biomass

Blade and Frond Quality

The harvest of kelp for the roe-on-kelp fishery was highly selective with both blades and fronds being chosen for high quality. According to Richard Walsh (personal communication) of Home Port Seafoods in Bellingham, Washington, the two most important factors in grading kelp blades is the overall health and the blade width. For the 1999 SOK fishery, kelp blades in the 14-16 cm size range or higher were selected relative to the blade widths available in the bed (Figure 6). At Port Alice, blade widths in the bed did not change between March and April (Figure 7), but blade areas increased from March to April, indicating that blades grew in length but not width (Figure 7). The width of blades varied between the index beds (Figure 8). Eagle Island had narrow blades with few blades wider than 16 cm. Those blades that were wider than 16 cm were often torn and broken. There was a higher percentage of both narrow (<14 cm) and wide (>20 cm) blades at Harmony Island relative to Port Alice. The few samples taken at Balena Island indicate that most blades were in the 14-18 cm range. At Port Real Marina, blades were very wide with almost all blades more than 16 cm wide, but most blades at this site were covered with fine silt or damaged by grazers.

To evaluate the quality of fronds, the three blades sampled on each frond were rated as desirable or undesirable. A desirable blade had to be at least 14 cm wide, have few small holes, no large holes, free of silt, and not torn. Virtually all of the harvested fronds from Port Alice used in the test fishery had 2 or 3 desirable blades of the 3 sampled (Figure 9), and the percentages used in these two categories were



greater than the available fronds in the Port Alice bed. In the index beds, 38.7% of blades had 2-3 desirable fronds. Most of these desirable fronds were found at one index bed.

Available and Desirable Biomass

To determine the biomass of kelp available and desirable for kelp harvest, both the density of large fronds and the weight per frond needed to be adjusted for the selection of fronds. The density of fronds available for harvest was calculated by multiplying the total large frond density by 51.25%, which is the proportion of fronds that were longer than 5.3 m. The threshold length of 5.3 m was deduced as follows: The average depth of beds surveyed by scuba in this study was rounded down to 3 m below MLS, and this length was added to the average length (2.3 m) of the cut segments of fronds harvested for the Sitka ROK fishery. That is, a frond must be at least 3 m to get to the water surface and then be an additional 2.3 m to make the frond worth harvesting. Thus, the estimated density of available fronds was the average frond density, (2.45 fronds/m²) (Table 2), times the proportion of fronds longer than 5.3 m (0.5125) with a result of 1.26 available fronds/m². The proportion of desirable fronds in the index beds was 38.7%. Therefore the density of available and desirable fronds is 1.26 available frond/m² times 0.387, equal to 0.486 available and desirable fronds/m². The average weight of harvested fronds was 1.73 kg/frond. Thus, the biomass of available and desirable fronds in the surveyed area in April 1999 was 29,631,711 kg with an 80% confidence interval of $\pm 20,161,522.8$ kg, or about 14% of the total kelp biomass.

Growth of Beds - March to April

The canopy cover within all index beds increased from March to April (Table 4, Figure 10). The percent increase in cover ranged from 12% to 311% with a mean increase of 82%. Thus, beds in March will average about 45% less canopy than beds in April. If there is a linear relationship between canopy cover and biomass, then the April biomass estimate can be appropriately reduced to obtain a March biomass estimate. Decreasing the April biomass estimate by 45% results in a total biomass in March of 112,375,808.4 kg and a desirable biomass in March of 16,297,441.3 kg.

Effects of Harvesting

Over three months there were few detectable effects of harvesting upon *Macrocystis* plants or beds (Figure 11). To account for variation in the starting densities or lengths, differences between the June sampling date and the pre-harvest March sampling date were statistically analyzed (Table 5). Average frond length was significantly lower on plots harvested later in the season compared to the early harvest or control plots (Figure 11F, Table 5). There were also marginally significant decreases in the density of large fronds and the number of fronds per plant in the plots harvested in both March and April (Figure 11C, E, Table 5). There were no detectable effects of harvesting on the densities of plants, small fronds, or juveniles (Figure 11A, B, D, Table 5).



DISCUSSION

The total biomass estimate is made up of aerial surveys of the extent of kelp beds, estimates of frond densities, and estimates of frond weight. Each of these three components can contribute to errors in the biomass estimation. Any error inherent in the aerial survey methods was not quantifiable, so the estimate of total kelp bed area was treated as a census with no error in the analysis. There may have been errors in recording the extent of individual beds during the surveys with some beds being overestimated in size and others underestimated. Also, there may have been errors in identifying *Macrocystis* beds. Some *Nereocystis* beds may have been included in the survey, resulting in an overestimate of *Macrocystis* area. Conversely, some *Macrocystis* beds may have been identified as *Nereocystis* beds, resulting in underestimation of *Macrocystis* bed area. Without performing multiple surveys over a single area, it is impossible to estimate these sources of error. A more accurate and efficient method of estimating the area covered by *Macrocystis* needs to be developed. Aerial photography from belly or wing mounted cameras using infrared film would eliminate errors in canopy area estimation and has been used in British Columbia (Foremen 1975) and in Alaska (M. Ridgway, Oceanus Alaska, personal communication).

The error estimates for total biomass were obtained from a combination of the estimates for frond density and frond weight. Frond density estimates made up about one third of the error estimate for total biomass while the frond weight estimates accounted for the remaining error. The disparity between the error contributions of frond density and frond weight indicate that relatively more effort should be devoted to sampling frond weight. A more efficient approach would be to have fewer transects per bed (about 5), sample more beds, and sample about 30 more fronds for weight and length. However, the precision of the sampling was within 22% of the mean with 80% confidence intervals, indicating a reasonable estimate of the total kelp biomass in the surveyed area.

