

Considerations for Rationalizing the Trawl Groundfish Fisheries in the Central Gulf of Alaska

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I. Introduction

This paper is focused on the trawl groundfish fisheries in the Central Gulf of Alaska. It discusses issues that are essential to rationalizing these fisheries while achieving three specific goals. Those specific goals are:

- Protect investments in the fishery made by both owners of processing plants and harvesting vessels, but do not create a windfall for either sector.
- Incentivize the avoidance of Prohibited Species Catch (PSC), in particular, the bycatch of Chinook salmon and halibut.
- Promote economic growth in Kodiak, while protecting community stability and the social values associated with both a healthy fishing industry and a working waterfront.

At its October 2012 meeting, the North Pacific Fishery Management Council adopted a “Purpose and Need” statement indicating its intention to consider rationalization of the trawl groundfish fisheries in the Central Gulf of Alaska.¹ The Council’s motion expressly defined the action’s purpose as the creation of a new management structure “which allocates allowable harvest to individuals, cooperatives, or other entities, which will eliminate the derby-style race for fish.” The trawl fleets’ lack of tools in a derby fishery to avoid bycatch was the primary concern expressed by many Council members. The Council’s motion also mentioned the goals of improving stock conservation, eliminating

¹ Council Motion — GOA Trawl PSC Tools, Oct. 9, 2012. The Council’s motion was amended at its February meeting to focus on incentives to avoid bycatch. The amended motion still notes that: “The purpose of the proposed action is to create a new management structure which allocates allowable harvest to individuals, cooperatives, or other entities, which will mitigate the impacts of a derby-style race for fish. It is expected to improve stock conservation by creating vessel-level and/or cooperative-level incentives to eliminate wasteful fishing practices, provide mechanisms to control and reduce bycatch, and create accountability measures when utilizing PSC, target, and secondary species. It will also have the added benefit of reducing the incentive to fish during unsafe conditions and improving operational efficiencies.”

wasteful fishing practices, creating accountability measures, and improving safety at sea. The focus of the Council's motion, however, is to incentivize bycatch avoidance.

It is widely understood that open access fisheries underperform rationalized fisheries in every relevant criterion by which performance can be measured. These include: conservation of the resource, efficient bycatch avoidance, safety at sea, gross value of products produced from the resource, and the cost of harvesting and processing the resource. Open access fisheries systematically destroy the ability of society to collect net benefits from the fisheries.

This dissipation of benefits in open access fisheries occurs because uncontrolled entry into the fishery results in overcapitalization. A simple example of overcapitalization is as follows: Imagine a fishery that is fished at the maximum sustainable yield, and produces a million dollars worth of fish per year with the services of five boats, at a total cost per boat of one hundred thousand dollars per year per boat. This results in a private and societal profit of five hundred thousand dollars per year. In this case each boat is earning one hundred thousand dollars of revenue above its total cost which includes a return on invested capital. These excess profits (rent) induce entry into the fishery despite the fact that the new capital investments do not add anything to the total catch. Entry continues until all the rent is dissipated. This occurs when the fishery contains ten boats for a total cost that exactly equals the value of the catch. If the price of fish doubled this would attract ten additional boats. The open access fishery thus squanders whatever societal benefits a fishery is otherwise biologically and technically capable of providing. If the cost of managing the fishery is not totally borne by the industry, then any fishery managed under open access becomes a net cost to society.

The purpose of this paper is to draw upon the experience gained over the past twenty-five years to highlight how the Central Gulf of Alaska trawl fisheries can be rationalized such that these fisheries can become a net benefit to society as a whole, while achieving the goals outlined in the first paragraph of this introduction.

II. Background

1. *Does it matter who receives allocations in rationalization programs?*

The benefits attributed to rationalized fisheries occur regardless of whom receives allocations of the privilege to utilize the fish. Furthermore, rationalized fisheries will be used by the same participants regardless of who receives allocations of quota. These propositions stem from the famous "Coase Theorem."² From the standpoint of efficient

² Coase, Ronald, *The Problem of Social Cost*, Journal of Law and Economics (University of Chicago Press) 3 (October 1960):1-44. Before Coase, economists of all political persuasions had accepted the idea that if, say, a cattle rancher's cows destroy his neighboring farmer's crops, the government should stop the rancher from letting his cattle roam free. Otherwise, believed economists, the cattle would continue to destroy crops because the rancher would have no incentive to stop them. Coase used a picturesque example to explain why that belief was incorrect. To summarize, imagine a cattle rancher who lives next to a grain farmer, and occasionally the cattle of the rancher invade the grain fields and damage the grain of the farmer. Does it make

utilization of the resource, it is unimportant who receives allocations of quota. When a vessel owner or processor claims to need an allocation of quota to remain in business, that claim is incorrect. Whether or not a plant owner or vessel owner ultimately receives allocations of quota does not determine whether it remains in the fishery. No matter whether initial allocations are granted exclusively to the owners of harvesting vessels, the owners of processing plants, fishermen (i.e., “crew”), processor workers, or taxi cab drivers in Anchorage, Alaska, the rationalized fisheries will be utilized by the most efficient industry participants. The less efficient entities will leave the fishery after rationalization, even if they receive allocations of quota.

As an example, the Bering Sea crab harvesting fleet shrunk from approximately 240 vessels pre-rationalization to sixty or so after rationalization, despite most all vessel owners’ sincere intentions to remain in the fisheries after they were rationalized. As another example, the pollock Community Development Quota (CDQ) program allocates ten percent of the Bering Sea pollock Total Allowable Catch (TAC) to villages in Western Alaska. When the CDQ program was initially implemented in 1991, the CDQ communities had no involvement in the pollock industry whatsoever. The pollock resource was already being completely, but inefficiently, utilized by the existing industry. The pollock quota allocated to CDQ communities was simply leased by those communities to companies already involved in the pollock fishery. It was very similar to an auction, as the CDQ communities generally leased their pollock quotas to the highest bidder. Because the fishery was rationalized—albeit into the hands of entities that were complete outsiders to the fishery—the harvesting and processing of CDQ pollock was as efficient as if the a pollock company itself owned the quota.

This point cannot be overemphasized: From the standpoint of both the utilization of the resource and economic efficiency, it does not matter who receives allocations of quota.

any difference in the number of cattle maintained and the amount of grain grown, whether the cattle rancher is responsible for the damage to the grain or the grain farmer responsible? Coase answered “no” and asked what would happen if both the grain farm and the cattle ranch are owned by the same person? That single owner should combine the two operations to achieve the largest profit. If adding another head of cattle raises cattle profits by \$100 but lowers grain profits by \$120, he will not add that head of cattle. Similarly, he will decide on building a fence only if the savings over the years fully compensate for the cost of the fence. But separate owners of the grain farm and the cattle ranch can achieve exactly this same best solution by contract, and they will be led to do so because then they will then have a larger pie to divide. The example concludes with the proposition that the *assignment of legal liability for the grain damage will determine who pays whom, but it will not affect the best way to conduct grain farming or cattle ranching.*

Coase’s insight was stunning. It meant that the case for government intervention was far weaker than economists had previously thought. The Coase Theorem has important implications for regulatory policy in general. It gave rise to the field called “law and economics” and resulted in Ronald Coase receiving the Nobel Prize in 1991.

2. *Why not auction the privilege to utilize fishery resources?*

If allocations of the privilege to utilize fish are unimportant in determining who within the industry utilizes those fish, why not just auction the privilege to the highest bidder? At first blush, there appear to be good reasons to do so. Our nation's fishery resources belong to the general public.³ It would be very simple to allocate all the benefits of rationalized fisheries to the general public through an auction of quota. The federal treasury can certainly use the revenue. If auctioned by the federal government, the fisheries will be utilized just as efficiently as if the privileges were instead allocated directly to industry participants.

Looked at another way, if a large unexploited stock of cod were suddenly discovered off a remote U.S.-owned island in the Pacific ocean, for example, and fishery managers wanted to rationalize it prior to the resource being exploited, the federal government would likely auction the privileges to this undeveloped resource rather than allocate the privileges to utilize the fishery to processing plant owners or fishing vessel owners based in Alaska, Washington State or Oregon.

The typical progression of fisheries, however, is that we tend to wait until a fishery is overcapitalized through the uncontrolled entry process inherent in an open access fishery before attempting to rationalize the fishery. The fact that we tend to wait until a fishery is overcapitalized complicates the initial allocation process enormously.

3. *The reason to include fishing vessel owners and processing plant owners in rationalized fisheries.*

In a fully capitalized, open-access fishery, where the harvest is controlled by a single quota (TAC) that the participants race to exploit, the investments in fishing vessels and processing plants that are specific to the fishery being rationalized (and that are also relatively durable and non-malleable) will be lost as a result of rationalization. This lost investment value reappears in the value of the quota. Wealth is unavoidably transferred from the fixed capital of processing plants and fishing vessels to the holders of quota.⁴ In other words, after an open access fishery is rationalized, fishing vessels and processing plants subject to rationalization have little value, potentially even negative value, especially in Alaska where these assets may have no other productive uses.

³ The United States claims sovereign rights over all fish within the United States Exclusive Economic Zone. 16 U.S.C §1853a.

⁴ Plesha, Joseph T., and Riley, Christopher C., *The Allocation of Individual Transferable Quotas to Investors in the Seafood Industry of the North Pacific* (Jan. 1992). (Attachment One.) See also, Matulich, S.C., Mittelhammer, and Reberte, *Toward a More Complete Model of Individual Transferrable Fishing Quotas: Implications of Incorporating the Processing Sector*, *Journal of Environmental Economics and Management* 31,1 (1996): 112-28.

When such fisheries are rationalized, owners of fishing vessels and processing plants can suffer enormous financial losses. The amount of the loss depends upon three factors: (1) The extent the fishery is overcapitalized; (2) the durability (or how long it lasts with routine maintenance) of the physical capital in harvesting and processing; and (3) the degree to which the capital is non-malleable (or has no alternative uses of near or equal financial benefit to the owner).

4. *How do these post-rationalization losses to the value of vessels and plants occur?*

The mechanism at work that causes investors in fishing and processing capacity to lose the value of their capital investments is that, by definition, the overcapitalized fishery has much more capital, and hence daily harvesting and processing capacity, than is necessary to prosecute the fishery once it is rationalized. A quota holder would not need to own a boat or a processing plant in order to participate in a fishery. When a quota holder decides to participate in the fishery, he or she could simply hold a reverse auction⁵ among fishing vessel owners. The vessel owners would bid down to the point where the winning boat just covered its variable costs. The quota holders would then proceed to secure processing services with the same result. The winning bid for processing services would cover only the variable costs⁶ of production.

As long as the price under discussion between vessel and plant owners allows for any return above variable costs, processing and vessel owning companies have an incentive to make a more competitive offer until they cover only their variable costs of operation and make no return on their capital investments.

This is a difficult concept for many to appreciate. Why would any rational businessman invest tens or hundreds of millions of dollars into an industry and later allow others to make use of that investment for free? When an overcapitalized, open access fishery is rationalized there is far more harvesting and processing capital than is necessary. Instead of the fishery lasting, for example, one month in an open access race, under rationalization it can be efficiently utilized in six months; meaning there is six times more existing harvesting and processing capacity than necessary. Not all of this physical capital can remain busy during the newly lengthened six-month fishery, but its owners will all have an incentive to keep the physical capital operating throughout this period. If this millions of dollars of excess physical capital earns one penny above the variable costs of its operation, its owner is better off than under the alternative of earning nothing. Thus starved for production through their facilities, vessel and plant owners bid for product until the price reaches a level at which they no longer can cover their variable cost.

⁵ In a reverse auction, the sellers compete to obtain business from the buyer and prices will typically decrease as the sellers undercut each other.

⁶ Variable costs are those expenses that increase with production. For processors, variable costs would include expenses such as direct processing labor, packaging, and increased utility charges. For vessel owners, variable costs would include things like fuel.

The holders of quota thereby will effectively own not only the fish in the fishery, but also the usufructuary⁷ rights to all the non-malleable physical capital used to harvest and process those fish. This situation, where the quota holders enjoy free-of-charge use of physical capital, continues until the capital stock wears out to the point where only the appropriate amount remains.

Immediately upon beginning operations under a rationalized fishery, therefore, owners of fishery-related capital will see the return on their investment fall to zero. This cannot be avoided and is, in fact, *absolutely necessary* in order to decapitalize an overcapitalized industry. The owners of this physical capital cannot expect to realize any return on their investment until the excess capital stock leaves the industry to the point where it is at the optimal level for the rationalized fishery.

In industrial fisheries such as the groundfish fisheries off Alaska, the financial losses described above are suffered by *owners* of fishing vessels and processing plants. Virtually every vessel and plant owner is a corporation; an entity invented by lawyers with the purpose of accumulating and investing capital for the financial benefit of its shareholders.⁸ These corporations are not “fishermen.” The corporate owners of fishing vessels and processing plants do not themselves fish or process. These corporations are not crew aboard fishing vessels or workers in processing plants. They do not own Commercial Fisheries Entry Commission’s licenses. These corporations are the owners of the physical capital involved in harvesting and processing fish.

The allocation of quota to vessel and plant owners in industrial, fully capitalized open access fisheries is essential to compensate those owners for the losses they unavoidably suffer in the value of their vessels and plants as a result of rationalization.

Some vessel owners may lament the fact that processing plant owners seek to be part of rationalized fisheries, but the rationale for including processing plant owners in the allocation of quota is also the *only* rationale for including vessel owners in the allocation of quota. If a corporation that owns a fishing vessel does not suffer losses in the value of its boat as a result of rationalization, there is no rational basis upon which it can be allocated quota.

5. *Allocations to fishermen and processors.*

In industrial fisheries the question of whether those who work as fishermen or processors should also receive allocations is, from an economic perspective, the same as whether investors in vessels and processing plants should receive allocations. Do those who work in plants or on boats have “human capital” that is devalued by rationalization?

⁷ A usufructuary right is the right of enjoyment, enabling a holder of the right to derive profit from property which is owned by another person.

⁸ Micklethwait, John and Wooldridge, Adrian, *The Company: A Short History of a Revolutionary Idea* (New York, Modern Library, 2003).

Human capital is a specialized skill that is unique to a specific profession earning the individual far more than that person could make in another available occupation. An example of those with substantial human capital would be major league baseball players. Felix Hernandez, a gifted pitcher for the Seattle Mariners, would certainly not be receiving a salary of *\$25 million a year* if the rules of Major League Baseball had been somehow changed so that all batters hit off of a tee, like a six-year old's "tee ball" game.

Those individuals who work in processing plants are paid at levels that would not indicate they have human capital that is devalued should their existing job disappear through rationalization. It is not as clear with those who work aboard fishing vessels. Fishermen, especially skippers, may have specialized skills that earn them more than the next best alternative. Such skills might include: safely operating and maintaining a boat, staying awake long hours, locating schools of fish, or managing a crew. It is not clear how difficult these skills are to find, but they are not particularly unique. Most of these skills would be required of fishermen after rationalization and these skills are indeed transferable to other occupations. On the surface it does not appear fishermen have obvious human capital that would be devalued by rationalization. Rationalization will result in consolidation of the fishing fleet, however, it is not clear that the total weeks worked in fishing and processing by the labor force will decrease at all. The peak number of people working will certainly decrease but the average time worked per worker will increase. Despite this, we believe that it might be worthwhile for the Council to consider whether fishermen have human capital that should also receive compensation for the impacts that rationalization will have for them.

6. *Allocations to the community of Kodiak.*

The community of Kodiak has seven plants that process trawl-caught groundfish. In addition, some of the trawl groundfish harvesting fleet is based in Kodiak and therefore uses support services located in Kodiak and hires crew from Kodiak.

The community of Kodiak has made non-malleable, durable capital investments in the existing race-for-fish that characterizes the open access trawl groundfish fisheries. These investments might include things such as excess electricity generation and increased water capacity for the peak processing periods.

Basically, the rationalization of the trawl groundfish fisheries in the Central Gulf of Alaska will cause the harvesting season to lengthen substantially and result in consolidation of the harvesting and processing sectors that participate in these fisheries.

Kodiak will be impacted in various ways by rationalization. Some impacts will undoubtedly be positive. If, for example, rationalization allows for groundfish to be processed throughout the year instead of during intensive peak periods, resident process workers will be able to work for longer periods and the use of non-resident labor should sharply decrease. But non-malleable capital investments made to handle the peak production seasons will become worthless and if there is significant consolidation, there could be fewer jobs for residents in vessel crewing and support service sectors.

III. Central Gulf of Alaska Trawl Groundfish Fisheries

1. *The Central Gulf of Alaska trawl groundfish resources.*

The Gulf of Alaska trawl fisheries are characterized by relatively small TACs for the primary species and extreme overcapitalization in the utilization of those species. The level of overcapitalization in the harvesting and processing sectors is on par with the halibut and Bering Sea crab fisheries prior to rationalization.

