

## **Analysis of the Use of Processing and Harvesting History in the Allocation of Pacific Whiting Quota**

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### **Abstract**

The purpose of this paper was to define the economic context of the decision facing the Pacific Council and the Secretary of Commerce concerning the re-examination of the dates that define the period of history that were used for the allocation of quota in the Pacific whiting fishery. We begin with a contrast between the performance of derby fisheries and rational fisheries; it is shown that the theoretical economic predictions and empirical observations in actual fisheries are in substantial agreement. The evidence shows that the problems associated with derby fishing are real and the solutions promised by catch share programs have been effective in addressing those problems.

We then move to the central problem of the evolution between derby and rational fishery operations. The problem is how to affect a rational allocation that is fair and equitable to both those receiving quota privileges, and the society that is the owner of such privileges, when the first move towards rationalization potentially causes the “race-to-fish” of a derby fishery to accelerate into a much more intensive and fundamentally more dangerous race-to-fish for quota. We demonstrate how such a race destroys wealth in much the same process that causes derby fisheries to consume the economic potential of a fishery. This example also demonstrates the fact that Pacific whiting is particularly vulnerable in both a biological and an economic sense to a race-to-fish for quota. We include a discussion of control dates the impact they have on expectations of those making investments in the industry.

We examine the fundamental rationale for allocations of quota to the owners of fishing vessels and processing plants as opposed to the general public and describe why, in capital intensive fisheries like Pacific whiting, allocations to such private entities is necessary to compensate them for the loss of value their capital investment suffer when a fishery is rationalized.

Given the rationale for allocations to private entities, criteria are developed to describe the quality of the investments made by the industry for purposes of determining those investments which most warrant allocations of quota. The criteria focus on the investment's benefits to society and the reasonable expectations of those making the investments. Using these criteria, we examine investments made in the Pacific whiting fishery.

### **I. Rational, Derby and License Limitation Fishery Management**

Rational, derby and license limitation management systems are distinguished by the method by which the resource is allocated among its users. In rationalized,<sup>1</sup> or catch share management, the available fish are allocated between the users, usually in units of a percentage of the Total Allowable Catch (TAC). In derby fisheries the users compete for a share of a common pool of fish during a fishing season that begins on a certain date and ends when the biologically optimal amount of fish (TAC in the case of Pacific whiting) has been taken. License limitation fisheries are a hybrid between these two systems where the number of vessels participating in the derby is limited by a fixed number of permits in an attempt to prevent the overcapitalization that occurs in derby fisheries. License limitation was once thought to be a complete solution to the entry-driven dissipation of rents. However license limitation does not address the overcapitalization that has already occurred when the program is initiated, nor can it prevent the entry that occurs through "capital stuffing," i.e., increase in fishing vessels' capacity when the total number of vessels is fixed through such techniques as better fishing gear, increasing engine power, better electronics, expanding the width and depth of a vessel, etc. Groundfish trawl fisheries managed under license limitation have operated essentially as derby fisheries.<sup>2</sup> They are of interest here due to the fact that the Pacific Whiting fishery was managed under a license limitation system since 1994 through 2012.

It is now widely believed that derby fisheries substantially under-perform rationalized fisheries in every relevant criterion by which performance can be measured. These include: conservation of the resource, gross value extracted from the resource, cost of harvesting and processing the resource, managing bycatch, difficulty in controlling effort and safety at sea. Derby fisheries systematically destroy the ability of society to collect net benefit (rent) from the fisheries it owns and manages.

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<sup>1</sup> We define "rationalization" as "privatizing the privilege to utilize fishery resources." We also used the terms "rationalization" and "catch share" interchangeably in this paper.

<sup>2</sup> Wilen, James, *Limited Entry Licensing: A Retrospective Assessment*, Marine Resource Economics 5(4), 313-324 (1988).

The root cause of these shortcomings is the fact that no one is providing, for the resource itself, the services that are provided normally provided by an owner. There is no price paid for the fish. This results in a dissipation of rent from fisheries managed under a derby.