For the two small beds examined, the biomass estimated by scuba surveys was higher than the harvested biomass. Part of this difference was due to handling the fronds in the process of weighing, resulting in the loss of an unknown amount of material. Only the canopy at Point Ildefonso was harvested, so some of the estimated biomass was left on the sea bottom. With these sources of error, the harvested biomass may have been within the range of variation of the estimated biomass. More beds need to be surveyed and harvested to determine if the scuba surveys consistently overestimate the available biomass.

Estimating the amount of kelp desirable by the ROK fishery proved difficult. The quality of kelp blades is mainly dependent upon blade width and blade health, defined by the absence of holes, tears, and debris. In addition, fronds with a high proportion of desirable kelp blades are selected over other fronds. Since blade and frond quality can only be assessed by field sampling and the estimates for the proportion of desirable kelp reflects sampling from only four beds, the precision of the biomass of desirable kelp was quite low ($\pm 68\%$). More beds need to be surveyed to make more accurate estimates of desirable biomass.

Blade morphology is dependent upon wave exposure and currents (Druehl 1978, Hurd et al. 1997), so it may be possible to predict the quality of blades in kelp beds if the exposure of the bed is known. The water flow regime for any particular area depends upon many factors including the fetch, bottom topography, local land masses, and the wind regime. It may be possible to sample blades and fronds in a variety of kelp beds varying in exposure and relating the blade morphology to a derived exposure index. The health of kelp blades also seems to be indirectly dependent upon water flow. Both grazing and fouling seems to be greater in protected areas. Waves may limit the activities of herbivores (Menge and Sutherland 1976) and prevent fouling organisms from colonizing. Thus, in very protected waters, as at Port Real Marina, kelp blades may be wide but their quality may be low due to severe grazing and



fouling. At the exposed Eagle Island site, few grazers or epiphytes were observed on the sampled kelp blades.

The canopy area of kelp beds declines in winter and reaches a maximum in late summer (Harrold and Reed 1985, Foster and Schiel 1985, Dayton 1985, Watanabe and Harrold 1991). Thus, kelp canopies increase in area during the spring months. The extent of kelp canopies increased by an average of about 82% from March to April. The canopy available for harvest in March is about 55% of that available in April. Since the Sitka Sound herring typically spawn in March, the kelp available for herring ROK is much less than that available for later herring fisheries.

The estimate of bed surface area, obtained in March, is surely a conservative estimate of bed area in April. Because the March estimate was used in the calculation of total biomass in April (using April estimates of average frond density and mass) the total biomass estimate must be regarded as conservative.

Effects of Harvesting

The effects of harvesting kelp have been examined in numerous studies. Of the studies surveyed here, five were done in *M. pyrifera* beds in California (Miller and Geibel 1973, Kimura and Foster 1984, Barilotti et al. 1985, Barilotti and Zertach-Gonzalez 1990) and Chile (Santelices and Ojeda 1984), and two were done in British Columbia in *M. integrifolia* beds (Druehl and Breen 1986, Coon and Roland 1980, Coon 1982). Of these seven studies, all but one (Coon and Roland 1980, Coon 1982) suffer serious flaws in experimental design. None of the remaining six studies were replicated and each harvest treatment was represented by a single area or bed and compared to a single control area. All but one of these unreplicated studies were guilty of pseudoreplication (Hurlburt 1984) by applying inferential statistics to replicate samples within one experimental unit. The remaining study (Druehl and Breen 1986) did not use statistics in their study and differences were judged by intuition and experience. The results of these studies are frequently contradictory. For example, harvesting kelp has shown increases, decreases, or no change in kelp growth, holdfast growth, frond production, and plant survivorship. Hence, the results must be interpreted with extreme caution.

Of the studies that examined recruitment, all found that recruitment increased when kelp was harvested. The only significant effect observed in this study was a decrease in the average length of fronds in harvested areas. The lack of significant results in this study does not necessarily indicate that there was no effect of harvesting, but may be a result of low replication of treatments. Also, the experiment has only been monitored once, two months after harvest, so any long-term effects have not been determined. This experiment implemented the maximum harvest possible under current regulations, and the lack of detectable effects indicates that the more limited harvest done by the ROK industry may have little effect on kelp beds. These experiments need continued monitoring and expansion to estimate potential long-term effects of harvesting on kelp bed and associated communities.



CONCLUSIONS

This study has provided some preliminary answers to the questions of 1) how much kelp is available and desirable for harvest, and 2) what are the effects of harvesting on kelp beds and associated communities? There appears to be enough kelp available in the surveyed area to support all Sitka Sound herring purse seine permit holders harvesting ROK with the following assumptions. There were more than 225,225 tons of kelp identified in this study. There are 51 permit holders in the Sitka Sound purse seine herring fishery. If each were permitted to conduct an ROK operation and if each harvested 5 tons of kelp (hypothetical amount based upon the test fishery), then the total kelp harvested would be 255 tons. Total *Macrocystis* harvests to support other ROK fisheries in Alaska (Craig, Hoonah Sound, Prince William Sound, and Nome) were 25 tons in 1998, and as high as 44 tons in 1992. If harvests for all of these fisheries, plus the Sitka fishery, were to occur in one season, the total harvest would still be less than 300 tons. This represents about 0.1% of the biomass of *Macrocystis* in the surveyed area. If the kelp harvests are not concentrated in any one bed or area, there is a low probability of depleting the kelp resource. In addition, the effects of the most severe harvesting allowed are apparently minimal. A more complete survey should be performed to survey all of the *Macrocystis* resources in Alaska. If a good photographic system is developed, a thorough survey should be practical. In addition, kelp density should be monitored yearly on a few representative kelp beds to ascertain yearly fluctuations in kelp density. Kelp beds often have dramatic yearly changes in abundance that are related to El Nino events (Dayton et al. 1984, 1992, Dayton and Tegner 1984, Tegner and Dayton 1987, 1991).