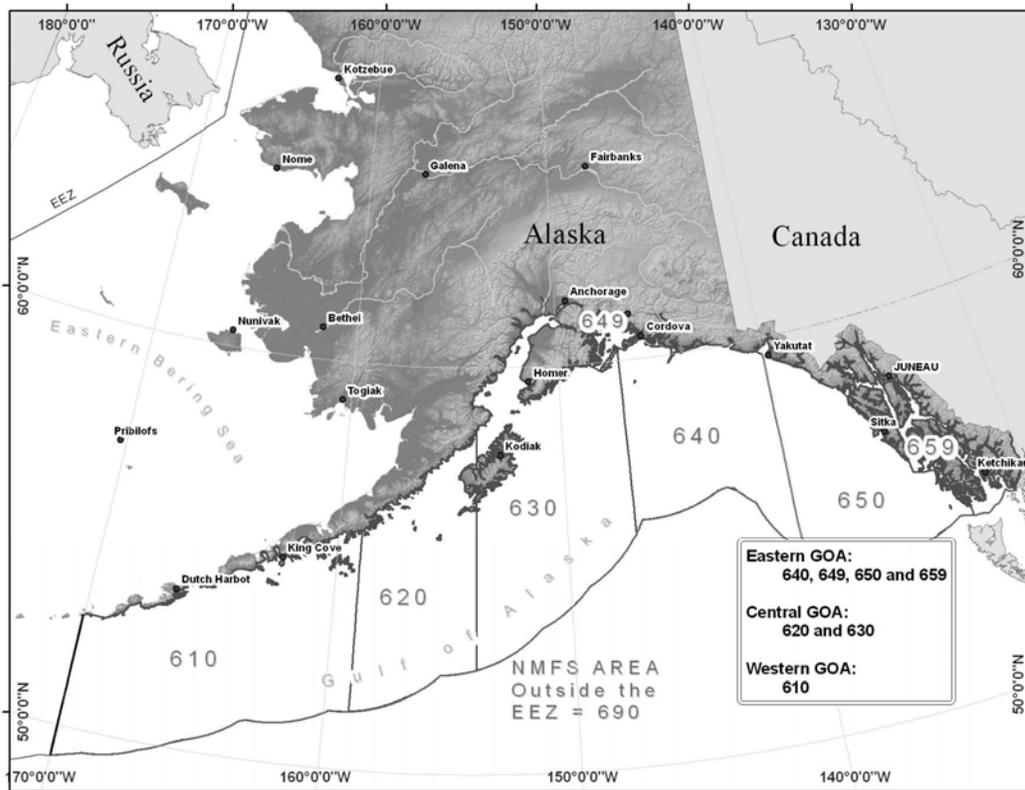


Figure 1. Federal Management Fishery Areas in the Gulf of Alaska

a. Pollock

The largest trawl fishery in the Central Gulf is pollock. Kodiak processes virtually all of the area 630 trawl pollock harvest and historically processes ninety-five percent or more of the area 620 harvest. On average, the annual harvest has been just over 45,000 MT. (See fig. 2, below.)

Pollock TAC in the GOA			
	610	620	630
2008	17,602	19,181	13,640
2009	15,249	14,098	11,058
2010	26,256	28,095	19,118
2011	27,031	37,365	20,235
2012	30,270	45,808	26,348
5-year Ave.=	23,282	28,909	18,080
Delivered to			
Kodiak =	0	27,464	18,080
Ave. Del.			
to Kodiak =			45,544

Figure 2. Average Pollock Harvest Delivered to Kodiak

Directed fishing for pollock is divided into four quarters with twenty-five percent of the total Gulf-wide pollock TAC allocated to each of the four “seasons”:

- “A” season begins January 20th, until the quota is taken;
- “B” begins on March 10th;
- “C” season begins August 25th; and
- “D” season on October 1st.

Pollock trawl fishing in the Gulf of Alaska is closed after November 1st. Allocations to management areas 610, 620 and 630 are based on the seasonal biomass distribution as estimated by groundfish surveys.

The pollock fishery is short and intensive. There is a voluntary catch share program that effectively lengthens the season somewhat.⁹ Without such a voluntary system, however,

⁹ Federal and state antitrust laws apply to the fishing industry, including fishing vessel owners. Agreements between vessel owners to limit production or allocate harvest market shares are *per se* violations of the Sherman Act. (United States v. Topco Associates, Inc., 405 U.S. 596 [1972].) *Per se* violations of antitrust laws are illegal even if such activities are otherwise reasonable, well intended, or even encouraged by government regulators. It is a violation of the Sherman Act, therefore, for private parties to allocate harvests among individual vessels, regardless of whether the National Marine Fisheries Service supports such behavior and would otherwise not open the fishery for fear that the TAC will be exceeded.

A formal agreement between each vessel owner is not necessary to show an antitrust violation. A conspiracy among competitors can be proven even if there is no formal agreement, but merely a tacit understanding.

each of the four pollock harvest seasons in the Central Gulf fishery last only a few days. Taken as a whole, the “A,” “B,” “C” and “D” pollock seasons would remain open a month or less, but for the voluntary catch share program.

Kodiak was the first Alaska community to process pollock harvested in the Gulf of Alaska through the Alaska Fisheries Development Foundation’s surimi project in 1984. At that time, the pollock fishery lasted year-round and pollock was efficiently utilized in all but post-spawn periods during portions of April and May.¹⁰ Because the Central Gulf pollock fishery is currently utilized in a month or less and it can be efficiently utilized for approximately eight months (from January 20th through October 31st, when the fishery is closed by regulation, and except for the post-spawn periods of April and May), there is about eight times more harvesting and processing capacity in the open access fishery than would be necessary if the Central Gulf of Alaska fishery were rationalized. The level of overcapitalization in the Central Gulf of Alaska pollock fishery appears greater than that of the Bering Sea crab fisheries prior to rationalization of the crab fisheries in 2005.

b. Pacific Cod

The Pacific cod fishery is another large and valuable trawl groundfish fishery. The five-year historical average cod TAC harvested in the Central¹¹ Gulf of Alaska is about 36,000 MT. (See fig. 3, below.)

The Supreme Court has held “[w]here the circumstances are such as to warrant a jury in finding that the conspirators had a unity of purpose or a common design and understanding, or a meeting of minds in an unlawful arrangement, the conclusion that a conspiracy is established is justified.” (American Tobacco Co. v. U.S., 328 U.S. 781, 810 [1946].)

The Fishermen’s Collective Marketing Act (FCMA) [15 U.S.C. § 522] provides a limited exemption to the antitrust laws. The FCMA allows fishing vessel owners, who are members of an eligible association, to allocating harvesting market shares among members of the association. This FCMA exemption, however, is strictly limited to members of the association. (United States v. Borden Co., 308 U.S. 188 [1939]. See also, the settlement in United States v. All Coast Fishermen’s Marketing Association, Fed. Reg. Vol. 47, No. 146 at 32814, where the defendant FCMA cooperative engaged with non-members in the negotiation of fish prices. The government specifically alleged “non-members attended meetings of the defendant at which the price per pound of seafood to be offered processors [the ex-vessel price] was discussed.” Further, “during periods when the members were refusing to fish because the defendant was not able to obtain an agreement with processors on ex-vessel prices, employees of the defendant secured agreements from non-members not to fish until the defendant had reached an agreement on ex-vessel prices with the processors.”)

Not every trawl vessel owner eligible to fish in the Gulf of Alaska is a member of an FCMA coop. Those who are not members of FCMA cooperatives cannot participate in voluntary catch share programs without violating the antitrust laws. Members of FCMA cooperatives can be prosecuted for encouraging non-members to participate.

¹⁰ Co-author of this paper, Chris Riley, was responsible for implementing the AFDF shorebased pollock project in 1984. Mr. Riley noted that they voluntarily stopped processing pollock in Kodiak during portions of April and May because of the post-spawn condition of the fish. Otherwise, the pollock fishery in the Central Gulf of Alaska was a year-round fishery.

¹¹ The Central Gulf of Alaska includes areas 630 and 620.

Pacific Cod TAC in GOA		
	Western	Central
2008	25,932	37,901
2009	16,175	23,641
2010	20,764	36,782
2011	22,785	40,362
2012	21,024	42,705
5-year Ave.=	21,336	36,278

Figure 3. Average CGOA Pacific Cod Harvest

The Gulf of Alaska cod resource is currently allocated among the various harvesting sectors. The trawl catcher vessel sector’s allocation is 41.6 percent of the non-jig TAC. The average Central Gulf Pacific cod allocated to the trawl catcher vessel fleet is therefore around 15,000 MT.¹²

The trawl cod fishery has two seasons, the “A” season beginning on January 20th and the “B” season beginning on September 1st. Historically cod were fished in the summer, so the period when cod are available to the trawl fishery is much greater than the current harvest period. Depending on the catch per unit of effort, the cod fishery is actively fished for approximately a couple of weeks each season to a month or more. Often trawl catcher vessels will switch between harvesting pollock and cod in the Central Gulf of Alaska. There is certainly far more harvesting and processing capacity in the open access cod fishery than would be necessary if the fishery were rationalized. The level of overcapitalization in the trawl cod fisheries is likely similar to pollock, but the level of overcapitalization is difficult to estimate precisely because there are times when the fishery is open and cod are difficult to find.

c. The flatfish fisheries

The potentially largest trawl fishery in the Central Gulf of Alaska is the flatfish complex, especially Arrowtooth flounder. (See fig. 4, below.)

¹² 41.6% of 36,278 is 15,091 metric tons.

Deepwater Flatfish in the CGOA				
Year	ABC	TAC	Harvest	
2008	6,721	6,721	543	
2009	6,927	6,927	428	
2010	2,865	2,865	490	
2011	2,919	2,919	246	
2012	2,308	2,308	246	
5 Year Ave:	4,348	4,348	391	
Harvest as Percent of ABC & TAC			8.98%	

Shallow-water Flatfish in the CGOA				
Year	ABC	TAC	Harvest	
2008	29,873	13,000	8,135	
2009	29,873	13,000	8,195	
2010	29,999	13,000	5,333	
2011	29,999	13,000	3,819	
2012	22,910	18,000	3,322	
5 Year Ave:	28,531	14,000	5,761	
Harvest as Percent of ABC			20.19%	

Rex Sole in the CGOA				
Year	ABC	TAC	Harvest	
2008	6,713	6,713	2,517	
2009	6,630	6,630	4,162	
2010	6,403	6,403	3,284	
2011	6,293	6,294	2,721	
2012	6,412	6,412	1,972	
5 Year Ave:	6,490	6,490	2,931	
Harvest as Percent of ABC & TAC			45.16%	

Arrowtooth flounder in the CGOA				
Year	ABC	TAC	Harvest	
2008	167,936	30,000	25,928	
2009	164,251	30,000	22,813	
2010	146,407	30,000	20,532	
2011	144,559	30,000	27,787	
2012	143,162	75,000	18,213	
5 Year Ave:	153,263	39,000	23,055	
Harvest as Percent of ABC			15.04%	

Figure 4. Flatfish harvests in the Central Gulf of Alaska.

Trawl fishing on these fisheries opens on January 20th and continues throughout the year (even after November 1st). They are limited by the quarterly release of halibut Prohibited Species Allocation (PSA), however.

2. *The Central Gulf of Alaska trawl groundfish industry.*

There are seven shorebased groundfish processors in Kodiak that are consistently supplied by about thirty-eight trawl vessels. The Alaska Groundfish Data Bank listed the plants and the trawl fleet that typically delivers to those plants (as of March 2012) as follows:

Trident Seafoods

1. Alaska Beauty
2. Cape Kiwanda
3. Excalibur II
4. Hazel Lorraine
5. Lisa Melinda
6. Lone Star
7. Marcy J
8. Michelle Renee
9. Miss Sarah
10. Pacific Ram

Westward Seafoods

11. Collier Bros
12. Elizabeth F
13. Gold Rush
14. Hickory Wind
15. Mar Pacifico
16. Progress
17. Vanguard
18. Walter N

International Seafoods of Alaska

19. Chellissa
20. Dawn
21. Laura
22. Marathon
23. Mar Del Norte

North Pacific Seafoods

24. Alaskan
25. Anthem
26. Caravelle
27. Dusk
28. Sea Mac
29. Topaz

Ocean Beauty Seafoods

30. Bay Islander
31. Icy Mist
32. New Life
33. Pac Star

Global Seafoods

34. Leslie Lee
35. Pacific Storm
36. Windjammer

Pacific Seafoods

37. Grumpy J
38. Stella

3. *The estimated value of vessels and plants in the Central Gulf of Alaska trawl groundfish industry.*

It is important to emphasize that this paper is only making gross estimates of the value of the assets in harvesting and processing Central Gulf of Alaska groundfish. It is difficult to

find data on asset values, particularly the value of processing plants. The paper presents these estimates to give an appropriate ballpark of the asset values that the Council might consider. It is anticipated that the *actual* values will be analyzed in greater detail as the issue progresses through the Council process.

The value of a typical Gulf of Alaska trawl vessel depends upon the earnings the vessel makes in the Gulf fisheries. Estimating the value of vessels is complicated by the fact that many Central Gulf of Alaska trawl vessels participate in other fisheries in other regions. Also, the value of those vessels with pollock allocations from the American Fisheries Act is dependent upon how much Bering Sea pollock quota is associated with the vessel. In the mid-1990s, prior to the time when serious discussion of groundfish rationalization in the Gulf of Alaska began, the price of Gulf-style trawlers appears to have been a modest half million dollars or less. (See Attachment Two.)

Another way to estimate a vessel's value is with a recent vessel survey. A vessel survey is typically undertaken by the owner, but surveys at least provide documentation of the surveyor's estimate of the value of the physical vessel itself. We have had the opportunity to examine a number of Central Gulf trawl vessels with recent surveys. The higher quality Gulf trawl vessels typically have a survey value of right around \$1,500,000. (See Attachment Three.) The only way to accurately determine a vessel's value, however, is to know the profits that vessel earns in the existing Gulf groundfish fisheries. Even the vessel survey does not show the profits currently produced from the Gulf. The survey, therefore, is an imperfect estimate.

Assuming that the "average" Central Gulf of Alaska vessel has a value of \$1,500,000, the large bulk of the trawl groundfish harvested in the Central Gulf is taken by thirty-five to thirty-eight vessels, depending upon the year,¹³ therefore the total value of the Central Gulf of Alaska trawl fleet can be estimated to be something in the range of \$52.5 to \$57 million.

Estimating the value of the shorebased processors in Kodiak is also difficult. It is complicated by the fact that many of the plants also process salmon. Salmon, however, is a small component of the major groundfish plant's financial viability and it is possible to isolate the revenue stream generated by groundfish. But there are no survey values to examine for the processing plants, and the earnings from each plant are confidential, so providing documentation of the basis of any estimate is problematic.

Trident does have information on its operations in Kodiak, however. Understanding that this estimate lacks any authentication, working with Trident's current accounting department and its now retired former Chief Financial Officer, we estimated that the value of groundfish processing plants in Kodiak was in the neighborhood of \$72 million.

4. *The estimated value of groundfish quota after rationalization.*

¹³ Personal discussion with Julie Bonney by co-author Joe Plesha.

It is again important to note that the assumed value of groundfish quota in the Central Gulf given in this paper are only estimates. Reasonable people can debate what the value of quota in these fisheries will be after rationalization.

Catcher vessel pollock quota in the Bering Sea for the inshore industry is currently selling for approximately \$1,950 per metric ton. That price, however, includes only the vessel owners' rents earned in the pollock fishery under the American Fisheries Act. It is less clear what the processor's rents might be. Mothership catcher vessel quota in the Bering Sea reportedly sells for about \$2,150 per metric ton. Mothership catcher vessels have nearly an unencumbered IFQ in the pollock fishery, so that might approximate the value of both the harvesting and processing rents earned in the fishery. Shorebased processors should be able to extract slightly greater value from the resource because of greater space for product diversity and recovery. Therefore, to estimate the value of utilization quota for pollock in the Central Gulf of Alaska, a figure of \$2,200 per metric ton seems reasonable.

Pacific cod quota value is estimated based on the authors' understanding of the value of quota in the freezer-longline sector. Freezer-longline cod quota is valued at something like \$5,000 per metric ton. There is a premium paid for longline cod over trawl-caught cod and frozen at sea cod compared to cod processed on shore. That is offset by the flexibility that shorebased plants have in greater recovery of cod byproducts and higher valued-added primary products, such as fillets and even cod for fresh fish markets. A reasonable estimate of the value of cod quota in the Central Gulf of Alaska trawl fishery would be \$5,000 per metric ton.

Given that the five year average pollock TAC delivered to Kodiak from the Central Gulf of Alaska is just a bit over 45,500 metric tons, and assuming that pollock quota would be worth about \$2,200 per metric ton, a reasonable estimate of the total value of Central Gulf pollock quota would be just over \$100,000,000.¹⁴

The trawl apportionment of the Central Gulf Pacific cod TAC averages about 15,000 metric tons, so assuming trawl-caught cod quota would be worth \$5,000 per metric ton, the total value of the Central Gulf cod quota would be \$75,000,000. Combined, the pollock and cod might be worth about \$175,000,000.

IV. Rationalization Considerations

The components listed below are designed to achieve the goals listed in the introduction: (1) Protect existing investments in the fisheries without creating a windfall; (2) Incentivizing bycatch avoidance of PSC; and, (3) Promoting the economy of Kodiak.