The theory that overcapitalization and the tendency toward overfishing could be cured through sole ownership of the fishery and privately owned fishing vessels was first proposed by Anthony Scott in 1955.<sup>3</sup>

### **Dissipation of Rent: The Problem with Derby and License Limitation Management**

There are three economically driven mechanisms involved in the dissipation of rent. These are:

- Overcapitalization
- Intensive operation
- Underinvestment in conservation

#### 1. Overcapitalization.

Overcapitalization is a process that is first outlined in Gordon 1954<sup>4</sup> and succinctly described by Crutchfield and Pontecorvo in 1969.

The economic analysis follows directly from the traditional exposition of the firm. ...[F]or any resource which is not owned and there are no barriers to entry, average cost rather than marginal cost will be equated with price; infra marginal rents will be dissipated by the creation of excess capacity.<sup>5</sup>

A simple example of overcapitalization is as follows: Imagine a fishery that is fished at the maximum sustainable yield, and produces one 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 derby fishery 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, the fishery managed by a derby becomes a net cost to society.

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<sup>3</sup> Scott, Anthony, *The Fishery: The Objectives of Sole Ownership*, Journal of Political Economy 63, 2, 116-124 (April 1955).

<sup>4</sup> Gordon, H.S., *The Economic Theory of a Common-Property Resource: The Fishery*, Journal of Political Economy 62, 124-142 (April 1954).

<sup>5</sup> Crutchfield, J. A., and Pontecorvo G., *The Pacific Salmon Fisheries: A Study of Irrational Conservation*, 32 (1969).

In order to limit the entry of capital into a fishery, a license limitation program is frequently the first step managers take in attempting to organize the industry in such a way so as to limit the flow of resources into the fishery, thus creating conditions that allow the fishery to produce some benefit to society. To the extent that the marginal cost of adding capacity by capital stuffing exceeds the marginal cost of doing so through the entry of additional vessels under the license limitation program, less than all of the potential rent is dissipated through investments in capital equipment. This will be reflected through a positive permit price, an increase in fishing intensity and hence cost of fishing, or both.

## 2. Intensive Operation.

When the primary method of capital infusion into a fishery (i.e., entry of vessels) is cut-off, and profitable opportunities for capital stuffing have already been exploited, the primary competitive tactic of fishermen becomes the operational aspects of fishing (or processing). When the capital portion of the production function is constrained, the marginal product, or the amount of additional fish that will be caught for an additional dollar of investment in capital is low, which is another way of saying the cost of increasing harvest by one ton per day using additional capital is very high.

This is referred to as the “race-to-fish,” which differs from vessel entry and capital stuffing in that it does not involve any capital investment. This lack of capital investment is not in and of itself of much significance; however, it does affect the reliability of any estimate of stranded capital that uses changes in harvest rates as a proxy for capital investment. The race dissipates rent in two ways: (1) It can increase the cost of operation both on a per day and a per ton basis; and, (2) decreases the value and quality of the products produced, as suboptimal schools of fish are targeted and a suboptimal product mix is produced with less than the optimal amount of time dedicated to production. Raw fish itself is used as a substitute for other factors of production, leading to lower finished product recovery (or yield). Safety is also necessarily sacrificed to some extent. Nobel Prize winning economist George Stigler describes this as “[t]he least cost combination of inputs is achieved when a dollar's worth of any input adds as much value as any other input.”<sup>6</sup>

When capacity enhancement is very expensive using capital and raw fish are free the result is the substitution of raw fish for capital in the production function and a waste of the resource.

The amount of capacity enhancement, as reflected in daily catch rates that can be traced to purely operational decisions in harvesting and processing, as well as some concept of the magnitude of the societal loss these operational methods is provided by Wilen and Richardson, who documented the operational changes, and the effect on output of finished products during the first year of rationalization in the Alaska pollock factory trawler fleet. This article documents the changes that occurred between the last year of derby fishing and the first year of operation under the American Fisheries Act.

New rents were generated by tuning the fishing operations and coordinating harvesting operation with the onboard processing plants. In the initial year of cooperative fishing,

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<sup>6</sup> George Stigler, *The Theory of Price*, 14 (1969).

daily catch rates were only 40 percent of those recorded by the same vessels over the 1995-1998 seasons. Catch per haul was 27 percent lower and the number of hauls per day dropped by 45 percent. The length of the 1999 A-season was doubled compared with the 1998 season because of these substantial reductions in daily catch.