Increasing the demand for high quality kelp may result in conflicts among users for more desirable kelp. Of the 225,225 tons of kelp surveyed only about 14% of this kelp was deemed desirable to the ROK industry. A total harvest of 300 tons would represent about 1% of the estimated amount of desirable kelp available; however, the estimate for the amount of desirable kelp is very uncertain. The low estimate of desirable kelp is about 10,000 tons, and the maximum potential harvest is 300 tons, resulting in a potential harvest of 3% of the desirable kelp. If this harvest is concentrated in a small number of areas, as it has been in the past, users may find desirable kelp hard to locate and conflicts may occur among users. The estimate for the amount of desirable kelp needs to be improved. This can be accomplished by visiting more beds to sample more blades. It appears that the width of kelp blades does not vary at a site over the season, so a kelp bed can be evaluated at any time during the spring and early summer.

We observed few lasting effects of harvesting on kelp beds. This experiment was limited in scope and duration and should be monitored, continued, and expanded in spring of 2000. The effects of harvesting the same bed every year as well as harvesting only once need to be assessed. In addition, the effect of harvesting on the kelp bed community needs to be evaluated. Given the high growth and production rates of *Macrocystis* elsewhere (Lobban 1978a, 1978b, Coon 1982, Wheeler and Druehl 1986, Jackson 1987), it is anticipated that kelp recovery from harvesting should be completed by the end of summer for harvests in March or April.

Based upon the preliminary results of this study, there was sufficient kelp in March 1999 to support the currently proposed Sitka Sound ROK fishery assuming total harvests would be in the neighborhood of several hundred tons. Conflicts between users may occur over access to high quality kelp, but these conflicts may encourage harvesters to locate currently unused high quality beds. The effects of harvesting on kelp and associated communities appears minimal or negligible, but this needs to be verified by further research.

Open Pounds and the Traditional Subsistence Fishery

The photo below was taken during the 1998 experimental fishery. Subsistence users set their hemlock branches near the open pounds. The pounds were anchored and tied in such a way as to not impede subsistence activities from taking place. There is concern that more pounds fishing will impede the subsistence fishery but there will still be plenty of area to suit the needs of both user groups.



There are plenty of fish available to both open pounds and subsistence users. Using the 27% conversion ratio from the ADFG report, 185 tons of herring can produce around 100,000 pounds of spawn on kelp (SOK). The current amount necessary for subsistence (ANS) for the Traditional fishery is between 136,000 and 227,000 pounds. Using the same conversion for SOK and comparing to the current ANS the total amount of herring needed to meet ANS would be between 250 and 420 tons. The amount of herring required for the upper end of ANS represents less than 1% of the forecast biomass in 2015. Also, the SOK fishery would not remove additional herring from the biomass increasing opportunity for subsistence needs to be met. Put simply, there is plenty of fish and area for everyone to coexist.

Herring Spawn-on-Kelp

An Update of Market Variables Affecting Demand in Japan



Jumbo No.1 Product



Seasoned Product

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1. Executive Summary

This report provides a concise review of market and economic factors influencing the current and future demand for BC Spawn on Kelp in the Japanese market.

The world's second largest economy is undergoing 'moderate' deflation for the first time in 40 years. This was before the calamitous events of and since September 11 this year.

Key feature that will affect demand for BC Spawn on Kelp (SOK) are:

- ❖ Higher priced food products are under pressure to deliver value, quality and supply consistency
- ❖ In the face of poor economic conditions, high debt and consumer purchasing shifts, several of the major sales channel members and sectors for food products in Japan are suffering declining sales and profitability.
- ❖ Seafood consumption in Japan appears to be holding its own against dramatic increases in beef and pork sales over the past decade (at least) as Japan strives to adopt more western eating habits.
- ❖ Japan's customary gift giving seasons remain intact, but 'givers' are seeking lower priced goods and are purchasing gifts for more occasions.
- ❖ BC's SOK production remains in a market leadership position, but faces pressures to deliver more consistent quality. The US and Russia are the two countries that could significantly increase production.
- ❖ Few reproprocessors of SOK in Japan dominate the 'front end' distribution
- ❖ The total supply of SOK to Japan is relatively small and must be inventoried to permit rear round supply, resulting in limited attention to market growth in consumption.
- ❖ Price of imported SOK appears to be both a function of classical supply and demand as well as the appetite of the importers (trading companies and reproprocessors) to attain annual market share goals
- ❖ Very little if any BC or Canadian 'branding' is carried forward to the end user in Japan.

Opportunities and recommendations include:

- ❖ Japan is the market of choice for any increased BC production in future
- ❖ The market can absorb more product and if increases are modest over time, may result in minimal price declines, if any, and increased consumption across all sales channels
- ❖ Production of thinner SOK could offer an opportunity to increase sales due to higher perceived value; new production techniques may be required



- ❖ BC producers and primary processors need to improve quality consistency in concert with buyer requirements – work with the market players, they are BC's only customer!
- ❖ ROK is a relatively healthy convenience food and can be promoted as such
- ❖ A super premium quality product, fresh light brine or no brine ROK could be tested for a high end application, delivered by air freight, in-season
- ❖ The Japanese market is complex and tradition bound – don't try to outsmart the market; work with market 'partners' for a win-win strategy to increase sales and consumption, should the need arise
- ❖ Carrying forward BC/Canadian identification and possible producer 'branding' to the end-user should be investigated as both a defensive and offensive strategy
- ❖ The BC SOK industry stakeholders should consider maintaining its market leadership through supply and market expansion to avoid being beaten to the punch by Alaskan and/or Russian competitors
- ❖ Resources should be found to investigate other markets for BC SOK, as a defensive strategy.

2. Project Scope

The focus of this report is to provide an overview of the most important economic and demographic drivers of demand and consumption for seafood, and Spawn-on-Kelp (SOK) specifically, from the perspective of this consultant.

The report presents a compendium of market information to incorporate into a broader assessment of the SOK industry being proposed by E. Blewett & Associates in their assignment for Fisheries & Oceans Canada.

An extremely tight time frame permitted for this project limited the number of market and SOK production contacts and their feedback; therefore the results are presented on a best efforts basis.