¹⁴ 45,500 multiplied by \$2,200 equals \$100,100,000.

1. *Compensation to vessel and plant owners for the losses to the value of specialized capital caused by rationalization.*

There are only two rationales for allocating quota to private entities. The first is in exchange for the socially desirable development work that is both costly and inherently non-proprietary. The pollock and cod fisheries in the Central Gulf began in the mid-nineteen eighties. The business entities involved in the development are much the same as those operating today. We do not believe that it is possible to credibly measure the relative contribution of current participants to the development process. We therefore do not believe it is appropriate to allocate any of the cod or pollock quota on the basis of the positive externalities associated with fishery development.

The second, and in fact the only rationale for allocating quota to private entities in the Central Gulf cod and pollock fisheries is the fact that the value of those investments is expropriated from its current owners and added to the value of the quota that is established by the implementation of rationalization. This seizure is similar to a Fifth Amendment “taking,” but made worse by the fact that typically it is not the general public who receives the expropriated property —as in the case of a Fifth Amendment taking — but instead other private entities who receive allocations of quota to utilize the fish.

Owners of processing plants and fishing vessels in the industrial, capital-intensive fisheries like the Central Gulf of Alaska groundfish fisheries are examples of investors who will suffer large devaluation of their investments through rationalization, depending only upon the durability, malleability and level of overcapitalization in the rationalized fisheries.

The estimates given above regarding the existing value of investments made by owners of processing plants and harvesting vessels, and the value of potential quota, is too speculative to provide a precise “range” of what that allocation to compensate each sector of investors might be. But it appears that forty percent or less of the pollock and cod quota, allocated to both the owners of harvesting vessels and processing plants, may adequately compensate each sector.

To avoid expropriation of wealth, the analysis of any rationalization proposal should carefully examine the value of the current harvesting and processing investments in the groundfish fisheries being rationalized, and estimate the value of the quota that will be created. Allocations of quota that are of a substantially greater value than the amount vessel and plant owners’ investments suffer as a result of allocation creates a windfall for the owners of those assets.

a. Malleability of capital investments

As mentioned above, the level of overcapitalization in the Central Gulf of Alaska is very large. Arguably there is close to eight times more harvesting and processing capacity than necessary in a rationalized fishery. Both the vessels and plants are extremely durable. With routine maintenance, the physical capital used in harvesting and processing groundfish can last nearly indefinitely. There is an issue, however, concerning the malleability of the capital used in harvesting and processing groundfish in the Central Gulf.

There are alternative uses for some of this physical capital and this should be taken into account in the allocation process.

Many of the groundfish shorebased processors in Kodiak also process salmon. We have not examined in this paper the degree to which the capital used in processing groundfish is also used for processing salmon. Our understanding, however, is that the degree groundfish processing equipment is used for salmon is small, both in terms of the relative volume of salmon compared to groundfish and the relative financial importance of salmon compared to groundfish. This is something that should be examined in greater detail, however, in the analysis of any potential rationalization program.

Trawl vessels fishing in the Central Gulf of Alaska appear to be relatively malleable, in that many operate in other fisheries. If you look at the thirty trawl vessels that have fished in the Central Gulf for at least each of the past five years—the vessels that would likely receive the lion's share of any allocation—these thirty vessels have already received an estimated quota value of over \$125,000,000 in other fisheries. (See Attachment Four.) In other words, these vessels have, on average, already received over four million dollars in quota per vessel.

An argument can be made that many of these vessel owners have already been fully compensated for the devaluation in the value of their vessels caused by rationalization. If, for example, a car was totaled in an accident its owner subsequently received the full value of the car from insurance proceeds, but if the totaled car later caught fire and was further damaged, its owner would find great difficulty in collecting a second payment for the damage caused by the fire. The second payment for the fire damage to the car would result in an obvious windfall to the car's owner. It might appear to be a windfall for a vessel owner who has already received quota from other fisheries of a value as great, or greater than, the value of its vessel, to now receive additional quota under a rationalization program.

The other side of that argument is that the Magnuson-Stevens Act requires consideration of investments in, and dependence upon, the fishery.¹⁵ If some Central Gulf trawl vessels were to receive no allocations of quota because of the quota value they had already received in other fisheries, these corporations would be uncompensated for the impacts of rationalization on their investments in the Gulf of Alaska trawl groundfish fisheries. Thus, it could be said, that their investments in, and dependence upon, those Gulf fisheries are being ignored.

b. Allocations through cooperatives or directly to both vessel and plant owners?
Fishing in cooperatives will be essential for bycatch avoidance programs because the government cannot reward industry participants on a timely basis for the avoidance of bycatch. (See Memorandum from Lisa Lindeman to the NPFMC, Feb. 24, 1995, Attachment Five.)

¹⁵ Magnuson-Stevens Act §303A(5).

There is a debate however, whether (for allocation purposes), if it is best to allocate quota directly to both vessel and plant owners, or whether it is preferable to allocate quota to cooperatives in which vessels are somehow linked to an affiliated processor. From an economic perspective, the issue is whether cooperatives with vessel and plant linkage can effectively allocate the appropriate rents between vessel and plant owners so that each sector is compensated for the impacts of rationalization as efficiently as direct allocations of quota to each sector.

There are three basic cooperative structures with linkage between vessels and processing plants which attempt to maintain economic balance between the two sector of investors—vessel and plant owners—after rationalization. These three structures are: cooperatives with permanent linkage, such as the Rockfish Pilot Program; cooperatives where vessels can move after a period of time in open access, such as the American Fisheries Act; and a new concept where a vessel owner must “leave behind” with the processor some of the quota assigned to the vessel if the vessel moves to a new cooperative. Each such cooperative structure complicates the issue of assuring both vessel and plant owners are fully compensated for the impacts that rationalization will have on the value of their investments.

A cooperative like that of the Rockfish Pilot Program, with permanent linkage, creates the problem of bilateral monopolies. A bilaterally monopoly arises when a monopolistic seller¹⁶ deals exclusively with a monopsonistic buyer. Bilateral monopolies are very rare because the price, and thus the sharing of rents, under a bilaterally monopoly, is indeterminate. A seller will not sell for less than its variable costs of production and a buyer will not purchase at a price below its variable costs of production. Within that limitation, however, there is no way to determine what the price will be. In a bilateral monopoly the price that is established must be determined outside of the traditional method of supply and demand.

As Nobel-prize winning economist George Stigler noted, in a bilaterally monopoly price will be determined by such things as “*skill in negotiation; public opinion; coin flipping; a wise marriage. The difficulty in naming interesting examples of bilateral monopoly arises because it is such an unstable form of organization; only the trading between a monopsonist employer and an all inclusive labor organization is likely to survive as an example.*”¹⁷

Because of the bilateral monopoly problem, cooperatives with permanent linkage do not necessarily compensate the impact of rationalization for either vessel or plant owners. The value either sector will receive under such a program is unpredictable.

¹⁶ But for the fact they are established by government action, the creation of an individual fishing quota system that awards an exclusive “privilege” to utilize a specific percentage of the available harvest of a fishery is a clear violation of antitrust laws. Even under the antitrust exemption created by the Fishermen’s Collective Bargaining Act (FCMA) of 1936, members of a FCMA cooperative would be in violation of antitrust laws if they attempted to exclude non-members from a particular fishery.

¹⁷ George Stigler, *The Theory of Price*, 4th Edition, (Macmillan, 1987) p. 215.

Cooperatives that allow for a vessel owner to leave after first spending a period of time in open access create additional problems. There are a relatively small number of trawl vessels in the Central Gulf groundfish fisheries. Vessels that want to move to a new processor-affiliated cooperative could easily form a separate cooperative under the Fishermen's Collective Marketing Act (FCMA) of 1936 while in open access and retain their historical quota and thereby not have any additional costs for being in open access. It would allow a vessel to move from processor to processor without costs.

Even if a vessel were to be required to be in open access for a period of time without participating in a FCMA cooperative, the cost of doing so is quite low. After all, vessels currently have no option but to fish in open access and continue to do so.

If the cost of moving to a new cooperative is equal to the division of rent that is intended between vessels and plants, the cooperative with linkage would seem to achieve its purpose of compensating both sectors at a specific value. For example, if the intention was an equal division of the rents of a fishery between vessels and plants, and the cost of a vessel moving to a different cooperative was half of the value of the existing fishery, then it could be assumed that the rents from the fishery would be equally shared between plants and vessels.

Developing rules which control the movement of vessels between coops that are so precise so as to cause a specific division of rents between vessels and plants is impossible. Even if it were possible, the value of a fishery changes over time, so the costs of changing cooperatives relative to the value of a fishery would always be in flux. In short, it would not be possible to develop a cooperative structure with linkage that accurately divided the value of the fishery between vessels and plants without requiring a vessel that was moving cooperatives to "leave behind" with the processor a specific percentage of the quota associated with that vessel. If, for example, it was intended that vessels and plants share rents equally from the fishery, a cooperative structure that left behind fifty percent of the quota with the processor associated with a vessel (after that harvester switched cooperatives) would achieve this goal. It must be said, however, such a "leave behind" program is essentially the same as allocating quota directly and equally to both harvesters and processors.

2. Compensation to the community of Kodiak caused by rationalization.

a. Allocations directly to the community

Substantial capital investments in support of the existing derby fishery have been made by both the public and private sectors in Kodiak. These investments, in a process identical to that which causes devaluation of harvesting and processing physical capital, will lose value as a result of rationalization. No measurement has been made in the value of such affected investments. This is not an excuse to treat these losses as if they did not exist. Kodiak should be compensated. We believe the best way to do this is through a direct allocation of quota to the community.

b. Impacts caused by consolidation

The potential for consolidation in the Central Gulf pollock and cod fisheries is extreme. There must be caps placed on vessel and plant consolidation or the fishery could constrict to a handful of vessels and one or two processors.

Within those caps there will be consolidation, however. Even with expansion of the flatfish fisheries, the community of Kodiak will be impacted in ways difficult to precisely predict. The Council might consider a program which gives to Kodiak ten percent of the quota that is utilized by entities (vessels or plants) that were not initial recipients of that quota. If, for example, a vessel received an allocation of quota but sold that quota to another entity, ten percent of that quota would be given to Kodiak in a one-time transfer. If the initial quota recipient leased its quota for a year, the community of Kodiak would get ten percent of that leased quota for a year.

The impact of such a program would be to dampen consolidation as a buyer would pay for 100 percent of the quota but receive only ninety percent. In addition, it would compensate for costs the community would face as a result of consolidation.

3. *Reduction of bycatch*

a. Chinook salmon

Chinook salmon bycatch in the Central Gulf is a serious problem. Approximately 13,000 Chinook are taken annually. Because bycatch rates of chinook are about three times higher in the pollock than in the cod fishery, and because these fisheries are prosecuted by essentially the same participants, we recommend that the bycatch reduction program targets only the pollock fishery. The program we recommend would be based upon the 2009 FIP proposal for the Bering Sea.¹⁸ This program would differ from the FIP in that it would use pollock quota, rather than an annual financial commitment from the industry.

We suggest that an amount of pollock TAC that is sufficient to reduce chinook bycatch in the cod and pollock fisheries by fifty percent, be allocated on an annual basis to pollock quota holders on the basis of their relative success at avoiding chinook. On the basis of data from an eight year program where one catcher-processor was incentivized to avoid chinook, *relative* to the rest of the fleet, we estimate that this could be accomplished with a Chinook Avoidance Quota (CAQ) of between ten percent and twenty percent of the pollock TAC. (See Attachment Six). This will impose significant costs on the industry. The reasonable assumption of a linear avoidance opportunity marginal cost function indicates that annual avoidance costs would be one half of the annual rental value of the CAQ. At the \$100,000,000 estimate of the total value of the pollock quota, and an eight percent discount rate, we would expect that a ten percent CAQ would result in annual chinook avoidance expenditures of four hundred thousand dollars. Because half of the value of the CAQ will be

¹⁸ *Analysis of an Incentive-Based Chinook Salmon Bycatch Avoidance Proposal for the Bering Sea Pollock Fishery*, Kochin, Levis A., Riley, Christopher C., Kujundzic, Ana, Plesha, Joseph T., (2009). <http://www.fakr.noaa.gov/npfmc/PDFdocuments/bycatch/SalmonAvoidProposal209.pdf>

expended in Chinook avoidance, only half of the total amount of CAQ would be relevant in any calculation of compensatory allocations to the owners of fishing vessels.

b. Halibut

The anticipated issuance of a TBA that would occur in the rationalization process will reduce the bycatch rate of halibut and pollock fisheries.

4. *Flatfish.*

The flatfish fishery is not yet fully developed in that the harvests total a small fraction of the ABC. This fishery is constrained by halibut bycatch, not TAC. The rationale given in the case of the cod and pollock fisheries (lost in the value of capital), cannot be used to justify a transfer of quota to private entities. A fishery that is not more than about twenty percent developed is not, by definition, overcapitalized. The capital losses that are compensated under reactive rationalization cannot exist without overcapitalization.

There is no principle of economics or law that says that we must wait for a fishery to be overcapitalized before we can consider rationalization. Our convention of allowing fisheries to become overcapitalized prior to rationalization has cost society billions of dollars. We suggest that the council act to rationalize this fishery proactively by allocating quota to the entities that developed this fishery. The rationale for this allocation is the first once mentioned above. This is in exchange for the positive externalities generated in the development process. The development of the flatfish fishery consists of coming up with ways to catch this species while greatly reducing halibut bycatch rates. This will involve considerable investments in gear and experimental operational techniques. We propose that history would begin in the first year after council action on rationalization and end either the year before the first year the TAC is fully harvested in the individual species group, or 2020, whichever comes first. In a proactive rationalization, the distribution of quota should be specified in the final council action. We propose that forty percent of the utilization quota be allocated to both the harvesting and process sectors. The remaining twenty percent would be allocated to CAQ as chinook bycatch rates in the flatfish industry must be significantly reduced. The rationale for including processors as well as harvesters is that bycatch reduction is costly and a proactive rationalization of the fishery would cause a reduction in the ex-vessel price of fish, as a supply of flatfish would remain static. A processing sector that was competing for quota as well as ex-vessel fish would pay more, and would therefore share in the very real costs of developing the techniques and gear that will allow the industry to reduce bycatch rates and utilize this resource to its potential.

The Allocation of Individual Transferable Quotas to Investors in the Seafood Industry of the North Pacific

By Joseph T. Plesha & Christopher C. Riley

A. IMPACT OF PRIVATIZATION OF FISHERY RESOURCES ON INVESTORS IN THE INDUSTRY

1. Investments Made in the Open Access Fishery

During the 1980's the domestic seafood industry was strongly encouraged to invest in the groundfish fisheries of the North Pacific. Promotion of "Americanization" was accomplished through the Magnuson Act's preferential fishery allocation to the domestic industry, the "fish and chips" policy of fishery allocations to foreign nations, Federal government guaranteed loans and tax deferrals, and State of Alaska raw fish tax rebates. With this impetus, investments were made in an open access fishery management regime and the major groundfish species became fully utilized by the domestic seafood industry. The North Pacific Fishery Management Council is now considering privatizing the fishery resources off Alaska with implementation of an Individual Transferable Quota ("ITQ") system.

There are two basic types of investments made in the primary production of seafood; investments in harvesting capacity and investments in processing capacity.¹ To follow is a hypothetical example to help demonstrate some of the impacts an ITQ system will have on the existing investors in the open access fishery.

The first chart is a basic industry profile showing the hypothetical operating characteristics of each sector and the characteristics of the fishery they prosecute.

¹ Fish are highly perishable before being processed into a primary product. Investors in fishing vessels and primary processing capacity have made those investments based on the requirement that fish be handled quickly, i.e. these investors have invested in the "race to fish" caused by the open access fishery management regime. Investors in secondary processing of seafood, on the other hand, have not made their investments based upon the "race to fish" caused by open access. Secondary processors have not overcapitalized as a result of the existing management regime and will not be adversely impacted, therefore, by the privatization of fishery resources. Being that secondary processors are consumers of processed seafood, their investments may benefit if the utilization of fishery resources is increased through privatization.

Basic Production Profile

1.	<i>Fishing Vessels</i>	
	Vessel Cost	\$5,000,000
	Annual Capital Cost	\$500,000
	Annual Depreciation	\$500,000
	Variable Cost (\$/mt)	100
	Catch Rate (mt/day)	68.5
2.	<i>Processing Plants</i>	
	Plant Cost	\$50,000,000
	Annual Capital Cost	\$5,000,000
	Annual Depreciation	\$5,000,000
	Variable Cost (\$/round mt)	\$100 (Excluding fish cost)
	Processing Rate (mt/round weight)	685
	Product value (\$/round weight equivalent mt)	\$400
3.	<i>Annual Harvest (mt)</i>	1,000,000

The fishing and processing operations shown above would reach an open access equilibrium in a 1,000,000 mt a year fishery with 100 fishing vessels delivering to 10 processing plants in a 146 day per year fishing season. The following table shows the operating characteristics of that open access fishery in an equilibrium condition.