[In the last year] before cooperative fishing, total product recovery rates averaged 19.5 percent. In the first year of cooperative fishing, total product recovery shot up to 24.6 percent, exceeding the increases anticipated by most knowledgeable factory managers.<sup>7</sup>

Silvia *et al.* conducted a similar study of the Pacific Whiting catcher processor fleet documenting the rapid transition that occurs from a race-to-fish regime to a rationalized fishery.

The PWCC agreement also resulted in significant improvements in product recovery or yield, producing more food from each pound of fish landed. Product recovery rate or yield is the ratio (expressed as a percentage) of the weight of raw processed product relative to landed product. Prior to the formation of the cooperative, catcher-processors achieved on average a 17.2 percent yield in surimi operations. In 1998, the first full year under the harvest cooperative, catcher-processors were achieving an average yield of 24 percent. Based on 1998 landings, this equated to over 10 million more pounds of food from the same number of fish (APA, 2003). While engaged in the "race for fish," vessels had prosecuted the fishery at the highest possible speed without taking the time to consider product quality or output quantity. Inferior quality and low product recovery rates were simply necessary trade-offs given the time constraints of a race-for-the-resource management system. Rationalizing the fishery allowed the vessels to prosecute the fishery at slower speeds and choose the time and location of fishing that would optimize returns. It allowed fishers to search for schools of larger and higher quality fish that generated higher yields than smaller fish (APA, 2003). It also motivated vessel owners to invest in equipment that would improve product yield and quality rather than simply maximize capacity for rapid throughput.<sup>8</sup>

The differences here are not trivial. The differences in yield indicate that the race-to fish induced the industry to waste 1.7 pounds of raw fish per pound finished product. The ten million pounds of additional product produced by the cooperative would have a value \$10,580,000 per year at current Pacific whiting surimi prices.

### 3. Under-investment in conservation.

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<sup>7</sup> Wilen, James, and Richardson, Ed, *Rent Generation in the Alaskan Pollock Conservation Cooperative*, FAO Technical Paper, 504 Case Studies in Fishery Self-Management (2000).

<sup>8</sup> Silvia, G., Munro Muin, H., and Pugmire, C., *Achievements of the Pacific whiting conservation cooperative: rational collaboration in a sea of irrational competition*, FAO technical paper 504, Case Studies in Fishery Self-Management.

The third, and potentially most damaging, mechanism through which a derby fishery destroys wealth is that it provides economic incentives that can, and do, lead to the destruction of the resource upon which the fishery is based. This is consistent with both microeconomic theory and numerous empirical studies.

Derby fisheries provide insufficient incentives for conservation on the part of the industry.<sup>9</sup> In a situation where it is desirable to temporarily reduce the catch in order to facilitate a large increase in the annual harvest at some time in the future, existing fishermen often resist the conservation programs on perfectly rational grounds. While they must bear the entire cost of the reduced landings, they are forced to share the benefits of such a conservation program with the owners of however much additional capital that enters the fishery to share in the increased quota made possible by the investment in conservation.

Imagine a shrimp fishery that had 100 boats in an open access equilibrium harvesting ten million pounds of shrimp per year. Suppose the fishery managers proposed a two-year closure after which, when the fishery re-opened, the TAC would double. Even if the fishermen had 100% confidence the TAC would double after the two-year closure, they would likely oppose this proposal because they would know that the additional ten million pounds of shrimp would attract 100 additional boats. They would pay all the costs of the conservation effort, yet the benefits of that effort would be shared with the new boats, leaving them no better off than they were before they "invested" in the conservation effort. In fact, they would be worse off if you account for the cost of conservation. Two of the authors here used the term "Rational Myopia" to describe and explain the apparent paradox of the fishing industry opposing fishery conservation in a 1994 presentation to the Western Economic Association.<sup>10</sup> The industry's rational hostility toward conservation promoting regulation is translated through a process well documented by Stigler,<sup>11</sup> Buchanan and others. It is referred to as "regulatory capture,"<sup>12</sup> where the political process delivers a regulatory policy that is tailored to the economic interests of the regulated. When these interests are the necessarily short-term concerns of an industry regulated under a derby fishery, the results can be catastrophic for the resource.