Opportunities and constraints of increasing consumption of SOK are described and Conclusions and Recommendations are presented.

3. Current and Market Situation

❖ Japan Economic overview

Japan's economy has been in difficulty for some time and has just entered its fourth recession in 10 years. Japan is the world's second largest economy yet



has the unenviable record of currently having the highest public debt (which includes massive bad debts at the nation's banks) in the western industrialized world.

In March, 2001, the Government of Japan admitted a state of 'moderate' deflation of its economy, for the first time in the last 40 years.

Prior to September 11, 2001, the world's powerhouses of the US, Europe and Japan were struggling to lift out of a global meltdown. Since that time, all indicators are pointing negative.

Experts say that Japan's woes are deeply rooted; business and industry needs an overhaul, but they caution that now is not likely the time to tackle painful reforms, given the severity of the economic slump in Japan, as well as with its major trading partners.

Some significant economic indicators in Japan, relevant to this report, are:

- o Consumer prices and consumer spending has fallen for three consecutive years
- o Japan's retail industry is undergoing restructuring pressures: Mycal, Japan's 4th largest retailer, filed for bankruptcy protection in September, one of the largest corporate failures in Japan's history.
- o Job cut fears are softening consumption, particularly on high priced goods, causing an upswing in personal savings
- o Hopes for Japan's economic recovery, both broad and related to its consumers appetite for high priced goods, is closely linked to the condition of the US economy.
- o The consumer trend to a more Western diet is ongoing, particularly among the nations' young and those with higher disposable income. Many of the more traditional Japanese products (including food products), are declining.

❖ Sales channel trends

Due to the economic conditions outlined above, the retailing sector is exhibiting structural changes. Discount chains are strengthening their presence, while foreign retailers such as Costco and Carrefour are continuing their aggressive entry into the Japanese market and thus, are accelerating the severity of competition in the retailing sector.

Hardest hit have been the general merchandise sector, which includes supermarkets, which saw a 5.3% decline in total sales versus the previous year. Convenience stores are still flourishing but sales and operating profit appear to have peaked or are weakening.



In the foodservice sector, take-out lunchboxes and delis are becoming a driving force due to the changes in people's lifestyle and consistent with the savings minded Japanese consumer attitudes.

It is indicated in several industry reports (e.g. DFAIT Japan Fisheries Market Report, May 2001), weak economic conditions are seeing declining consumption at higher priced restaurants and sushi bars.

On a brighter note, there is an increasing trend to eating out dining at chains and independent restaurants specializing in 'revolving belt' sushi outlets (Nihon Shinbun Kyokai [NSK], October 21, 2001).

Japan's heritage of gift giving continues. It is customary to give gifts to business associates, colleagues, friends and family members. Some notable characteristics of gift giving in Japan are:

- ❖ Historically, the two key gift giving periods are summer season called "Ochugen" and a winter season called "Oseibo".
- ❖ Poor economic conditions have seen a decrease in terms of both the number of gifts given and their value, particularly during the winter season. Despite this trend, gift giving is still a large 'industry' (\$US 90 billion in 1999), with food products composing approximately 20% of this total.
- ❖ There is a trend to give more gifts more often (at other times of the year) and on more occasions.
- ❖ Typically, gifts are of higher quality and traditionally high image brand names have been important.
- ❖ Seasonal gifts are sold primarily through speciality wholesalers to upscale Department Stores, upscale Retail stores and speciality gift stores. Increasingly, the convenience store sector has started carrying a limited selection of gift items.

❖ Seafood consumption trends

Seafood consumption in Japan remains among the highest in the world and continues to rely heavily on imported products (\$US 16 billion), with Canada's share in 12th place (547 million, 3.4% of seafood imports).

Seafood imports by Japan will likely continue to increase in volume in future years due to declining domestic fishery and aquaculture supplies as well as high seas catches. The changing appetites of Japanese consumers for convenience foods and healthy eating can continue to be fulfilled by seafood products as producers, reprocessors and the retail/HRI sectors satisfy these demands through new product development and branding programs.



❖ Beef, pork and poultry trends

Consumption of beef, pork and poultry have increased dramatically in Japan during the past 10 years consistent with the changes in demographic makeup and an appetite for western foods. Time trends in food intake, indicate an increase in meat consumption of 13% compared to 3% in seafood consumption (1990-1997, Japan National Survey by Ministry of Health and Welfare)

The recent mad cow disease scare in Europe has spread to Japan. Short term impact is seeing a dramatic fall off in beef consumption. To date, no increase in seafood consumption has been noted (Bill Atkinson News Reports, Oct. 22, 2001)

❖ Roe-on-Kelp production & consumption trends

Production and Price trends:

- According to DFAIT/Ni-Ka Online, imports of herring Spawn-on-Kelp decreased substantially (by 32.6%) in terms of volume from 869 mt in 1999 to 586 mt in 2000. A sharp decline in imports from the United States from 329 mt in 1999 to 34 mt in 2000 was the major reason for this decrease in the total import. Reflecting the decrease in the quantity, the average import price for both Canadian and US products has recovered slightly from 1,876 yen per kg (C.I.F.) in 1999 to 2,118 yen per kg in 2000 for imports from Canada and from 1,357 yen per kg in 1999 to 2,160 yen per kg in 2000 for imports of the US.
- **Note:** there are some interpretation questions in these statistics that remain unresolved. For example, the US fishery statistics indicate production from both Alaska and San Francisco was 236 mt in 1999 and 87 mt. in 2000 (0 from Alaska). Comparing these figures to those above indicates possible carryovers in production within the US, or inaccurate import statistics. Similar analysis has not been tested in other years or for other countries production versus import statistics.
- Embassies and Fisheries Departments were contacted in countries that have prior SOK production (Finland, Iceland, Sweden, Norway, Atlantic Canada, S. Korea and Russia). Responses are as follows:
 - Atlantic Canada: Newfoundland had reserved a quota of 200 mt for 1999/2000, but reports no landings in recent years. More information may be forthcoming.
 - Russia: embassy staff report no knowledge of a fishery for this product, more information may be forthcoming, but statistics are poor, particularly for exports.