Open Access Equilibrium Condition

1.	<i>Fishing Vessels — 100</i>	
	Income	
	1,000,000 mt harvest @ \$200/mt	\$200,000,000
	Costs	
	Variable Costs	\$100,000,000
	Capital Cost	\$50,000,000
	Depreciation	<u>\$50,000,000</u>
	Total Cost	\$200,000,000
	Net Revenue	\$0
2.	<i>Processing Plants — 10</i>	
	Income	
	1,000,000 mt harvest @ \$400/mt (round weight equivalent)	\$400,000,000
	Costs	
	Fish Cost	\$200,000,000
	Variable Processing Cost	\$100,000,000
	Capital Costs	\$50,000,000
	Depreciation	<u>\$50,000,000</u>
	Total Cost	\$400,000,000
	Net Revenue	\$0

2. *Benefits of Privatizing Fishery Resources*

Under open access equilibrium, shown above, both sectors are covering all costs, yet neither sector is earning economic rent from the resource. (Note: Individual operators may, of course, be receiving quasi-rents because of their fishing skills, plant locations or marketing skills, etc..) From the viewpoint of society as a whole, the fishery may be utilized just as effectively by 40 vessels delivering to 4 processing plants, 365 days of the year. This would result in the elimination of 60% of the capital and depreciation costs, for an annual savings (over the open access equilibrium) of \$120,000,000. The 1,000,000 metric ton fishery would generate, then, \$120 per metric ton of economic rent.

Private Property Equilibrium Condition

1.	<i>Fishing Vessels — 40</i>	
	Income	
	1,000,000 mt harvest @ \$140/mt	\$140,000,000
	Costs	
	Variable Costs	\$100,000,000
	Capital Cost	\$20,000,000
	Depreciation	<u>\$20,000,000</u>
	Total Cost	\$140,000,000
	Net Revenue	\$0
2.	<i>Processing Plants — 4</i>	
	Income	Income
	1,000,000 mt harvest @ \$400/mt (round weight equivalent)	\$400,000,000
	Costs	
	Fishing Rights	\$120,000,000
	Fish Cost	\$140,000,000
	Variable Processing Cost	\$100,000,000
	Capital Costs	\$20,000,000
	Depreciation	<u>\$20,000,000</u>
	Total Cost	\$400,000,000
	Net Revenue	\$0
3	<i>Quota Holder Income</i>	\$120,000,00

A comparison between open access equilibrium and private property equilibrium conditions show the benefit that is expected from fishery privatization. In an open access fishery, society receives \$400,000,000 worth of fishery products in exchange for \$400,000,000 worth of resources. In a private property fishery, society receives \$400,000,000 worth of fishery products in exchange for \$280,000,000 worth of resources. In the example above, all of the societal benefits are captured by the ITQ quota holders. (In reality, the government would impose a tax on at least a portion of those rents.)

3. *Impacts of Privatization on Existing Investments.*

The potential benefits of privatized fisheries have been frequently studied. There has been little serious examination, however, of the economic impacts on existing investments in the industry during the transition between open access and privatized fisheries. In a heavily overcapitalized fishery that is capital intensive, and where that capital is both relatively durable and specific to the fishery involved, the owners of that capital should expect significant losses during the transition between the open access and privatized fishery equilibrium conditions.

In this hypothetical example, I have assumed that the quota holders neither harvest nor process fish, but instead contract for these services separately. (The results would be the same, however, no matter which group held quota.) I also assume that there are no alternative uses for either the fishing vessels or the processing plants. While this may be very nearly true for pollock processing plants, fishing vessels may have some alternative uses, such that their opportunity cost more closely approaches the actual earnings they receive from fishing pollock.

A holder of quota would have to contract with a fishing vessel owner to have that quota harvested. Under open access equilibrium 100 boats delivered to 10 plants 1,000,000 mt of fish in a 146 day season. This would mean that immediately after the fishery is privatized, the fleet would be capable of harvesting at 2.5 times the rate necessary to harvest the quota. Under the initial privatization of the fishery, there would be two and one half boats competing for one fishing position. The fishing fleet would likely bid the price down from the average costs (\$200/mt) to something very close to the variable cost (\$100/mt).

The same is true for processing services. The oversupply of processing plants will cause this group to bid up the price of delivered fish to the point where it equals the value of the finished product minus the variable processing costs ($\$400 - \$100 = \$300/\text{mt}$). The quota holder is therefore able to generate \$200 in net revenue from each metric ton of fish, or approximately \$80 per metric ton more than the quota holder will be able to generate when the fishery reaches the private property equilibrium state.

This \$80 per metric ton is a transfer from the owners of the capital investments in the vessels and plants to the quota holders. In effect, immediately after the ITQ system is in place, the owners of quota receive, along with the fishing rights and the corresponding economic rent from the fishery, the right to use other people's property for free!

Open Access to Private Property Transition Period Disequilibrium

1. <i>Fishing Vessels — 100 (Initially)</i>		
Income	1,000,000 mt harvest @ \$100/mt	\$100,000,000
Costs		
	Variable Costs	\$100,000,000
	Capital Cost	\$50,000,000
	Depreciation	<u>\$50,000,000</u>
Total Cost		\$200,000,000
Net Revenue		(\$100,000,000)
2. <i>Processing Plants — 10 (Initially)</i>		
Income	1,000,000 mt harvest @ \$400/mt (round weight equivalent)	\$400,000,000
Costs		
	Fish Cost @ \$100/mt	\$100,000,000
	Fishing Rights @ \$200/mt	\$200,000,000
	Variable Processing Cost	\$100,000,000
	Capital Costs	\$50,000,000
	Depreciation	<u>\$50,000,000</u>
Total Cost		\$500,000,000
Net Revenue		(\$100,000,000)
3. <i>Quota Holder Income</i>		\$200,000,000

Investors in processing plants and fishing vessels will suffer enormous losses during the transition between open access and private property fisheries. These losses reflect the fact that they can no longer expect to receive any return on that portion of capital in excess of the amount "appropriate" for the fishery in question. They also cannot expect to receive any return on that portion of capital that is appropriate until such time as all the "excess" capital has either left the fishery for other employment or simply becomes worn out.

I have tried to quantify the loss that may be suffered by investors of capital in our hypothetical example. The loss to investors as a result of the change from an open access to a privatized fishery is estimated by taking the initial (open access) investment value, the portion of the capital that is appropriate for a privatized fishery and the point in time when the owners of the capital can expect to begin to receive a return on the "appropriate" portion of capital.

In the hypothetical example, the total value of investments under open access is assumed to be \$1,000,000,000, and the portion of the capital that is appropriate to prosecute the resource in a private property fishery was assumed to be 40%. In order to estimate the time period after which investors can expect to begin to receive a return on the appropriate portion of capital, I assume that none of the capital leaves the fishery for other employment and that 10% of the original

capital is consumed each year. In that 60% of the capital is in "excess" of the appropriate amount needed to efficiently utilize the resource, the transition period from an open access equilibrium to a private property equilibrium is six years (if you assume 10% of the capital wearing out each year).

At a ten percent discount rate the \$1,000,000,000 initial capital that vessel and plant owners invested in the open access fishery will have a net present value of only \$225,789,972 when the fishery is privatized.²

B. NEED FOR ALLOCATIONS OF ITQ TO BOTH SECTORS OF THE INDUSTRY.

1. *Rationale for Allocations to Investments Made in the Seafood Industry*

The only reason for giving allocations of ITQ to participants in the seafood industry at all (as opposed to the general public) is as a reward for prior investments of capital in the open access fishery, or as compensation for the decreased value that capital investments will suffer when the fishery is privatized. With either rationale, however, there is no basis for awarding allocations of ITQ to investments in the harvesting sector and not the processing sector.³

In the above hypothetical example, investors of capital in an open access fishery lose over 75% of the value of their investments. Under the current proposals being examined by the North Pacific Council, investors in fishing vessels are compensated for this enormous loss by the receipt of ITQs. There is no reason why investors in processing capacity should not also be compensated for the loss in value of their investments.

2. *Legal Considerations*

The Magnuson Act states that in establishing a system for limiting access to the fishery the council and the Secretary must take into account the "present participation in the fishery" (16 USC §1853(b)(6)(A)). It is clear that this provision would require that the impact of any ITQ allocation on the processing sector also be considered before initial allocations are made. Congress would otherwise have stated that establishment of a limited access system need only consider participation by "fishing vessels" in the fishery, or some other more narrowly drawn requirement.

The Secretary of Commerce cannot be arbitrary and capricious in the awarding of ITQs. There is no rationale for allocating ITQs to investors in fishing capacity and not processing capacity. The one reason that has been expressed for allocating ITQs to only fishing vessel owners is that, under an open access system, the fish become "privatized" when they are first harvested. Therefore, the argument goes, ITQs should be initially allocated to the fishing vessel. This

² NPV after privatization = \$1,000,000,000 x 40% x [1/(1+10%)⁶] = \$225,789,972.

³ Even an auction of the resource to the highest bidder would not compensate those who have invested capital in an open access fishery only to have the value of that investment greatly decreased through privatization.

argument is nonsense. Nothing further need be said than that the fishing vessel (or its owner) does not own the fish when they are harvested—the fishery permit holder owns the fish. Even in the case of factory trawlers, who process their own catch, technically the permit holder transfers ownership of the harvested fish to the vessel for processing. The permit holder typically has no ownership interest in the vessel, but instead is an employee of the owners of the vessel. Further, the initial distribution of ITQs allocate the economic rent from the fishery resources, not just fish. There is no argument which rationally would allow allocations of rent to one segment of capital investment in the industry, but exclude another sector of capital investment in the industry. It would be just as rational to give the allocation of ITQs to owners of red painted vessels only, instead of the owners of vessels painted any other color.

It has also been said that allocations of ITQ have been made only to fishing vessel owners because of political expediency or, more appropriately stated, because of some social benefits. There may arguably be social benefits from lifestyle fisheries where the vessel owner is the master of the vessel and there is a community infrastructure built around the skipper/owner returning home to his family after each fishing trip. But the groundfish fisheries of the North Pacific are different. The vast majority of the investments in groundfish fishing vessels (whether it be a factory trawler or inshore harvester) have been made by individuals who do not work on the vessels. Most of the capital that was invested in these fishing vessels was for the purpose of securing a potential return and was not invested as a means of assuring employment or a specific fishing lifestyle.

There is also a Fifth Amendment "taking" issue if the allocation of ITQs is given only to the owners of fishing vessels. It may seem odd to allege a taking when the government is creating private property from a common property resource; however, taking may result from non-acquisitive regulations. The State and Federal governments strongly encouraged investment in the processing sector, even to the extent of guaranteeing loans to build processing facilities. Clearly the economic impact of ITQs being allocated only to owners of fishing assets will be devastating to the value of processing plants in Alaska. Not only would the value of capital investments be diminished under an ITQ system, but a portion of the economic rent from that capital is appropriated by the recipients of the fishing quotas. There is not a wide variety of the public benefitted by the adoption of an ITQ system and, in fact, the beneficiaries are easily identified as the quota holders. The public good is not served in any apparent reason by giving the economic value of the resource to one sector while excluding another.

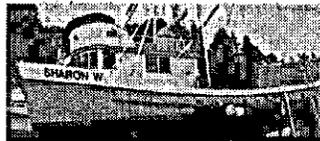
BOATS & BOAT BUILDERS

F/V RAINBOW. 34' Rozema, alum herring bowpicker. 454 Merc., TR2 outdrive, reel and shaker, washdown, 2 steering stations. Packs 17+ tons. Cabin sleeps 2. Spare parts, 4 nets. Located in Unalakleet. \$32,000. (360)856-2511.

03-01-1996 BS KCAJ39-1

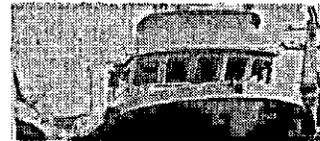
F/V "Celtic", charter/crabber, 50'x 18'x 4.5', certified 48+2, steel, twin 8-V71, 10kw lister, HPS lites, tanked hold, 750 GPM firepump, 2 ton deck crane, very versatile, exceptionally stable, \$130,000. Call for survey and picture. (707)442-7580.

01-01-1996 BS JAYQ05-1



"Sharon W" 52' Kodiak salmon seiner, complete package, including Salmon permit and all gear. Call (907)486-5191.

01-01-1996 BS IDVO29-2



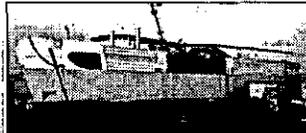
ICY BAY '86 Rozema 6-92 all electronics, press comp. hyd. New engine. \$135,000. (206)284-6148.

02-01-1996 BS JCJM19-2

LARGE REDUCTIONS



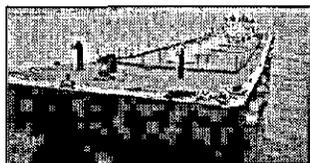
200' Ship Conversion. Out of service for 15 yrs however steel in excellent condition and engine preserved. Needs work to make sea ready or use as floating hotel, camp, etc. We will tow anywhere in the world at a reduced price. Over 300,000 spent! Sell now at scrap price! **Only \$75000** Send \$20 for video or call for brochure.



200' Fishmeal processing plant. Over 3 million invested! Sell well below scrap. **\$95,000 FIRM.** Call for brochure.



152'x25' Chinese Longline Packer. U.S. Marshall Seizure. 6 cylinder diesel Hanshin, 165 KW Yanmar, 165 KW Kubota. Needs cosmetic work and conversion but priced to sell **Only \$28,000**



BUNKER "BARSE 11" 195'x40'x12'. Certified and just out of drydock! 10,722 bbls. fuel oil, 3335 bbls. clean diesel, (3) 10" Kenny Gear Pumps on 6-71 Detroit. Newly painted bottom, topsides, piping, everything! All valves rebuilt, PV valves rebuilt. New plating and framing installed. Market value \$350,000. **Reduced to \$245,000**

40' x 90' Flexifloat Barge

Heavy duty S-50 series. Newly painted & ready to ship. (5) 10x40, (3) 10x20, (4) 10x20 racks. All refurbished & like new. **Reduced from \$175,000 to only \$95,000 for quick sale.**



32' x 110' Deck barge w/building. All steel in perfect condition! Complete interior and exterior sandblasted to white metal and epoxy coated approx. 4 yrs ago! Inside white and like new! (Navy spent over \$200,000!) 3 available and priced to sell quickly. **Only \$75,000 net!**



56' LCM-8. Landing Craft. Refurbished w/new steel work. Twin 6-71's. Lots of extras! **Reduced from 79,500 to only \$48,500!**

101'X28'X13" 1300 HP Ocean Tug "Marine Discoverer" Extensive \$150,000 refit in 931 6T hyd crane, 2nd winch added. 35,000 gal fuel, 2500 gal water. Too many upgrades to mention! Turnkey, ready to sail! Possible tow available with sale. **Quick Sale! Reduced from \$320,000 to \$220,000!**



- 36' LCM-6 Pushboat Conversion. Hull only. With rubber. (Eng's available)ONLY \$ 2,500 FIRM
- 40' F/G PL BOAT HULL ONLY (POWER AVAILABLE).....\$ 2,500
- 40' Ex-Navy Utility Boat. 6-71 Detroit, Turnkey.....\$ 12,500
- Refurbished Double Drum HT Winch. 4-71 Detroit 25000 SLP was \$25KONLY \$ 17,500

WESTCOAST MARINE

PO Box 6170
Chula Vista, CA 91909

619-423-8379



92' trawler. 800 hp. Turn key. Cond. New survey. Too many extras to list. Ak drag. Serious buyers. **PRICE REDUCED TO \$195,000.** (360)289-2050.

01-01-1996 BS JAYQ48-1



42' LeClerq 1979 fiberglass sainer, light colored interior, 6,000 hrs on GM871, excellent condition, roll chaulks, vang, stabies, sea 222, 2 VHF, 2 CB, plotter, 2 depth, 36 Furuno, holds 45,000 lbs. \$139,000 or trade. (360)375-6035.

01-01-1996 BS JFXO22-1

20'-22' SKIFF

NOW AVAILABLE IN A BRAND NEW SELF-BAILING DECK MODEL!