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<sup>9</sup> <http://www.economist.com/node/21548240>, <http://www.economist.com/node/21548212>, The Economist, Feb 2012. See also, Costello, Christopher, *et al.*, *Can Catch Shares Prevent Fisheries Collapse?*, Science 321, 1678 (2008).

<sup>10</sup> Kochin, Levis A. & Riley, Christopher C., *The Changing Political Economy of Fishing: Efficient and Expedient regulation under ITQ and Open Access*, Western Economic Association Annual Meeting (July 1994).

<sup>11</sup> Stigler, George J., *The Theory of Economic Regulation*, The Bell Journal of Economics and Management Science Vol. 2, Issue 2, (1971).

<sup>12</sup> Dal Bo, Ernesto, *Regulatory Capture: A Review*, Oxford Review of Economic Policy, Vol. 22 Issue 2. [http://faculty.haas.berkeley.edu/dalbo/Regulatory\\_Capture\\_Published.pdf](http://faculty.haas.berkeley.edu/dalbo/Regulatory_Capture_Published.pdf)

Once the resource has collapsed, these perverse incentives tend to hold fisheries in an economic, political and biological trap, from which there is seemingly no escape. This process is referred to as "Ludwig's ratchet."<sup>13</sup>

### **The Social Benefits of a Rationalized Fishery**

The term rationalization, when used with respect to fisheries, is used to mean conversion to some sort of a catch share program. The theory that overcapitalization and the tendency toward overfishing could be cured through sole ownership of the fishery and privately owned fishing vessels was first proposed by Anthony Scott in 1955.<sup>14</sup> Catch share programs mimic the prescription of Scott with the exception that the rational sole owner is replaced by a group of quota holders with a financial interest in the health of the stock. This reverses the negative effects of Stigler's "regulatory capture" in that the quota owners will support increased conservation instead of excessive harvests. The combination of the rational interest of the quota holders and the final decision making power of the government satisfies Scott's requirement of "sole ownership."

In a catch share program, the TAC is allocated largely among fishery participants on a percentage basis. This quota share gives its owners the right to harvest a certain share of the TAC, eliminating the problems with derby operations at their source. Quota owners have every incentive to squeeze the maximum amount of value from each ton of round fish, which is the behavior of demanded by efficiency. Those same firms operating under a derby structure had an incentive to derive the maximum financial benefit out of every hour available during the fishing season, which is the behavior described by the term expediency. Fishery managers now generally understand that rationalization of fishery resources is essential to maximize efficiency.

This is not to say that any program bearing the label "rationalization" or "catch share" automatically provides all the economic efficiency that would be provided by a sole owner of a fishery resource. In some rationalized fisheries, there are additional constraints on quota ownership and transferability with goals other than economic efficiency in mind. These additional constraints weaken property rights and do not come without a cost.<sup>15</sup> Grainger and Costello, for example, have shown that the strength of the property right granted in a catch share program is positively correlated with a biological health of the fishery involved.<sup>16</sup>

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<sup>13</sup> Hennessey, T., and Healey, M., *Ludwig's Ratchet and the collapse of the New England Groundfish Stocks* Coastal Management 28:187-213.

<sup>14</sup> Scott, Anthony, *The Fishery: The Objectives of Sole Ownership* Journal of Political Economy Vol. 63, Issue 2 116-124 (April 1955).

<sup>15</sup> Environmental Defense Fund, *Catch Share Design Manual*, 2010.

<sup>16</sup> Grainger, Corbett A., and Costello, Christopher, *The Value of Secure Property Rights: Evidence from Global Fisheries*, NBER working paper, 1709 (May 2011).

## II. Catch Share Programs: The Initial Allocation Problem

As Hannesson<sup>17</sup> has lamented, the typical progression of fisheries here and throughout the world is that we tend to wait until a fishery is overcapitalized through the uncontrolled entry process inherent in a derby fishery, before attempting to impose a catch share system. The fact that we tend to wait until a fishery is overcapitalized complicates the initial allocation process enormously. Because a conversion to catch share management has usually involved allocation of quota to those with investment in the fishery, any perception that a quota allocation is imminent causes firms the industry to “invest” in an effort to maximize their catch history that will be used for determining allocations of quota. The first impact of a move toward rationalization, therefore, is to make the existing overcapitalization problem worse.