- S. Korea reports no knowledge of production
 - Finland, Iceland, Sweden and Norway have yet to respond
 - Note: time may provide insights to the lack of information, but it appears that export statistics of this product are not readily available, or perhaps non-existent due to small production quantities in these countries.
- A significant buyer of BC, Alaska and San Francisco SOK that I spoke to indicated no recent production from Iceland, Sweden, Norway or S. Korea. He did indicate, however, that:
- Finland produced 26 mt in 1999, 12 mt in 2000 and none reported to date in 2001.
 - Russia produced 42 mt in 2000 and none reported to date in 2001.
 - Russia has been encouraged to develop a fishery and has produced limited and intermittent quantities in recent years. Poor weather, ice, inadequate resources and training have impeded development of a fishery there, to date.
 - The San Francisco fishery is of limited herring biomass, so there is little likelihood of increase SOK production in future.
 - The area with the largest potential to increase production, outside of BC), is Alaska. Much of the herring roe fishery in Alaska is frozen in the round and exported to Japan and China for processing into brined roe for Japan. The prices received by herring roe harvesters in Alaska is significantly below what could be obtained if they transferred their quota to SOK. Alaskan fishery regulators would support this, but some of the existing herring permit holders are reluctant to support a conversion initiative, to date.

Consumption trends

- Due to poor economic conditions in Japan, the traditional sales channels for this product have been shifting from high-end Japanese restaurants, sushi bars and gift items to less expensive venues. In addition:
- Poorer quality product is being processed into less expensive retail packs for department store and grocery store consumption (including seasoned products) in greater quantity than the past.



- "Japanese trade people engaged in importing, distribution or processing hold that the development of the market in this direction will be the only way to increase (sales) prospects for this product in the Japanese market". (DFAIT Japan Fisheries Market Report, May 2001)

❖ Currency factors

BC Herring SOK is purchased in Canadian dollars. The value of the Japanese yen to the Canadian dollar during the time of purchase of SOK could influence the price paid in BC and the resulting selling prices in Japan (in Yen/kilo).

This consultant was not provided with BC selling prices to determine if this factor is 'in play' in price determination. However, analysis of the movement in the value of the dollar vs. the yen was tracked back to 1995 and average import prices of a number of seafood products in yen per kilo were examined:

- It appears that there is little, if any, relationship between the strength or weakness in the yen and the selling prices of a number of seafood products in the Japanese market (salted herring roe, Ikura, King Crab, Northern Shrimp).
- The highest prices in yen/kilo in Japan for SOK was in 1995; this was also the year in which the yen was strongest against the dollar, compared to subsequent years. This price effect may have resulted in higher prices paid to harvesters in BC.
- In Japan, other factors are believed to be of greater influence in determination of the end-user price:
 - supply and demand
 - market share goals of importers and reprocessors
 - quality of the annual 'pack' on average
 - 'in-market' factors such as inventory levels, disposable income, reduced demand for higher priced food products and reduced expenditures on eating out at high end restaurants

❖ Roe-on-kelp purchasing dynamics

BC SOK permit holders are restricted to an 8 ton quota. Permit holders are also required to weigh their product after brining and are given a 6% overage allowance for brine uptake.

It was reported to this consultant that a 'scandalous' practice that has gained in popularity is to obtain an official weight prior to brining, then brine the product and boost the weight. This allows the 'real' quota to be exceeded. However, to maintain maximum roe quality, the product must be brined as soon after harvest as possible. The delay in brining caused by the aforementioned practice decreases quality. It was reported that this practice is generally carried out with



the knowledge of all parties. Japanese buyers have difficulty in detecting quality deterioration due to 'sampling error' at time of inspection of sample lots.

❖ Dominance of few re-processors

Few Japanese reprocessors exist for SOK. Current information indicates that Taniya continues in a dominant position (estimated at 70%) in reprocessing and supplying to all sales channels in the Japanese market.

Despite this dominance, other reprocessors vie for market position and influence the price paid to trading companies/importers in any given year. It was reported that the major historic buyer of SOK, Taniya continues to be the major force today.

❖ Channel player health

The distribution system in Japan from raw material purchase (BC SOK) to trading company to re-processor to wholesalers and major channel players has not been simplified for this product – the health of each segment makes a difference to the operation and health of the whole.

The Japanese food retail and food services sector is both in transition and under serious price and profitability stress due to the weak Japanese economy, high debt and shifting consumer purchasing behaviour. Current reports of business failures and poor financial performance are common

Change will be the 'constant' over the near future, at least. If the sales channel members responsible for sales of SOK were to experience serious financial difficulties or were to shift their product focus, further price erosion could take place.

❖ Supply size

The supply of SOK is relatively small compared to other seafood imports and food products in Japan. This low volume characteristic results in a reluctance by channel players below and including the reprocessors to spend much time and/or marketing funds on channel expansion, regional distribution expansion or internal promotion. This relationship if further aggravated, under current economic conditions, by the positioning of SOK (BC's in particular) as a high priced/luxury product.

❖ SOK Branding

There is very little if any producer/exporter brands or country of origin labelling of SOK being carried forward to the end-user in Japan. (Note: on the cover of this



report is a photo of seasoned ROK, (Cheena brand), which shows a display window in the shape of a Canadian flag. It is not known if this product is marketed in Japan – Cheena has gift shops in Vancouver, catering to Japanese tourists).

Brands are extensively used by reprocessors, importers, food distributors and retailers in Japan that form the basis of building awareness, preference and consumer promotion activities.