- 7'8" beam
- All welded
- Inside tie rail
- 8' wide bottom
- 32" side height
- Tow pocket in bow
- Full height stopwell
- Binned compartments
- BIG 2 3/4" dia. gunwale
- Flotation compartments
- Interior non-skid surface
- .190 / 3/16" aluminum throughout

22' \$5,995 • 20' \$5,695

Steering Console Complete with Steering: add \$395 • Self-Bailing Deck: add \$1,800

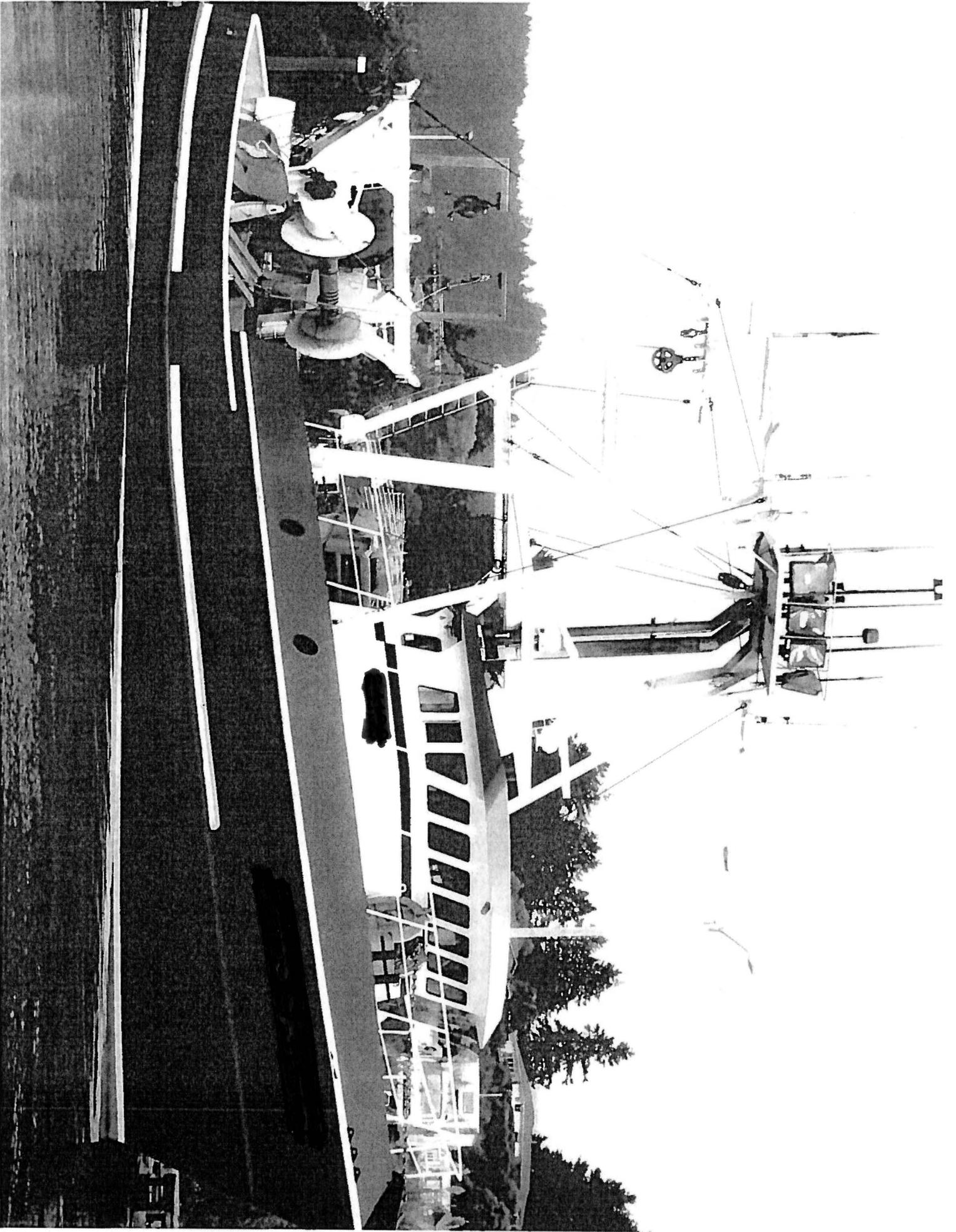
QUALITY COMMERCIAL SKIFFS!



PACIFIC SKIFFS, INC

5811 - 48th Drive NE • Marysville, WA 98270 USA • (360) 658-7111

ORDER NOW to be included in our next production run!



CAPTAIN B.T. BESSELLIEU

Phone: (707) 442-4927
Date of inspection: August 26, 2008

REPORT OF SURVEY

Vessel _____ Construction steel
Home Port _____ Official No. _____ Tonnage, Gross 192 Net 131
Owner _____ Address _____

HULL TYPE oil screw/raked stem/square stern SERVICE crab/shrimp/mid-water/bottom fishing
Dimensions: Length 94.1' Beam 27.0' Depth 13.2' Mast/Boom steel kingpost
Year Built 1987 at Bayou La Batre, Alabama Builder Johnson Shipyd Last Drydocked Aug. 2006

Description 104' LOA- after 2004 fire boat converted to a Whale Back design all welded steel hull with a single hard chine and full keel commercial fishing troller/trawler. Equipped with a 60 hp "Bow Thruster" tube mounted through fore/foot stem. The propeller is fitted with a "Kort Nozzle". Has a raised foredeck to back approximately one half length of boat. Has 31 1/2" high double rung handrails both sides from stem to aft corner upper deck. Portside has a five feet high by twelve feet long shelter deck equipped with 31 1/2" high double rung handrails. Boat is equipped with 11" x 21" freeing ports commencing from aft house to stern. The forward fish hold has a 6" high steel coaming and a 88" x 92" opening with a fitted steel bolt down cover. Second fish hold further aft has same measurements with both having a Baier 17" x 26" deckplate built into centerline existing covers. There are twelve 17 1/2" dia. Baier flush deckplates each side fish holds and one centerline aft. One 26" dia. Baier deckplate portside aft leading into lazaret.

Planking 5/16" steel Frames 1/2" x 3" x 4" steel angle Spaced 18" centers average
Deck 5/16" steel Beams 1/2" x 3" x 4" steel angle Spaced 18" centers average

Cabins and how ventilated aluminum dutch doors each side pilothouse facing aft-several 13" dia. four dog portholes about house-steel W'D aft maindeck house portside
Cabins/Pilot House: Location: FWD X Aft _____ Amidships _____ Material 3/16" steel

Deck House Layout one main deckhouse with enclosed pilothouse above-no flying bridge-central passageway with galley aft across-one single berth stateroom portside amidship-four berth stateroom stbd. side amidship-forecastle

Galley Kenmore Classic electric grill/two-burners oven stove-Kenmore upright 20 cu. ft. ref/freezer-large formica counter with nenerous builtin drawers/cabinets etc.-large table with padded bench seats

No. berths in Forecastle 1 No. Berths in MAIN DECK House 5 Marine Toilet toilet/shower basin
FIRE EXTINGUISHERS: 5 lb Halon and 5 lb ABC pilothouse-10 lb ABC forcastle-10 lb ABC galley-10 lb ABC engine room-10 lb ABC in passageway-15 lb ABC engine room-20 lb CO2 and Fireboy automatic release/manual engine room

ENGINE ROOMS & PROPULSION MACHINERY: Main Engines Cummins V12-KTAL138 Turbo H.P. 1200

Manufactured by: Cummins Engine Co. Fuel diesel Last Overhauled 2005
Age of Engine 10 1/2 yrs Engine Cooling System keel coolers Engine Alarm yes

Engine Foundation 1/2" steel frame Fuel Consumption Per Hour est. 60 gals
Fuel Capacity 38,000 gals No. Tanks 4 Location two wngs/ Material steel

Fill Lines through deck fitting vented to atmo Shut Off Valves at two stern tanks/ Fuel Lines steel to flex manifold
Fresh Water Tanks one forepeak Capacity 4281 gal Bilge Alarm yes Fire Alarm atomic extinguishing

PUMPS: Manual Bilge Pumps - No. - Size - Electric Bilge Pumps - No. 4 Size see engine room
Power Bilge/Wash Down Pumps - No. _____ Size see engine room

Auxiliary two John Deere 6 cyl TC diesel-one Cummins 6B drives Lima 40 KW gen.
Tail Shaft 6" SS Propellers: four black bronze-72" Kaplan (Kort Nozzle) Rudder steel Speed in Miles 12 K

ELECTRICAL SYSTEM: 12/24/110/220V-three 8V/4D-four 12V/8D batteries all stowed in acid proof trays well above bilge Overload Protection circuit breakers with dial master shut off's
Wiring Type plastic marine insulated in conduit Exhaust Stack & Stove Pipe Clear of wood work? insulation wrapped-all auxiliary's piped out main exhaust

ELECTRONICS & SPECIAL EQUIPMENT:

Auto Pilot: Two-Simrad's AP50's Fathometer: Furuno 1200 Video Sounder
 Loran: Furuno LC 90 Direction Finder: Two-Furuno GPS GP 30
 Radio: Two-Furuno 1408 SSB Gurdies: none
 Radar: Furuno 2117/96 mile range Power Block: yes/hyd.-not onboard time of
 C.B. Radio: Ranger 1510 MK 3 Refrigeration: survey Chill Sea Water
 Anchor Gear/Deck Machinery hyd. anchor winch-1,000 lb. anchor-20 fm. 1"chain-100 fms.
1"wire-steel anchor fairlead/roller stem

Person Representing vessel during survey: [REDACTED]
 Engine running during survey no Engine Hours 10,600
 Vessels cruising range relative to fuel capacity estimated 26 days
 Were recommendations explained to owner/representative? none required
 Vessels running lights - comply with USCG Regulations? yes
 Time limit for compliance with recommendations none required
 Was owner/representative given copy of recommendations? none required
 Fire fighting equipment comply with N.F.P.A. 302 standards? yes
 No. Crew [REDACTED] Requested by owner
 Surveyed a float at [REDACTED]
 Waters navigated Pacific Coast/Alaska out 250 miles Operator's Experience [REDACTED]
 Estimated Replacement Value \$ 2,200,000/2,400,000 Estimated Present Market Value \$ \$ 1,450,000/1,550,000

Remarks, Defects or Recommendations are listed on attached sheet if required.

ADDITIONAL ELECTRONICS

- | | |
|--|---|
| 1-Second Radar-Furuno 2117/96 mile range | 7-Furuno 1100 ^{Surveyor} Video Sounder |
| 2-Motorola Cellular Telephone | 8-Two Furuno Simrad FS 20 Net Sounders |
| 3-VHF radio-Ross DSC 500 transceiver | 9-Two-Sonars-one CH 250 and CH 37 |
| 4-VHF radio-ICOM IC 228H | 10-Two-Dell Computers drives LC wind Plot Simrad Olex |
| 5-VHF radio-ICOM IC 229H | 11-Furuno Weather Fax 208 |
| 6-Two-RDI Bridge Watch | 12-Mitsubishi Tag Satellite Phone |

PILOTHOUSE LAYOUT: formica console across forward with center section running aft 44"-entire counter console has electronics mounted atop with storage cabinets beneath-padded captain swivel chair each side-8"dia. Ritchie dome liquid compass-20"dia. wood spoked steering wheel-Morse shift/speed controls-Simrad lever steering-Bow Thruster lever control portside console-large console across aft with cabinets beneath-overhead chart desk starboard side and chart storage bin overhead portside-Morse speed/shift controls portside-access to galley centerline aft-entire area finished in white formica and composition covering deck

FISH HOLDS: both rigged for Chill Sea Water-also both holds fully insulated covered with fiberglas-steel stanchions and aluminum bin boards-both have screened sumps

STEERING: double ram hydraulic steering with backup electric

HEATING: several wall heaters throughout deckhouse made by Dayton

ELECTRICAL PANELS: all are either General Electric/AB or Cutler Hammer

EXTERIOR WORK LIGHTS: four 1,000W Quartz mounted gantry with two facing aft and two facing forward
 three 1,500W Sodium Vapor mounted booms facing deck
 four 1,500W Sodium Vapor mounted crosstree facing forward
 two 1,500W Sodium Vapor mounted crosstree facing aft

- k. 15hp AC hydraulic steering unit
- l. hot water heater
- m. 1½ hp air compressor - hand and power tools
- n. pilothouse has one bunk
- o. lazaret has foam insulation with the side and bottom fiberglassed
- p. access to forecabin is through raised aluminum WTD
- q. day tank alarms and Video Monitor System

COMMENTS

This examination has been made without making removals or opening up to expose parts ordinarily concealed, or testing for tightness and is subject to any conditions which would have been revealed, if such procedures had been accomplished further, no determination of stability characteristics or inherent structural integrity has been made, and no opinion is expressed with respect thereto. General maintenance and upkeep is considered well above average. Survey was made without prejudice and for the benefit of whom it may concern.

RECOMMENDATIONS

none at this time

SAFETY EQUIPMENT: Elliot 6 man canister liferaft mounted atop house clear of rigging- (next repack date Nov. 2008)- Kodon EPIRB 406 mounted atop house-(battery expires Nov. 2008)-(hydrostatic release expires Nov. 2008)- hand held locate/alert flares all expire 2011- five Imperial exposure suits all have lights and reflector tape-four 24" dia. liferings with two having 90 feet line attached-ample First Aid Kit and manual- four lifejackets-Todd Whaley has a CPR/FIRST AID/ SAFETY Certificate

SPECIAL NOTE: reported that the boat will be going on drydock in [REDACTED].
A diver recently checked the bottom and found all zincs over 80% good.

*SIMRAD E-S-60 COST W/INSTALLATION 70,000.00
AUG OF 2010
ALL DECK EQUIPMENT SETTING ON 3/4 PLATE
LAST 20 FT OF BULLWORKS 1/2 PLATE IN STERN*

MAINDECK HOUSE LAYOUT:

central passageway-galley forward across with cooking center starboard side-seating/large table portside directly aft seating is a berth stateroom-well aft is a alcove into access ladder into engine room and afterdeck-Kenmore 23 cu. ft. chest freezer setting in alcove-starboard side amidship is a four berth stateroom-well aft is a wood door leading into toilet/shower/wash basin- all rooms off passageway have wood doors-area finished in white formica-deck composition covering- entire deckhouse is said to have from 2 to 4" foam insulation-stowed in toilet area is a Westinghouse Washer/Dryer stacked

AFTERDECK DECK LAYOUT:

from even aft corner house to stern the solid steel bulwarks is 38"high with partway across stern is a 8 foot wide stern ramp-two independant hydraulic net reels mounted over stern ramp-12"x12" tri-steelstanchions and a 12"x 12" boxed steel gantry across top with one 18"dia. steel block shackled each wing of gantry so as to suspend the steel drag doors-a third hydraulic net reel mounted centerline maindeck-one hydraulic drag winch mounted atop upper deck each side with each containing 1200fms of 7/8"wire-four hydraulic lift winches mounted upper deck- two 25,000lb Pullmaster and two 12,000 Pulmaster-Hydro Star Piston motors-Spinbord motor-6"high wood deck gradings and 22"high wood checkers set in steel stanchions welded to deck evenly spaced- steel outriggers

- ENGINE ROOM:
- a. Twin Disc 540/5:1 hydraulic reduction gear main engine
 - b. cooling water tank with a Murphy low level water alarm
 - c. Lewco 12V Constavolt and a Lewco 24V Constavolt
 - d. two 6"dia. centrifugal bilge pumps driven by a Baldor 15hp electric motors-connected to Thermomatic Marine Refrigeration Chill Sea Water Thermal-Tec unit with a 95hp Compressor and Teco 3 phrase 60hp electric motor this unit chills sea water 28 degrees F (2 degrees C) or brine to 0 degrees F (18 degrees C)-high flow rate and rapid heat transfer Chills Sea Water quickly-there are three 12"dia. by 8 feet long pipes mounted aft engine room across bulkhead plus additional piping
 - e. two Flomax 1 3/4"bilg pumps driven by two Baldor electric motors
 - f. one 2" centrifugal pump driven by a Baldor 3hp motor
 - g. one 3" Flomax pump driven by a 7 1/2hp motor
 - h. Con Tech Power System panel 208 volts
 - i. Twin Disc Power Take Off forward engine drives three 60 gal each Vickers pumps
 - j. one steel hydraulic reserve tank 754 gals
 - k. one steel lube oil reserve tank 260 gals
 - l. Grunfos fresh water pump
 - m. 1 1/2"x2" condenser pump with spare
 - n. engine room vented doors
 - o. Racor fuel filter system
- AUXILIARY'S:
- John Deere 5.9 drives 90 KW 3 phrase 120/208 generator
 - John Deere 6.8 drives 112Kw 3 phrase 120/208 generator
 - Cummins 6B drives 60Kw 3 phrase 120/208 generator

- MISCELLANEOUS:
- a. 25hp electric motor drives third winch
 - b. 60hp AC powered Carrier refrigeration compressor
 - c. boat has a "STABILITY REPORT" by Bruce Colver dated 2004
 - d. Wesfalia fuel/water Separator mounted portside engine room
 - e. all auxiliary's are equipped with cooling water tanks and Murphy low level water alarms
 - f. boat equipped with a 100 gal holding tank
 - g. equipped with alarms on all four water tight compartments
 - h. two each 6hp air compressor's-vice and drill press
 - i. AC gas welding equipment
 - j. 25hp outboard engine and inflatable boat

			AFA IFQ Shorebased (MT)	AFA IFQ Shorebased Value	AFA IFQ Mothership (MT)	AFA IFQ Mothership Value	Bering Sea R. King Crab Pounds	Bering Sea R. King Crab Value	Bering Sea Snow Crab (Lbs)	Bering Sea Snow Crab Value	Rockfish IFQ Shorebased (Lbs)	Rockfish IFQ Shorebased Value	Whiting IFQ Shorebased (MT)	Whiting IFQ Shorebased Value	Whiting IFQ Mothership (MT)	Whiting IFQ Mothership Value	Non-Whiting Groundfish (Lbs)	Non-Whiting Groundfish IFQ Value	Total Quota Value		
1	Bay Islander	92	0	\$0	0	\$0	0	\$0	0	\$0	321,371	\$429,350	2,060	\$1,930,158	198	\$196,566	320,660	\$566,952	\$3,123,025	1	
2	Cape Kiwanda	91	1,239	\$2,353,872	0	\$0	0	\$0	0	\$0	923,168	\$1,233,351	0	\$0	0	\$0	0	\$0	\$3,587,222	2	
3	Caravelle	102	0	\$0	0	\$0	0	\$0	0	\$0	1,011,365	\$1,351,181	0	\$0	0	\$0	0	\$0	\$1,351,181	3	
4	Chelissa	116	0	\$0	0	\$0	0	\$0	0	\$0	334,555	\$446,964	1,190	\$1,114,888	0	\$0	419,522	\$702,725	\$2,264,577	4	
5	Collier Brothers	108	642	\$1,219,701	0	\$0	0	\$0	0	\$0	792,233	\$1,058,422	1,032	\$967,008	0	\$0	259,083	\$404,921	\$3,650,052	5	
6	Dawn	103	0	\$0	0	\$0	0	\$0	0	\$0	699,767	\$934,887	0	\$0	0	\$0	0	\$0	\$934,887	6	
7	Dusk	103	0	\$0	0	\$0	0	\$0	0	\$0	1,088,852	\$1,454,704	0	\$0	0	\$0	0	\$0	\$1,454,704	7	
8	Elizabeth F	108	1,684	\$3,200,261	0	\$0	18,014	\$705,518	0	\$0	1,038,001	\$1,386,767	0	\$0	0	\$0	0	\$0	\$5,292,547	8	
9	Excalibur II	92	2,922	\$5,551,840	0	\$0	0	\$0	0	\$0	1,067,019	\$1,425,534	0	\$0	0	\$0	0	\$0	\$6,977,375	9	
10	Gold Rush	112	2,222	\$4,221,493	0	\$0	0	\$0	0	\$0	1,278,803	\$1,708,478	0	\$0	0	\$0	0	\$0	\$5,929,971	10	
11	Hazel Lorraine	107	2,098	\$3,985,792	0	\$0	0	\$0	0	\$0	592,753	\$791,917	0	\$0	0	\$0	0	\$0	\$4,777,709	11	
12	Hickory Wind	109	1,500	\$2,849,867	0	\$0	0	\$0	0	\$0	1,174,146	\$1,568,657	0	\$0	0	\$0	0	\$0	\$4,418,524	12	
13	Laura	112	0	\$0	0	\$0	0	\$0	0	\$0	1,682,432	\$2,247,725	0	\$0	0	\$0	0	\$0	\$2,247,725	13	
14	Leslie Lee	108	0	\$0	0	\$0	0	\$0	0	\$0	771,035	\$1,030,101	47	\$43,721	1,614	\$1,600,939	884,036	\$1,236,438	\$3,911,198	14	
15	Lisa Melinda	97	1,158	\$2,199,286	0	\$0	0	\$0	0	\$0	0	\$0	2,413	\$2,261,281	1,775	\$1,760,526	272,299	\$407,188	\$6,628,282	15	
16	Mar Del Norte	103	0	\$0	0	\$0	0	\$0	0	\$0	985,559	\$1,316,704	0	\$0	0	\$0	0	\$0	\$1,316,704	16	
17	Mar Pacifico	115	0	\$0	0	\$0	0	\$0	0	\$0	1,472,621	\$1,967,418	0	\$0	0	\$0	0	\$0	\$1,967,418	17	
18	Marathon	92	0	\$0	0	\$0	0	\$0	0	\$0	1,343,298	\$1,794,643	522	\$489,290	1,924	\$1,908,437	254,149	\$397,690	\$4,590,061	18	
19	Marcy J	116	971	\$1,845,427	0	\$0	13,913	\$544,903	98,654	\$1,066,704	1,327,135	\$1,773,049	0	\$0	0	\$0	0	\$0	\$5,230,083	19	
20	Michelle Renee	114	0	\$0	0	\$0	0	\$0	0	\$0	2,952,496	\$3,944,527	0	\$0	0	\$0	0	\$0	\$3,944,527	20	
21	Miss Sarah	124	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	2,523	\$2,363,511	408	\$404,808	279,744	\$839,232	\$3,607,551	21	
22	New Life	82	0	\$0	0	\$0	0	\$0	0	\$0	729,273	\$974,307	699	\$655,173	59	\$58,775	283,099	\$504,062	\$2,192,318	22	
23	Pacific Ram	92	1,098	\$2,086,740	0	\$0	0	\$0	0	\$0	112,224	\$149,931	2,082	\$1,950,732	474	\$469,811	241,132	\$366,198	\$5,023,412	23	
24	Peggy Jo	119	1,793	\$3,406,510	0	\$0	0	\$0	0	\$0	2,402,994	\$3,210,394	0	\$0	0	\$0	0	\$0	\$6,616,904	24	
25	Progress	124	5,464	\$10,381,040	0	\$0	0	\$0	0	\$0	651,370	\$870,229	0	\$0	0	\$0	0	\$0	\$11,251,268	25	
26	Sea Mac	96	0	\$0	0	\$0	0	\$0	0	\$0	334,555	\$446,964	0	\$0	0	\$0	0	\$0	\$446,964	26	
27	Stella	72	0	\$0	0	\$0	0	\$0	0	\$0	1,003,659	\$1,340,887	0	\$0	0	\$0	0	\$0	\$1,340,887	27	
28	Topaz	96	361	\$686,286	0	\$0	0	\$0	0	\$0	1,611,693	\$2,153,218	0	\$0	0	\$0	0	\$0	\$2,839,504	28	
29	Vanguard	113	305	\$579,997	5,778	\$12,422,700	0	\$0	0	\$0	988,217	\$1,320,255	0	\$0	0	\$0	0	\$0	\$14,322,952	29	
30	Walter N	114	1,762	\$3,347,151	0	\$0	0	\$0	0	\$0	770,322	\$1,029,149	0	\$0	0	\$0	0	\$0	\$4,376,300	30	
Ave. Length =		104																	Total	\$125,615,831	
																			Average	\$4,187,194	



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic & Atmospheric Administration
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DATE: February 24, 1995

MEMORANDUM FOR: North Pacific Fishery Management Council

FROM: Lisa L. Lindeman
Alaska Regional Counsel

SUBJECT: Due Process and the Harvest Priority Proposal

This responds to the North Pacific Fishery Management Council's request for a legal review of the due process aspects of the Harvest Priority Proposal (HPP) currently under consideration.

Under the HPP, the total allowable catch (TAC) in certain fisheries would be initially allocated between an open access TAC and a TAC that could be harvested only by vessels participating in a limited entry program. The HPP would set maximum acceptable bycatch rates for the open entry fisheries. The eligibility criteria for participation in the limited entry program would be a vessel's bycatch performance in the previous open entry fishery. A vessel failing to meet the bycatch standards would be excluded from the follow-up "reward" fishery either in the same or following year. Specifically, you have asked whether a vessel receiving an adverse initial determination, and whose owner administratively appeals that determination, can be excluded from a "reward" fishery prior to completion of an administrative hearing.

Summary

It is clear that a vessel that fails to meet bycatch standards cannot be excluded from any subsequent "reward" fishery until the vessel owner has first been given the right to an administrative hearing. As cases involving bycatch standards inevitably involve complex factual determinations, the hearings that will be required will just as inevitably be adversarial in which the appellants will have the right to dispute the government's case through presentation of their own evidence and arguments, and the right to confront and cross-examine adverse witnesses. The period of time



between the date of violation and final agency action can be best estimated by reference to the agency's experience under the existing Vessel Incentive Program (VIP). The most optimistic estimate that can be made is that the process will take approximately two to three years; in some cases, longer.

Discussion

Procedural Due Process

"Procedural due process imposes constraints on governmental decisions which deprive individuals of 'liberty' or 'property' interests within the meaning of the Due Process Clause of the Fifth or Fourteenth Amendment." Mathews v. Eldridge, 424 U.S. 319, 332 (1976). See also, Cleveland Bd. of Educ. v. Loudermill, 470 U.S. 532, 538 n. 3 (1985); Cassim v. Bowen, 824 F.2d 791, 796 (9th Cir. 1987). Licenses to pursue one's livelihood are clearly a "property" interest within the meaning of due process. See e.g., Barry v. Barchi, 443 U.S. 55, 64 (1979); Chalkboard, Inc. v. Brandt, 902 F.2d 1375, 1380 (9th Cir. 1989); Atlantic Richfield v. U.S., 774 F.2d 1193, 1202-1203 n. 39 (DC Cir. 1985). Although the legislative act of creating such a right is a matter of legislative grace, once created, it becomes a "property" interest protected by procedural due process. Cleveland Bd. of Educ. v. Loudermill, supra at 538; Hornsby v. Allen, 326 F.2d 605, 608 (5th Cir. 1964). The fact that the statutory right thus created can be termed a "privilege" is irrelevant. Goldberg v. Kelly, 397 U.S. 254, 262 (1970); Hornsby v. Allen, supra at 609. The protections of procedural due process are not only applicable to existing licenses (Chalkboard, Inc. v. Brandt, supra; Atlantic Richfield v. U.S., supra), but to the adjudication of initial eligibility for such licenses as well. Hornsby v. Allen, supra at 610.

The courts are unequivocal about the right to a hearing of some sort prior to adverse government action affecting a "property right" (such as the ability to pursue one's occupation). Cleveland Bd. of Educ. v. Loudermill, supra at 542; Mathews v. Eldridge, supra at 333; Goldberg v. Kelly, supra at 267; Goldsmith v. U.S. Bd. of Tax Appeals, 270 U.S. 117, 123 (1926); Lipke v. Lederer, 259 U.S. 557, 562 (1922); Chalkboard, Inc. v. Brandt, supra at 1380; Cassim v. Bowen, supra at 797; Hornsby v. Allen, supra at 608. The absolute right to a hearing is in no way dependent upon a showing of probable success. Cleveland Bd. of Educ. v. Loudermill, supra at 544.

Procedural due process is a flexible concept (Mathews v. Eldridge, supra at 334; Goldberg v. Kelly, supra at 262-263), and has been described as follows:

An essential principle of due process is that a deprivation of life, liberty, or property 'be preceded by notice and opportunity for hearing appropriate to the nature of the case.'

Chalkboard, Inc. v. Brandt, supra at 1380. See also, Cleveland Bd. of Educ. v. Loudermill, supra at 546; Cassim v. Bowen, supra at 797. The only issue, therefore, is the sort of pre-deprivation hearing that will be deemed appropriate in any given situation. At a minimum, procedural due process requires a pre-deprivation procedure that involves notice of the evidence that forms the basis of the government's case against the individual and an opportunity for that individual to respond in a meaningful way to that evidence (e.g., in person or by written submission). Cleveland Bd. of Educ. v. Loudermill, supra at 546; Goldberg v. Kelly, supra at 268 n. 15. In some circumstances, depending upon the nature of the inquiry at hand, the right to respond to the evidence will include a right to refute the government's evidence by oral presentation of the appellant's own arguments and evidence and to confront and cross-examine adverse witnesses at a pre-deprivation adversarial hearing. Goldberg v. Kelly, supra at 267-268.

The Supreme Court has developed a three-part test to determine the nature of the pre-deprivation hearing that will be deemed appropriate in any given situation.

[O]ur prior decisions indicate that identification of the specific dictates of due process generally requires consideration of three distinct factors: First, the private interest that will be affected by the official action; second, the risk of an erroneous deprivation of such interest through the procedures used, and the probable value, if any, of additional or substitute procedural safeguards; and finally, the Government's interest, including the function involved and the fiscal and administrative burdens that the additional or substitute procedural requirement would entail.

Mathews v. Eldridge, supra at 334-335. See also, Cleveland Bd. of Educ. v. Loudermill, supra at 542-543; Chalkboard, Inc. v. Brandt, supra at 1380; Cassim v. Bowen, supra at 797.

The private interest discussed in most of the cases cited above involved the individual appellant's interest in a continuing source of income during the pendency of the appeal.

"[T]he significance of the private interest in retaining employment cannot be gainsaid. We have frequently recognized the severity of depriving a person of the means of livelihood.

Cleveland Bd. of Educ. v. Loudermill, supra at 543. See also, Mathews v. Eldridge, supra at 341; Chalkboard, Inc. v. Brandt, supra at 1381. In only one case, that of welfare recipients, was this sort of private interest deemed to be so compelling as to require a full pre-deprivation adversarial hearing. Goldberg v. Kelly, supra. For our purposes, however, it is important to note that in each of the cases that allowed something less than a pre-deprivation adversarial hearing, the agency had the ability to fully compensate any appellant who was ultimately successful - usually through back payments. Thus, the private interest involved was never the risk of a potential loss of benefits altogether, but merely that of going without such benefits during the pendency of the appeal. In the HPP, loss of participation in the "reward" fishery cannot be recouped at some later date should an appeal of the agency's initial determination prove successful. Compensation cannot be made for the lost fishing opportunities in a fishery from which a vessel has been wrongfully excluded. It seems likely, therefore, that the private interest involved under the HPP will require a pre-deprivation adversarial hearing.

The second element of the Mathews test, that of the risk of erroneous deprivation, is of great concern under the HPP. This risk is clearly to be measured in the context of the nature of the evidence under consideration by the agency. Mathews v. Eldridge, supra at 345. It has been analyzed as whether the agency can establish probable cause under the procedures in use. Barry v. Barchi, supra at 66; Bell v. Burson, 402 U.S. 535, 540 (1971). In cases in which the courts have upheld agency procedures that provided something less than a pre-deprivation adversarial hearing, there has either been no factual dispute at all (Codd v. Velger, 429 U.S. 624, 627 (1977); Atlantic Richfield Co. v. U.S., supra at 1203), or the "factual issue to be determined was susceptible of reasonably precise measurement by external standards" (Chalkboard, Inc. v. Brandt, supra at 1381) such as the findings of medical experts. Barry v. Barchi, supra at 65; Cassim v. Bowen, supra at 798 n. 3. Where factual disputes are not susceptible to reasonably precise measurement by external standards, especially where the factual disputes involve "issues of witness credibility and veracity," the risk of erroneous deprivation of constitutionally protected property interests is deemed too high and a pre-

deprivation adversarial hearing is required. Chalkboard, Inc. v. Brandt, supra at 1381. Given the fact that the HPP is based upon factual determinations made by at-sea observers, the accuracy and competence of which will inevitably be the central issue in any appeal of adverse determinations, it seems very likely that the courts will require an adversarial hearing prior to exclusion from any "reward" fishery.

Finally, it is doubtful that the government's interest in avoiding the fiscal and administrative burdens involved in providing appellants under the HPP with adversarial hearings prior to their exclusion from any subsequent "reward" fishery will outweigh either the private interests of the appellants or the risk of erroneous deprivation of those interests, as discussed above. This is especially true in light of the fact that under the existing VIP, this is precisely what the agency is now providing.

Penal Aspects of the HPP

Under the VIP, owners/operators of offending vessels have been subject to substantial civil penalties pursuant to section 308 of the Magnuson Fishery Conservation and Management Act, 16 U.S.C. 1858. Under the HPP, vessels failing to meet the bycatch standards would be excluded from participating in the follow-up "reward" fishery, either in the same or following year. Much has been made of the supposed difference between the HPP and VIP; that is, that unlike the VIP, the HPP is not "penal" because it does not seek to penalize those who do not meet the bycatch standards, but rather, seeks to "reward" those who do. From a due process/Administrative Procedure Act (APA) perspective, this is a distinction without a difference. The due process/APA rights to a prior hearing at issue in such a program are not the rights of those who get to participate in the "reward" fishery, but are, rather, the rights of those who are excluded from the fishery. For those excluded, the follow-up fishery is not a "reward:" it is a "sanction." Their exclusion from it based upon an agency determination that they have not met the bycatch standards applicable in a previous fishery is

¹ The APA definition of "sanction" provides in pertinent part that a "'sanction' includes the whole or part of an agency--... (F) requirement, revocation, or suspension of a license; or (G) taking other compulsory or restrictive action." 5 U.S.C. 551(10).

just as "penal"² as the imposition of civil penalties for the same transgressions under the VIP.

A clear understanding that the "reward" fishery provisions of the HPP are in fact "penal" and constitute a "sanction" leads to certain inevitable results under due process, the APA, and the Magnuson Act (and its implementing regulations).

Procedural Due Process As Applied

There is a further constitutional problem with excluding appellants from participation in a "reward" fishery under the HPP prior to opportunity for an adversarial hearing. Even when the courts uphold an agency procedure providing something less than a full pre-deprivation adversarial hearing as facially valid, that same procedure can be violative of procedural due process as applied to the individual facts of the case if the agency does not provide a prompt post-deprivation hearing.

The Due Process Clause requires provision of a hearing 'at a meaningful time.' At some point, a delay in the post-termination hearing would become a constitutional violation.

Cleveland Bd. of Educ. v. Loudermill, supra at 547.