4. Opportunities and Recommendations

4.1. Market Expansion: Japan or beyond?

Any market expansion strategy, in this case to expand consumption/sales, would either focus on methods to expand existing market(s) or expand current or future distribution into new markets

A marketers' primary analysis of these options would focus on cost and benefit of the alternative strategies. Typically, the cost of developing a new market(s) would be far higher, complex and time consuming (years) than an existing market.

Primary reasons to look to new markets for SOK would be due to:

- o Major impediments to market expansion in current market including economic factors (e.g. negative price elasticity which would see dramatic declines in price if supply were increased)
- o Market research that indicate probable or defined interest to purchase by buyers and/or consumers in new markets (we haven't done this research beyond a few phone calls!)

It is my recommendation to focus on the Japan market, at least in the short term, to increase the market position of BC SOK or if required, to increase consumption.

Good or bad, there is a single market 'heritage' of consumption in this market aside from limited consumption of this product in other countries by Japanese expatriates and some eating establishments and gift shops catering to tourists and 'adventurous' diners.

- o Quick investigation I did of consumption in nearby Asian countries turned up nothing (e.g. sushi bars in Korea that cater to Japanese tourists/business people do not currently offer roe-on-kelp – this despite that Korea eats many different fish roe products). Further investigation might prove this market to be of some potential, who knows!



4.2. Supply and price relationship appears to be 'economically' elastic, with limits

Information from interviews suggest that an increase in supply of uniform 'high' quality SOK from BC, if in small increments, should not see a significant decrease in prices received.

Should this be achievable, the market can be grown without negative impact on prices received by BC producers.

4.3. Supply is very small in total in a large market

Despite the current price sensitivity to higher price goods in Japan, the quantity of SOK in the Japan seafood scene barely hits the radar screen.

Some observers believe that there is plenty of room for Japan market expansion of SOK across all sales channels, including the higher priced gift and upper end restaurant/sushi bar sectors.

Further, in order to present marketing and promotion opportunities for sales channel members in Japan, increased supply would be required, particularly as year round supply is essential to retaining consumer loyalty and purchase.

4.4. Retail marketing of SOK has been limited by limited supply and price

Marketing of SOK at the retail supermarkets has been limited, mainly due to price and the margin requirements of retailers. This channel has/is being used for lower priced product and seasoned product but has hardly been touched due to high historic prices and limited supply. This channel requires consistent and substantial supply to obtain shelf space and maintain 'listing's' or 'rental space' within the store.

If an economical production method could be developed to produce SOK with thinner roe coverage, it would be possible to offer less expensive product to this major consumer sales channel.

4.5. Japan's image of Canadian food products is positive

Japanese consumers have a high regard for 'western' and Canadian products, though price and quality have become increasingly important.

In order to differentiate BC SOK, a branding opportunity is presented to identify Canadian production.



4.6. BC SOK is variable in quality

Despite quality grades set by BC processors and purchased by Japanese buyers after inspection, it was reported that quality is inconsistent within the set grade standards.

More stringent quality guidelines at time of inspection and purchase in BC could be implemented to improve quality consistency and reduce reprocessor costs of misgrades and grading in general in Japan.

4.7. Health and time-conscious consumers are increasing

Japan is tracking other western industrialized consumers in paying increasing attention to healthy foods that are easy and quick to prepare (e.g. low(er) fat and salt, microwaveable, etc.)

SOK fits the bill. It is effectively ready to eat. Brined herring roe by comparison is more time consuming to prepare and has to be soaked, washed and is typically re-seasoned prior to eating.

These features could be positively promoted.

4.8. Fresh-by-air SOK – possible?

High-end restaurants in Japan pay very high prices for the freshest products. Though I'm not aware if it has been attempted, it would be feasible to transport fresh product with little or no brine added to Japan via air cargo without suffering significant quality loss.

This would only be possible during the production season and likely for a limited quantity, but this may offer an additional 'top-end' channel to operate in (e.g. False Pass/Copper River Sockeye – the first of the season).

4.9. Don't try to outsmart this market

One might be tempted to look at expanding consumption and/or to increase price of SOK by leapfrogging the distribution system, jump in with BC producer branded product and market product directly to the highest priced sales channel.

Don't! Money down the drain.

It is my conviction that the best means to create a winning marketing strategy in a foreign land with a product like SOK, is to work with trusted 'partners' in Japan to co-devise the most sensible and cost effective marketing strategy. The plan



must be win-win for all parties if it is to succeed and may indeed require some adjusting on the production and fishery management side in BC as well.

4.10. Beat 'em to the punch – keep BC's market leadership

BC is the market leader of SOK in Japan.

BC has seen eroding market share of its once leading 'wild' seafood products. SOK is an interesting product as a wild resource is utilized to produce finished product attributes that can be controlled and manipulated similar to true aquaculture practices.

It was described to me that both Alaska and Russia have the potential to increase production of SOK, given adequate resources and dedication. This may be a 'soft' challenge. If BC doesn't rise to the challenge, someone else may facilitate the growth of our competitors.



ROK Marketing Questions and Answers

There have been market studies for roe on kelp (ROK) but the studies were completed over a decade ago. The market conditions surrounding herring roe products, both sac roe and ROK, have not changed much since these reports were written. In order to provide updated information a longtime broker of herring roe products was contacted. The following are questions and answers from the discussion:

How much of a market would be available for this “new” ROK product?

In 2004, there was an abundant supply of ROK coming out of BC/SE AK. I think in 2005 it was around 800 ton total supply. That volume was a real challenge for both seller and buyer. The sales prices were quite low and allowed for entry into new consumption markets. ROK became something that was accessible at pubs and such places versus something that was so expensive as to be served only at weddings and high end sushi bars.

New consumption channels arose and the 800 tons of supply did not appear so daunting as indeed the carryover inventory the following year was not as severe due to increased consumption.

The advantage ROK has over Herring Roe is that the image of ROK is not as heavily wedded to New Year’s season consumption. As well, the combination of kelp with herring roe seems to be more appealing to some consumers than herring roe by itself. I seem to notice more sushi menus offering ROK in a visible manner versus herring roe.