The general rule is that the less the predeprivation process, the greater must be the post-deprivation process.

Cassim v. Bowen, supra at 798.

In situations where imposition of a "penalty" is involved, the issue of a prompt post-deprivation hearing can be of particular importance. The leading case in this area is Barry v. Barchi, supra, which stands for the proposition that if the post-deprivation hearing does not occur before the appellant suffers a "penalty" in its entirety, the procedure is violative of due process. In Barry, even though the State held its post-deprivation hearings fairly promptly, because the penalty imposed (suspension of horse trainer for 15 days) was so short,

...it is as likely as not that Barchi and others

² It has been asked how the HPP differs from the appeals process for the halibut and sablefish ITQ program. The answer is that the latter is not "penal."

subject to relatively brief suspensions would have no opportunity to put the State to its proof until they have suffered the full penalty imposed.

Barry v. Barchi, *supra* at 66. See also, Lipke v. Lederer, *supra* at 561-62. Given the agency's experience under the existing VIP, it will almost certainly prove impossible to provide appellants a post-deprivation hearing within a year of the violation (*i.e.*, prior to completion of the follow-up "reward" fishery). Thus, even in the unlikely event that the practice of excluding offending vessels from a "reward" fishery held the same or next year survives facial due process examination, it probably will be held violative of due process as applied.

Administrative Procedure Act

Because the "reward" fishery exclusion provision of the HPP will almost certainly be viewed as a "sanction" of an existing fishing license, provisions of the APA also will require an administrative hearing prior to such exclusion.

Section 9(b) of the APA, provides in pertinent part:

...Except in cases of willfulness or those in which public health, interest, or safety requires otherwise, the withdrawal, suspension, revocation, or annulment of a license is lawful only if, before the institution of agency proceedings therefor, the licensee has been given --

- (1) notice by the agency in writing of the facts or conduct which may warrant the action; and
- (2) opportunity to demonstrate or achieve compliance with all lawful requirements.

5 U.S.C. 558(c) (emphasis added). It seems clear that a fishing permit issued pursuant to the Magnuson Act is a "license," and that its suspension or revocation under the HPP with regard to the "reward" fishery is both an act of "licensing" by the agency and a "sanction" within the meaning of the APA. See definitions at 5 U.S.C. 551(8), (9), and (10). The courts have interpreted the

³ 5 U.S.C. 551(8) provides that a "'license' includes the whole or a part of an agency permit, certificate, approval, registration, charter, membership, statutory exemption or other

definition of license included in the APA very broadly. Pan-Atlantic Steamship Corp. v. ATL Coast Line, 353 U.S. 436, 438-439 (1957); Air North America v. DOT, 937 F.2d 1427, 1437 (9th Cir. 1991); Atlantic Richfield Co. v. U.S., supra at 1200. The courts also have construed the prior hearing exceptions very narrowly, and have confined their application to "...unusual, emergency, situations." Air North America v. DOT, supra at 1437, n. 8. In considering the provisions discussed, above, one court has stated:

A paraphrase of the provision taken as a whole might read 'before an agency can institute proceedings to withdraw, revoke, etc., an existing license, it must provide the licensee with notice in writing of the offending conduct and a hearing at which the licensee can refute the charges.'

Bankers Life & Cas. Co. v. Callaway, 530 F.2d 625, 635 (5th Cir. 1976), reh. den. 536 F.2d 1387, cert. den. 429 U.S. 1073.

Magnuson Act/Regulations

Finally, the Magnuson Act, and the agency's existing procedural regulations, also will require that an administrative hearing be provided prior to exclusion from any "reward" fishery held pursuant to the HPP.

Under the provisions of the Magnuson Act, those who commit acts prohibited by the Act or its implementing regulations (see 16 U.S.C. 1857) can be subjected to any of four sanctions: 1) civil penalties pursuant to section 308 (16 U.S.C. 1858); 2) permit sanctions, also under section 308; 3) criminal prosecutions pursuant to section 309 (16 U.S.C. 1859); and 4) civil forfeitures pursuant to section 310 (16 U.S.C. 1860). These are the only sanctions expressly provided by the language of the Act.

The Supreme Court has held that "...penal statutes are to be construed strictly'... and that one 'is not to be subjected to a

form of permission."

5 U.S.C. 551(9) provides that "'licensing' includes agency process respecting the grant, renewal, denial, revocation, suspension, annulment, withdrawal, limitation, amendment, modification, or conditioning of a license." (Emphasis added).

See note 1, supra, for definition of "sanction."

penalty unless the words of the statute plainly impose it'" [citations omitted]. I.R.S. v. Acker, 361 U.S. 87, 91 (1959). See also, Key Bank of Washington v. Concepcion, 847 F. Supp. 844, 848 (W.D. Wash 1994); section 9(a) of the APA, 5 U.S.C. 558(b).

Applying this rule of statutory construction to an analysis of the sanction proposed in the HPP, it seems clear that unless the exclusion of a vessel from the "reward" fishery can be termed a permit sanction, any attempt to enact the HPP pursuant to the Magnuson Act will be ultra vires and thus illegal.

Assuming, therefore, that the sanction proposed in the HPP is in fact in the nature of a permit sanction, existing agency regulations very clearly lay out the procedural requirements that must be met before such a sanction can be made effective. See 15 CFR 904, Subpart D. The individual against whom a permit sanction is sought has a right to a hearing before an Administrative Law Judge (ALJ). 15 CFR 904.304(a). Although upon application to the ALJ, the agency may seek to have the permit sanction effective on an interim basis during the pendency of the litigation, the standards to be met for such an action are very stringent and are not likely to be met in the context of the HPP. 15 CFR 904.322.

Thus, one cannot assume that the agency will be able to exclude an individual vessel from any subsequent fishery until the offense has been investigated by the National Marine Fisheries Service (NMFS) Enforcement Division, then prosecuted by NOAA General Counsel. Such prosecution will not be final, and the permit sanction thus not effective, until "final agency action;" that is (assuming that the agency's determination is appealed), until the ALJ has rendered his decision. Under present staffing levels, the most optimistic

⁴ In order to have such a request for interim effect granted by the ALJ, the Agency must make a showing that there is probable cause to believe that the offense has in fact occurred, and that the offense was "willful" or that making the permit sanction effective immediately (before final agency action) is required in the interest of public health, welfare, or safety. Id. To my knowledge, such an agency request has never been granted by the ALJ.

⁵ It must be noted that the decision of the ALJ is subject to a discretionary appeal to the Administrator of NOAA, which would further delay the effective date of any permit sanction imposed by the ALJ. 15 CFR 904.273. In addition, such a "final agency decision" would be subject to an appeal to the United States District Court. Whether the court also would stay the effect of the agency's decision to exclude the appellant from any "reward"

estimate would be that an offending vessel could be excluded from a subsequent "reward" fishery no earlier than approximately two to three years from the date of violation.

cc: Jay S. Johnson
Margaret F. Hayes
Robert C. Babson
Steve Pennoyer

fishery held during the pendency of the District Court appeal is within the discretion of the court.

⁶ The experience under the VIP program has been even more protracted. The program is slightly more than three years old. To date, 4 prosecutions have been brought, one has settled, the other three have gone to hearing and are still pending before the ALJs. In short, only one prosecution has resulted in "final agency action."

► **Dr. James Wilen**

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Dr. Wilen

We received your analysis of the Chinook bycatch incentive plans. The primary purpose of this letter is to answer some of the questions raised in that document. The central issue is the following:

"The extent to which incentives bycatch can actually be reduced by behavioral and technological means." (Wilen p.2).

We have a quantitative estimate of the effect of the Financial Incentive Plan (FIP) derived from the experience of one vessel in the Catcher-Processor (CP) fleet which made a systematic effort to avoid Chinook bycatch. We also would like to bring you up to date with the changes made since the November draft you reviewed. We are taking this opportunity to better explain some of the aspects of the FIP that may have not changed since the November draft, but were inadequately described in the November paper. We comment as well on document "Financial Incentive Plan" (At Sea Processors, March 13, 2009) which was released after the date of your analysis.

We hope to communicate with you further on this matter. Our contact numbers are at the end of the letter. We appreciate the difficulty of your assignment, due to the very short time available. Your market-oriented perspective on fishery management comes as no surprise to us but we are gratified that it has not blown away in this year's zeitgeist.

This letter also provides an opportunity to comment on the decision of the Department of Agricultural and Resource Economics at the University of California, Davis to admit our co-author Ana, and to give her financial support. Ana became involved in this process only a couple of days after the conception of the central idea. Initially it was thought that Ana's contribution would be limited to statistical analysis and modeling. Although Ana had absolutely no qualifying experience beyond her studies at the University of Washington when the project began, within weeks she was a 100% contributing partner who materially influenced the design of the plan and in all phases of the analysis. Congratulations.

The FIP was designed to present all the pollock harvesters with the same marginal incentive to avoid salmon. This maximizes the number of salmon avoided at any given cost or minimizes the cost of any given reduction in bycatch.

Similarly, we have left Transferable Bycatch Allocations (TBA) perfectly tradable. Note that the FIP was designed to make the incentive to avoid Chinook bycatch highest in the years of lowest Chinook abundance which reflects the higher biological value of each Chinook when Chinook abundance is low.

Comments on the Efficacy of Incentives

Can Chinook Bycatch Incentives be Effective?

Our first comment will hopefully shed some light on a fundamental question that is central to any incentive-based attempt to reduce Chinook bycatch in the pollock fishery, which include FIP and SSIP, and any modifications that may be made to these programs.

You state (correctly in our view) that “A significant unknown is the extent to which bycatch can actually be reduced by behavioral or technological means”. (Wilen p.3).

This is a serious issue. If bycatch is a “rare and random event”, any program of bycatch incentives would be no more effective than jailing TV weathermen as a disincentive for inclement weather. We provided no quantification of expected reductions in bycatch in the November paper because at that time we had no evidence regarding the slope of the marginal cost of avoidance curve. We have since uncovered evidence that allows for an estimate of the cost of avoiding Chinook. This is derived from the activities of a single vessel in the factory trawler fleet.

A total of seventeen catcher processor vessels participated in the pollock fishery during the years 2000-2007. These vessels are all of similar size, produce the same finished products, use the same type of fishing and electronic gear, and operate on the same grounds. Fourteen of these ships participated in all years. We constructed a table that included only those fourteen vessels along with their harvests of pollock and Chinook. This allowed us to express the history in units of relative bycatch (Vessel BCR / Mean BCR).

Table 1. Relative Bycatch Rates in the Catcher Processor Fleet, 2000 – 2007.

Year	2000	2001	2002	2003	2004	2005	2006	2007	Vessel Mean	St. Error of Vessel
BCR (n / 100 mt)	0.7	3.4	1.7	2.9	2.1	2.7	3.2	6.3		
Vessel										
Highland Light	0.62	0.52	0.45	0.84	0.59	0.39	0.47	0.53	0.55	0.049
Arctic Fjord	0.37	2.34	1.31	1.16	1.42	0.91	0.81	0.97	1.16	0.204
Arctic Storm	0.31	0.59	1.00	0.65	1.13	0.79	0.99	1.28	0.84	0.113
American Triumph	1.94	0.45	0.31	1.02	1.64	1.68	1.18	1.10	1.17	0.205
Northern Eagle	1.08	0.60	0.87	0.95	0.61	0.95	1.22	0.92	0.90	0.074
Northern Hawk	1.30	0.75	0.59	1.10	1.38	1.50	0.71	0.87	1.03	0.121
Northern Jaeger	1.27	0.64	0.51	0.92	0.54	0.81	1.29	0.87	0.86	0.106
Ocean Rover	0.40	0.41	1.01	0.63	0.77	0.74	0.70	0.72	0.67	0.070
Alaska Ocean	1.52	0.57	2.37	0.95	0.93	0.38	0.54	0.84	1.01	0.230
Northern Glacier	2.45	0.58	0.62	1.17	0.93	1.04	1.03	1.59	1.18	0.214
Pacific Glacier	1.62	0.54	0.86	1.01	0.85	0.72	0.84	0.94	0.92	0.112
Starbound	0.40	1.38	1.25	0.96	0.85	1.18	1.40	1.25	1.08	0.119
Island Enterprise	0.62	2.22	0.90	1.66	1.54	1.53	2.10	1.17	1.47	0.196
Kodiak Enterprise	0.59	2.29	2.13	1.29	0.75	1.28	0.95	1.40	1.34	0.216
								Mean	1.01	0.145
								St.dev.	0.25	

Overall Standard Deviation 0.48

A = Standard Deviation of Vessel means 0.25

B = Overall Standard Deviation with CLT adj (n = 8) 0.17

Ratio A/B 1.45

In the years 2000 – 2007, the vessel Highland Light had the lowest relative Chinook bycatch rate (BCR). In a personal conversation (March 19, 2009) with Michael Coleman, the General Manager of the Highland Light, Mr. Coleman said that the corporation made Chinook bycatch minimization a primary operational objective in all

years. The principle techniques used to reduce bycatch were choosing clean fishing grounds, moving away from areas where bycatch was high, and avoiding October fishing. The Highland Light's eight year average relative BCR was 55% of the 14 vessel CP fleet average. This is 2.6 (Central Limit Theorem) standard deviations below the fleet mean. This vessel had relative BCR below the fleet average in all eight years. This implies that there is a 1/256 chance that the Highland Light's performance resulted from luck, leaving a 255/256 chance that the vessel's superior performance was a result of a successfully executed operational plan.

Mr. Coleman kept no accounting records regarding the vessel's avoidance costs, but said that he was sure that those have never exceeded \$100,000 in any given year. If the Highland Light had fished at a BCR equal to that of the fourteen vessel fleet in all of these eight years, it would have bycaught an additional 2,925 Chinook. This, along with Mr. Coleman's estimate of avoidance, allows a conclusion that the average cost of avoiding Chinook was less than or equal to \$273.50 / Chinook. Assuming that the marginal cost of avoidance is linear and that \$100,000 was spent, we estimated the average marginal cost of avoidance faced by the Highland Light at \$547 per Chinook. The vessel's actual reduction in the relative BCR was 45%. We are aware of plenty of reasons for the reduction in BCR could be expected to be greater if the fleet as a whole was provided with a simple fixed \$547 per Chinook incentive and some reasons for supposing that it would be less.

In 2004, the Highland Light had a BCR which was 41% below the 14 vessel mean BCR. As a result, the Highland Light caught 268 Chinook fewer than if it had had a BCR equal to the average catcher processor. Assuming that the Highland Light spent \$100,000 to avoid salmon, each salmon avoided cost on average \$373. If the marginal cost was twice the average cost, then the marginal cost of each avoided salmon was \$746. There was no FIP in 2004, but the desires of the Highland Light's management made it expend significant resources to avoid salmon. If there had been a FIP in 2004 with \$22 ante per ton of pollock (\$0.01 / lb of pollock), the marginal incentive provided by the FIP for a catcher processor to avoid Chinook would have been \$858. A \$746 marginal incentive to avoid Chinook salmon could have been provided by an ante of \$19 per ton of pollock.

The experience of the Highland Light indicates that an ante of \$0.01 per pound of pollock would reduce Chinook bycatch substantially, perhaps by about half, so long as fishing companies are profit maximizing enterprises.

Over what Range of Bycatch can Incentives be Effective?

There has been some discussion during this process of the existence of a bycatch boundary, below which Chinook encounters are entirely random events. It has been asserted that the FIP, when applied to a fleet that is operating below this boundary, is reduced to a system of forced gambling, with no impact whatsoever on actual bycatch. *"When salmon abundance on the grounds is at very low levels, incentive based programs to avoid salmon bycatch can become little more than programs which assess a per-salmon fee for random salmon bycatch."* (Chinook PPA Inter-Coop Agreement, p.A13).

A variety of "solutions" have been proposed for this problem which include canceling the FIP and returning antes when bycatch falls below a certain level. These solutions are not part of any currently active proposal, however the assertion the FIP does nothing at very low abundance levels is serious enough that we believe that the data should be examined for supporting evidence.

“When salmon abundance is less than two salmon per 100 tons of pollock, it becomes doubtful that current technologies and methods available to discover and avoid salmon concentrations continue to work well. This places a practical limit on the ability of the pollock industry to avoid salmon when their abundance is very low.” (Chinook PPA Inter-Coop Agreement, p.A13).

Looking at Table I above, we notice that the Highland Light managed to have a low relative BCR both when average BCRs were high and when they were low. In fact, in 2000, 2002, and 2004 when the average BCR was lowest, ranging from 0.7 to 2.1, the relative BCR of the Highland Light was almost exactly the same as in the other five years when BCRs were higher, ranging from 2.7 to 6.3. In fact, there is a smidgen of evidence for deterioration in the ability of a vessel to avoid bycatch in years of low Chinook abundance. The relative BCR of the Highland Light in the three low bycatch years was 0.55442. In the high bycatch years the relative BCR of the Highland Light was 0.55264. The ratio of the relative BCR between the two sets of years is 99.7%. This is strong evidence that using historical data on the location and timing of bycatch vessels can avoid large percentages of Chinook bycatch even in years of low Chinook abundance.