Also, the supply of ROK is much smaller than Herring Roe. The Herring Roe market is sometimes said to be around 10,000mt. The supply of ROK tends to be in the 300mt to 500mt range. Total supply is much less than Herring Roe and increasing the supply of ROK, in terms of overall supply, is a much smaller number and should be easier to deal with - especially if we are talking about ROK being a staple of the sushi market which is a very robust and successful market in Japan.

The sushi market utilizes the thinner coverage production. The sushi restaurant market in Japan is thriving. (4,010 sushi restaurants in 2014)

The one thing I would caution is, the market for raw materials to use as sushi toppings is relatively deep - but it is price sensitive.

To come back to your question, I think there is market space for additional ROK product but it will be price sensitive in the short term. I would think that as the popularity and demand for ROK increases, gradual price increases are possible as long as supply does not have the wild swings that we have seen in the past.

The large harvest of 2005 then reduced harvests in 2006 and 2007 whereby in those two successive years the price doubled each year but the market shrank to match the available supply.

Would the additional product produced in Sitka be a detriment or complement to the products currently produced in SE roe herring fisheries?



Anything that decreases the availability of sac roe going to the Japanese market would be positive for the market. Allocating available resources from sac roe to ROK should be a net benefit. We are currently going through a period of suffocating oversupply on the sac roe side. This year's ROK supply was also quite abundant, being at least double of the year previous and this has had a deleterious impact on pricing but as mentioned previously the overall volume of ROK is much different than herring roe and poses different and I would say less daunting challenges. Let's remember that the supply of ROK really only comes from BC and SE AK whereas herring roe comes from more sources and in greater volumes. (Let's not forget herring roe also comes from Atlantic Ocean sources)

Thus, even though we had a sudden surge in ROK production this season that was over double of last season's harvest the volume is still manageable with the market taking a longer term view on consumption such as 18 months versus 12 months. Once again, the scale of volume we are talking about is much different for ROK versus Herring Roe. (2014 estimated harvest: Herring Roe – 8,400mt / ROK – 600mt)

What is the long term outlook for sac roe and ROK products?

The long term outlook for herring roe is stable consumption with we would hope growth due to the available supply of herring roe. Recent history would suggest that we will not see explosive growth in herring roe consumption. Closed Pound ROK or Open Pound ROK will likely be viewed the same in the market and would be compared by current quality attributes which assign value.

Is it safe to assume that if the sac roe price increases then the egg on kelp market would also see a corresponding increase?

Although they are different products per se, there is a linkage between the pricing of herring roe and ROK since they are similar products. This year would have been a good test case to see what kind of price differential would be possible had the harvest of ROK been limited. But, it is generally thought that the pricing of the two products cannot be vastly different.

Will adding ROK in Sitka will not be a detriment to already existing ROK fisheries in SEAK.

The history of ROK pricing may make this difficult. Because the ROK market is small in terms of volume and buyers, the price is quite sensitive to volume when the volumes are limited. The past 10 years have seen some volume swings and foreign exchange movements that have led to a wide range of pricing for SE AK ROK. The current context of high volume and the comparative weakness in the yen will make it hard to take the position that additional ROK from Sitka will not soften the market further. (although it looks like there are resource issues in Hoonah, Ernest Sound and Tenakee which may make SE AK ROK a scarce commodity even with a Sitka ROK fishery)

The market will not be taken away. There is room for market expansion, although the near term impact may be lower pricing until the market adjusts to the increased volume.



JAN-15-2008 16:50

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TO WHOM IT MAY CONCERN

Subject: Sitka Sound Roe Herring Open Pound Fishery

I have been invited to provide testimony on the subject of SOK production in Sitka Sound. I would consider it a privilege. It is my sincere hope that the views expressed here may promote healthy discussion and perhaps, lead to the adaptation of policies which will benefit all in the industry.

I have been involved with SOK for the past 20 years. During those 20 years, my company has gained valuable knowledge and experience into the workings of the SOK market. In 1999, we purchased 260 tons of SOK from California, B.C., and southeast Alaska, including Sitka.

It is my understanding that if the full potential of roe herring is utilized, Sitka may one day become the leading SOK-producing region of the world. I have heard concerns expressed that such increase in supply would disturb the delicate balance of supply-and-demand and produce a negative impact on the already fragile market, and bring hardship to the existing permit holders of SOK. These are legitimate concerns and one must not take them lightly.

However, I am of the opinion that, reducing the supply to keep the price up can work only under certain market conditions - but not now. In the present market climate, it will only mean repeating the same mistake that already has led the SOK industry to its current predicament.

To explain further, first let us examine the reasons for the current downturn in the SOK market. In my opinion, the present difficulty is in large part due to reaction to excessively high prices of the past.



To elaborate on this point, I have attached two graphs following.

The dollar values used are the mean average prices for closed pound SOK from B.C. They show a dramatic price increase that peaked in 1995, only to be followed by an equally precipitous price drop, which continued unabated to 1999. The expression, "Where the mountain is high, the valley is deep", encapsulates the essential behavior of the SOK market.

Graph 1 shows the combined supply of SOK from all the North American production areas. Here the rising prices up to 1995 seem to correspond with decreasing supply. In the same token the declining price curve from 1996 coincides with increasing supply for that period. Here, a superficial examiner of this graph may jump to a hasty conclusion that this is the evidence of increased supply driving down the prices. However, he must be cautioned not to be so hasty.

Graph 2 shows same price curves. However, it is different from Graph 1 in that it shows only the closed pound production from B.C. and southeast Alaska. Here the supply of thick product was fairly consistent through the same period of great price upheaval. Granted, there was a sizable supply increase in 1997. However, during the years that followed the declining price curve continued despite supply reached a plateau. It is reasonable to conclude, then, that it was not the over-supply that affected the price of SOK, but some other factors were at work.

The single most important factor that has been driving the price down, in my opinion, is the economic recession in Japan. During the bubble economy years that lasted until early 1990's, Japanese consumers displayed great appetite for luxury. Consumption of expensive foods, including SOK, rose to record levels, and as those commodities became objects of speculation, the prices soared. But as the bubble burst, realities of economic recession set in, and the consumers backed off.

Take for example the kazunoko (herring roe) market. Despite the fact that the 1999 supply of kazunoko was the lowest in twenty years at less than 10,000 tons, the year-end gift kazunoko market plummeted. Conversely, lower-priced kazunoko in the form of consumer pack fared relatively well. Total consumption appeared to have been at par with supply.



The same situation manifested itself with SOK. Movement of thick SOK (jumbo & No.1 from B.C. and Alaska) was extremely sluggish, and the prices were down to record low levels. Thinner product, on the other hand, sold well, because prices were low enough to appeal to consumers.

These examples show that the market is constantly evolving, and that how important it is to stay in tune with the consumers' needs.

There are four main ingredients to successful marketing. They are:

- Healthy demand
- Consistent supply
- Reasonable price
- High quality

Of these, a healthy demand has to be ranked as the highest importance. If the high prices of recent years have alienated the consumers away, what the SOK industry must accomplish now is to find way to recapture the lost customers and generate new demand. Aside from making the product more appealing in terms of both price and presentation, the key is to make SOK accessible to a greater number of consumers. The task of generating demand is not a difficult as it may seem. For SOK possesses inherently superior product appeal. For instance, nine of ten people who actually tasted SOK will show a decided preference for SOK over kazunoko. This is an evidence enough that there is a huge potential for an untapped consumer market for SOK.

However, the size of the market can only be as big or small as the volume of supply. In this sense, the very limited supply that gave SOK the exclusivity in niche market is a fundamental weakness that prevent it from acquiring wide popularity. This point is clearer when one compares the supply of SOK against herring roe. In 1999, the total supply of herring roe was 10,000 tons, while SOK was just over 500 tons, barely 1/20th of kazunoko. This means that only a very few consumers had ever tasted SOK. Indeed, the majority of Japanese are even aware of its existence. The solution, then, seems to be to increase supply, while maintaining reasonable price and quality.



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To this end, proposed alternative harvesting in the form of SOK in Sitka can make a significant contribution, especially if the open pound method is used. In the market where thick product by closed pounds dominates, thinner product by open pound will provide just enough diversity. It is possible that, instead of competing, producers of open pound and closed pound SOK can complement each other. By having the ability to offer rich variety of product, the SOK industry collectively will enjoy a greater chance of success in the task of opening wider market, and cultivating the greater demand in the process.

In conclusion, I believe that, if managed properly, open pound SOK fishery in Sitka Sound offers a promising alternative for better utilization of available resources. Even though critics may have legitimate reasons to worry about the over supply, benefits far outweigh the detriments. Perhaps, in consideration to existing permit holders the initial quotas should be set at a moderate level, but with mechanism to increase gradually as more demand is generated.

Thank you for the opportunity to voice my opinion. It is my sincere hope that the new management plan for SOK in Sitka Sound will be formulated with the greatest care for the future benefit of all.

Respectfully yours,

A handwritten signature in black ink, appearing to read "Ed Furumori".

Ed Furumori



Southeast Alaska Fishermen's



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December 27, 2017

Alaska Board of Fisheries

John Jensen, Chair

PO Box 115526

Juneau, AK 99801

RE: 2018 Southeast Shellfish, Groundfish, and Finfish Proposals

Dear Board of Fish Members,

Southeast Alaska Fishermen's Alliance (SEAFA) represents our 300 + members involved in the salmon, crab, shrimp and longline fisheries of Southeast Alaska. Prior to submitting our comments, we sent out an online survey to our members regarding several of the shellfish proposals and encouraged that they share the survey with non-members to help develop our positions on the proposals. Our comments on individual proposals are presented in numerical order by fishery for convenience.

DUNGENESS CRAB

Proposal #53: No position at this time, additional information needed

This is a proposal submitted by ADF&G to clarify regulations related to the sale of buoy tags for the commercial crab fisheries in Southeast Alaska. We have concerns about unintentional enforcement issues arising from these changes. We are in the process of setting up an evening meeting (hopefully the first night) during the Board of Fish meeting to discuss this proposal with the Department and enforcement issues regarding buoy tags. The Dungeness crab buoy tags were originally issued to the vessel because of the tiered permit system and the ability to stack several permits up to 300 pots maximum. *As the intent of this proposal is to try and align the regulation with current practices, we would suggest that 5 AAC 32.126(b) be additionally amended to read:*



(excerpted for relevance)

HERRING

We are not commenting on specific herring proposals. We would like to comment on the action taken at the work-session on non-regulatory proposals. The Board decided to write a letter to CFEC to allow open herring pounding by Sitka sac roe herring seine permit holders in Sitka Sound. This issue was agreed to be discussed during the SE finfish meeting. We oppose writing another letter to CFEC as it is unnecessary. At the last SE Board of Fish cycle. the Board wrote a letter requesting CFEC to hold a hearing on this issue. CFEC started the process by determining that there is a limited entry permit that authorizes herring pound fishing in the Sitka Sound area. Following that information, they held a hearing to determine if the Sitka Sound area was appropriately designated in the Northern SE pound permit. After the hearing, CFEC determined that the area designation was correct to have Sitka Sound as part of the Northern SE pound permit. That determination ends the discussion. The only way for an open pound herring fishery to come to fruition is for a portion of the Sitka Sound herring sac roe allocation to be shared with the Northern SE pound fishery. *To be clear, SEAFA is not advocating for that option, we are just stating what the path is.*



forward to an opportunity to participate in the committee of the whole for the salmon, crab, shrimp and groundfish species for which we represent our membership.

Sincerely,

A handwritten signature in black ink that reads "Kathy Hansen" followed by a long horizontal line.

Kathy Hansen
Executive Director