The Role of the TBA in the FIP

The FIP was conceived of and designed specifically to provide an incentive that would act in concert with a TBA. The FIP is a complement to, not a supplement or substitute for, the TBA. We assume the existence of a TBA that allocates to the vessel level, and that these allocations are fully transferable between vessels, sectors and seasons without restrictions of any kind. We did not include a section describing the benefits of TBA in our paper because it was our impression as early as last May that both the industry and the regulatory community were in near-consensus that this was the efficient way to limit the maximum bycatch in years when bycatch is relatively high. It was evident even before the statistical analysis provided in the November draft that the TBA would not provide significant incentives for the avoidance of Chinook bycatch in years of low abundance. It was our impression that the Council, biologists, and those interested in Chinook conservation were looking for a program that would provide significant incentives when salmon abundance and hence bycatch was low.

In our scheme, the TBA provides the great majority of the incentive when bycatch is high. The FIP provides the incentive when bycatch is low. (See Kochin et.al., pp.15-20, Appendix pp. 59-78).

In common usage the term TBA has come to include a wide variety of Hard-Cap systems. As it is used by us, it means Fully Transferable and Allocated to the vessel level. Efficiency requires equalization of marginal costs. Impediments to transfer and central control impede marginal cost equalization and so are enemies of efficiency.

The PPA required a comparative analysis of:

1. A 47,591 Chinook hard cap (which we assumed would be a TBA) against
2. A 68,392 Chinook hard cap (which we again assumed to be a TBA) along with an incentive program.

The first step in that analysis was a quantitative comparison of the incentives provided by the 68,392 cap versus the 47,591 cap across the range of bycatch rates that could be anticipated. We approached this from the demand side, by modeling expectations as to the probability that TBA would have *any* value at the end of the fishing period along with the probable value of TBA *if* it had any value at all. This value was set at the lease value of the amount of pollock that would most likely be harvested as a result of purchasing the right to bycatch one additional Chinook

when the hard cap was limiting the pollock harvest. We chose the demand side approach over the supply side approach because we had access to pollock quota lease prices. The conclusions are presented graphically in the November draft on pp. 15-20. The model is described in Appendices C-F.

Not surprisingly, this analysis shows that the incentives induced by the TBA declined significantly with declining bycatch rates. Figure 3 on page 16 in the November draft shows that there is very little difference in the predicted incentive at bycatch rates below 20% of the mean BCR experienced over the last 8 years, as even a cap of 32,482 Chinook induces a marginal value approaching zero in this range.

We believe that figure 3 accurately depicts the marginal values induced by TBA. This is not to say that it accurately depicts the ability of the TBA to discourage bycatch at Chinook abundance levels significantly below the maximum bycatch level that is possible under the hard cap. We contend that the ability of the TBA is much weaker than marginal values depicted here alone indicate. We will show later that the marginal costs of avoidance are rising hyperbolically as the marginal value of avoided fish declines in response to decreasing abundance under TBA alone.

We believe that the lesson to be drawn from figure 3 is that a TBA, by itself, even without taking into account the increased avoidance costs at low abundance levels that we claim, cannot discourage the bycatch of Chinook when their abundance is at run-threateningly low levels, without imposing enormous pollock stranding losses on the industry in years of normal Chinook abundance. Conversely, a TBA that does not impose significant stranding losses on the industry in years of normal Chinook abundance cannot, by itself, protect the Chinook resource during times of maximum vulnerability.

The Marginal Value of Bycatch Avoidance over Different Bycatch Conditions under the FIP

“As a result, the FIP prize structure generates a marginal value of bycatch avoidance that is constant (once the ante structure is determined) over all different bycatch conditions. Thus there is always a consistent inducement to avoid bycatch under both high and low abundance conditions with FIP.” [Emphasis added]. (Wilens, p.16).

We respectfully disagree. It is our contention that the marginal value of an avoided salmon is a function of the inverse of the prevailing bycatch rate and therefore rises hyperbolically as the bycatch of a fleet operating under the FIP approaches zero. We believe that it is this characteristic that makes the FIP an effective complement to a TBA.

The average value of an uncaught fish (UCF)¹ is the total ante divided by the number of UCF. The ante is independent of the bycatch rate as it is based on pollock quota. Holding pollock quota constant, the average value

¹ The number of uncaught fish is determined by the difference between the mean fleet bycatch rate (MBCR) and the reference bycatch rate (RBCR) (the BCR formerly established by Dirty Harry). This undercatch rate (UCR), when multiplied by the pollock harvest, yields the number of uncaught fish. The number of UCF can be calculated as follows:

$$UCF = CF \times (RBCR / MBCR) - I$$

is entirely dependent upon how many (or few) uncaught fish there are. The ratio of UCF to bycatch is relatively constant across the range of bycatch experienced, so the average cost is a function of the inverse of the bycatch rate, causing the average cost to double along with each halving of the bycatch rate, thereby tracing a hyperbolic curve that approaches infinity as BCR approaches zero.

The marginal value of an UCF is equal to its average value for participants holding small shares of the total UCF. For participants holding large shares of the total UCF, marginal values of UCF are lower than average values. A discussion of the effects of market share of UCF is done just the way we would say it in Section V, pp.A7 - A10 of Chinook PPA Inter-Coop Agreement. A mean-bycatch based reference would be ideal for a fishery where no one firm had any market share. Unfortunately, in the CP sector there are only 5 firms, and one of those firms holds nearly 50% of the pollock quota. That large firm would have 50% control of the reference point and so would face marginal incentives very different from other firms even if the market share adjustment discussed in the Chinook Inter-Coop Agreement is implemented. The use of the average as a base for the reference BCR provides an incentive for gaming for a firm with significant pollock market share. Because of this, we elected to use another measure of central tendency - the median vessel bycatch rate at the end of the season - as the basis for the reference point. The reference BCR is set equal to 2.5 times the vessel median BCR. The disadvantage of this is that the median BCR is not a perfect proxy for the mean BCR. The ratio median / mean of relative bycatch rates in the years 2000-2007 is 0.88, with a standard deviation of 0.12. We believe this is sufficiently stable for the purposes at hand.

On the basis of the above, we believe that the number of uncaught Chinook is a nearly constant multiple of the number of bycaught Chinook. The marginal value of avoidance is essentially equal to the average value of avoidance once the market share adjustments are implemented. So the marginal value of avoidance increases hyperbolically with reductions in bycatch. If bycatch is reduced by incentives, that will result in an increase in the marginal value of avoidance incentives provided by the FIP and a fall in the marginal value of avoidance incentives provided by the TBA.

The Marginal Cost of Bycatch Avoidance over Different Bycatch Conditions under the FIP

*“When salmon abundance is low, there is the simultaneous coincidence of low encounter rates with high vulnerability for Salmon populations. **Low encounter rates make it easier to avoid salmon**, but those that are caught may have a higher impact on population viability.” (Wilén, p.6).*

We contend that the marginal cost of avoidance rises as a function of the inverse of the bycatch rate, which is to say, like the marginal incentive under the FIP, the cost of avoiding a salmon rises hyperbolically along with decreasing salmon abundance.

For example, when $RBCR = MBCR$, $UCF = 0$ as there are as many negative uncaught fish as caught fish when $RBCR = 2 \times MBCR$, $UCF = CF$. If the reference point could be set as a multiple of the MBCR, the marginal value of an UCF could be predicted perfectly by the bycatch rate, the pollock harvest, and the total ante. Under such an arrangement, the marginal value would obviously increase hyperbolically as bycatch approaches zero.

All Chinook avoidance methods can be classified into three categories:

1. *Changing where fishing occurs*

In the November paper, we showed that the cost per avoided fish of moving a vessel between different grounds to avoid Chinook rises as abundance falls. Examples 1-5 in the November paper (pp. 20, 24) illustrate the relationship between the marginal cost of avoiding Chinook, bycatch rate, and choice of fishing location.

2. *Changing when fishing occurs*

The decision on when to fish has a large impact on bycatch. The “B” season fishery occurs from June through October. June bycatch rates are consistently less than 10% of October bycatch rates. Because of physiological changes that occur on an annual cycle, pollock are more valuable in October. Pollock contain more roe, more oil, and more muscle per metric ton of catch in October than in June. From factory production reports from Trident’s Akutan plant, the value of these increases is \$132/mt. If during June, a vessel can earn more than \$132/mt from incentives related to salmon avoidance it will be inclined to shift fishing effort from October to June.

If the bycatch rate in October is 80 Chinook/100 mt of Pollock (as in 2007, see Figure 2, p.9 of the November paper) and the bycatch rate in June is 8 Chinook/100 mt of pollock, then the differential is 72 Chinook/100 mt of Pollock. The cost of avoiding 72 Chinook using this method is \$13,200. The cost of avoiding one Chinook is \$183.

If the bycatch rate in October is 10 Chinook per 100 mt of Pollock (as in 2003) and the bycatch rate in June is 1 Chinook per 100 mt, the differential is 9 Chinook / 100 mt. The cost of avoiding 9 Chinook using this method is $100 \text{ mt} \times 132 \text{ \$/mt} = \$13,200$. The cost of avoiding one Chinook is \$1,466.

In the examples above, Chinook bycatch fell by a factor of eight. The cost per avoided Chinook rose by a factor of eight.

3. *Changing fishing techniques*

The capital costs associated with a salmon excluder are about \$10,000, trivial compared to the magnitude of incentives being discussed here. The salmon excluder is really a fish excluder that is more effective in excluding salmon than pollock. The vast majority of the costs are operational and associated with reduced pollock harvest per unit of time. This results from pollock escaping through the tunnels or flaps along with the salmon, as well as reduced pollock capture rate during periods when the towing speed is reduced to allow the salmon the opportunity to escape. The costs of this lost pollock harvest are the fuel, vessel and gear wear etc., that are needed to replace the lost pollock harvest. The loss of pollock-harvest effectiveness is unrelated to the number of Chinook that are in the net. The hourly operating costs are constant with respect to bycatch rate; the hourly salmon avoided are directly proportional to the generally prevalent bycatch conditions. The cost of avoiding a salmon doubles when the encounter rate is cut in half so the cost of avoiding a Chinook with an excluder is inversely proportional to the bycatch rate that is prevalent at the time, and so will follow the hyperbolic path described above. See Examples 8-1, pp. 26-28 of the November paper.

A quantitative estimate of the effect of the FIP:

“The FIP pins down prices with certainty (and hence the magnitude of the incentives that will be created)—but bycatch quantities are hard to predict.” (Wilén, p.15).

In our November paper we made no effort to provide a quantitative estimate of the magnitude of the *effect* of the incentives provided by the FIP. In order to provide such a quantitative estimate we would have to have had *either* the results of a prior incentive program or systematically compiled data on the cost of avoidance. We had neither. Recently, we received information on a large scale bycatch reduction “experiment” provided by the Highland Light operating from 2000 to 2007. The Highland Light management emphasized Chinook bycatch avoidance. They informed us that they spent a substantial sum, but not more than \$100,000 per year, avoiding Chinook bycatch. The Highland Light had a BCR of 52% of the BCR of the other vessels in the CP fleet which operated in all eight years. These two bits of data enable us to estimate the average cost of avoiding Chinook bycatch. Our estimates of bycatch reduction are based on the activities of one vessel. However, this is a very large scale experiment done over a long period of time:

- Eight years of fishing (2000-2007), 16 fishing seasons
- 222,475 tons of pollock harvested
- Over 2,500 tows
- 3,548 Chinook bycaught
- 3,275 Chinook avoided that would have been caught at the BCR of the rest of the CP fleet
- Below average BCR in all eight years
- 48% reduction in bycatch over eight years
- Greater than 99% confidence that the Highland Light’s expected annual BCR was below that of the other vessels

In order to estimate the average cost of salmon avoided in 2004, we subtracted the Highland Light’s BCR in 2004 from the BCR of the other vessels in 2004 and multiplied that by the Highland Light’s Pollock catch in 2004. This gave us the number of Chinook avoided by the Highland Light in 2004 (namely 271). Dividing \$100,000 by 271 gives us the average cost per Chinook avoided in 2004 (namely \$370).

This average cost differs sharply by year. In 2000, when bycatch was the lowest, our estimate of the average cost of avoiding a Chinook is more than three times as high as in 2004 when the bycatch was somewhat lower than average. In 2007, when bycatch was the highest, our estimate of the average cost of avoiding a Chinook is more than two times as low as in 2004 when the bycatch was somewhat lower than average.

If the marginal cost increases linearly with the percentage of bycatch avoided then the marginal cost of avoidance will equal twice the average cost of avoidance. Using this assumption, the marginal cost of the Highland Light in avoiding Chinook in 2004 was \$740. Our estimate of the marginal value to avoiding salmon under the FIP program given the bycatch in 2004 was \$910. However with incentives provided bycatch would have been considerably lower and therefore the marginal value provided by the FIP would have been considerably higher. Such increases in the marginal value would have taken us too far out of the observed range of the marginal cost. So we will use an estimate which is 23% higher than the observed avoidance of the Highland Light.

Our point estimate is that in 2004 the Highland Light avoided 271 Chinook salmon which is 45% of the Chinook it would have been expected to catch if its BCR was equal to the BCR of the CP fleet. However, this estimate is subject to sampling error. As we showed in Table I, the uncertainty about the average relative BCR estimate is 0.049. Therefore, the uncertainty about the number of Chinook avoided is also 0.049 times the average BCR. There is a 95% chance that the expected percentage of bycatch avoided by the Highland Light was higher than 35% and lower than 55%. So there is a 5% chance that the expected number of Chinook avoided by the Highland Light in 2004 was lower than 210 or higher than 329. Since the FIP, under the conservative conversion assumption made

earlier, would have led to 23% more avoidance of Chinook than was achieved by the Highland Light, the expected number of Chinook avoided by a vessel with the quota of the Highland Light is 333. There is a 95% chance that the FIP would have induced the avoidance of at least 258 Chinook by a vessel with the quota of the Highland Light. Since the total CP sector had a pollock quota 22.6 times as large as the Highland Light's quota, the number of Chinook avoided by the sector would have been at least 5,830.

In Table 2, we show the effects of incentives provided by the FIP on Chinook bycatch. These estimates of bycatch reduction are conservative because we have not included any increase in incentives provided by industry bycatch reduction and have used a low estimate of the percentage bycatch reduction achieved by the Highland Light. No allowance is made for any incentives provided by TBA.

Table 2. Estimate of Chinook Saved Under the FIP for the CP Fleet, 2000 – 2007.

Year	Pollock Harvest (1000 mt)	Chinook Bycatch Actual	Chinook Bycatch High Estimate	Chinook Saved Low Estimate	Percent Reduction
2000	491	3,093	1,790	1,303	42%
2001	604	18,127*	10,488	7,639	42%
2002	644	10,867	6,288	4,579	42%
2003	694	18,472	10,688	7,784	42%
2004	677	13,781	7,951	5,830	42%
2005	678	15,764	9,121	6,643	42%
2006	680	18,857	10,911	7,946	42%
2007	630	35,091	20,304	14,787	42%
Total		115,925	77,541	56,511	
Avg.					42%

*Chinook bycatch in excess of CP share of 47,591 Chinook

The CP and CDQ share of TBA is 34.3%. For the CP and CDQ sectors this gives a hard cap of 16,326 Chinook with a 47,591 overall hard cap. Only in 2007 would the FIP alone have failed to keep Chinook bycatch below 16,326 even under these very conservative estimates of the effects of the FIP. With an overall hard cap of 68,392 Chinook, the CP and CDQ sectors share of TBA is 23,458. The FIP alone would have sufficed to keep Chinook bycatch below the hard cap. However, the shadow of the hard cap would probably provide substantial additional incentives to avoid bycatch in a year with a natural bycatch rate equal to that in 2007.

We conclude that at a minimum, the FIP will reduce Chinook bycatch across the entire range of abundance seen in the years 2000-2007 by 42%.

Short Comments

Wilén, p.7. *“The FIP most closely resembles what economists have called ‘tournaments’.”*

Under the revised FIP with the revision in reference point, the market share adjustment, and the penalty for being above the reference point, all participants face essentially equal marginal values for avoiding Chinook.

Wilén, p.16. *“The FIP prize structure generates a marginal value of bycatch avoidance that is constant.”*

As discussed above, the FIP generates much greater incentives at low levels of Chinook abundance.

Wilén, p.17. *“Both programs will (ultimately) bring bycatch down to 47,000 on average.”*

55,828 was the average bycatch in the past eight years without any incentives in place. Our high estimate for the average bycatch in the CP sector is 9,692 Chinook. For the whole Bering Sea pollock, Fishery our high bycatch estimate is 28,256 Chinook assuming that the FIP is applied to and has equal effects on all sectors.

Additional Research Needs

1. Using existing data to gather information on the relationship between Chinook abundance and Chinook bycatch rates.
2. Finding which additional data if collected could significantly improve estimates of the biological, subsistence, recreational, and commercial fishing value of Chinook salmon over time and over bycatch location.
3. With estimates of abundance apart from bycatch rates the effectiveness of incentive programs could be tracked.

Offer of Further Discussion

We would be happy to discuss this letter with you further individually or preferably in a conference call. Our contact numbers are:

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Sincerely Yours,

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