### Control dates

A control date announcement is an Advanced Notice of Proposed Rulemaking that must be voted on by a council, approved by NOAA and published in the Federal Register. Control dates are not legally binding.<sup>18</sup>

The control date announcement has two components: (1) Notice that a council is considering developing a catch share program; and, (2) a date, after which fishery participation may not be considered when a final decision is made to define the limits of the program. With respect to their influence on investment decisions, these two components work at cross purposes with one another. The announcement that the council is considering a catch share program stimulates the very problem, investment and behavior that increases industry capacity, that rationalization programs are intended to prevent. The specification of the date, which is usually essentially coincident with a council’s action to begin development of a catch share program, is meant to ensure that the industry understands that the time for expansion of capacity for the purpose of capturing fishing rights may have ended, and so discourages further investment in capacity.<sup>19 20</sup> The control date serves to provide the industry with information useful in the formation of reasonable expectations.

If the industry believed universally that date in the announcement was in fact a perfect predictor of the last day of fishery participation that would be considered for the allocation, investment and operating strategies, for the purpose of maximizing fishing history would cease immediately. If the Industry believed that the date itself was completely irrelevant to the final decision on qualifying dates, the race to fish for quota would be exacerbated. Under the Magnuson-Stevens Act (MSA) a regional fishery management council is able to select years of history for purposes of allocating

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<sup>17</sup> Rognvaldur Hannesson, *The Privatization of the Ocean*, p. 172.

<sup>18</sup> <http://www.pcouncil.org/resources/archives/control-dates/>

<sup>19</sup> *Pacific Dawn, LLC. v. John Bryson*, Summary Judgment, Dec 22, 2011.

<sup>20</sup> <http://www.pcouncil.org/resources/archives/control-dates/>

quota under a catch share plan that are later to, *or previous to*, the control date. We however are unaware of any instances where the end of the qualifying period was set prior to the date announced in the control date announcement.

Even if there were zero capacity enhancements after a control date was published, there would still be differences in the distribution of harvests in the period from the control date announcement to implementation of a catch-share program. Randomness alone will always produce variation in relative catch shares between two distinct time periods. For example, the biomass could move closer to a particular port. This would affect the distribution of the catch history, but would not affect in any way the distribution of invested capital that the proxy of catch history is attempting to measure.

If these differences between the distribution of harvesting and processing participation are treated as a legitimate reason to move the years used for allocation of quota to a time after the control date, a dangerous feedback loop will exist. Some firms will realize that investing in additional capacity after the control date would cause the years used for determination of quota allocation to move forward. These firms would speculatively invest in capacity enhancement, or increase the intensity of their operations. Other firms will realize that respecting the control date would result in a loss of quota they would otherwise have received, and they would also invest in capacity enhancement, or increase the intensity of their operation in order to protect their initial allocation position. Firms that chose to ignore the control date could be expected to exert political pressure and take legal action to have the years used to determine initial allocation of quota to include a period after the control date in order to "better reflect the pattern of current harvests." Instead of providing notice to the industry that increases in relative harvest after the publication of a control date may not result in the allocation of quota, a control date would instead become the starting gun on an intensive "race-to-fish" not for fish, but for something far more valuable; quota.

### **The rationale behind the initial allocation of quota in a catch share program system**

A central problem in rationalizing a fishery is the initial allocation of quota, yet very little thought or analysis has been given to the rationale behind the initial allocation of quota when an overcapitalized fishery is rationalized. In industrial, capital intensive fisheries, historically allocations have been given to owners of capital in the fishery; typically vessel owners and, since the American Fisheries Act was enacted in 1998, processing plant owners have also received rights when the fishery is rationalized. In resolving the problem caused by the initial allocation of quota, it is important to understand the rationale behind the allocation of quota to owners of capital in the fisheries.

#### 1. Why not hold an auction?

The MSA allows for an auction the fishing rights.<sup>21</sup> At first blush an auction seems sensible. Our Nation's fishery resources belong to the general public.<sup>22</sup> So why allocate fishing rights to private

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<sup>21</sup> Riley, Christopher C., and Plesha, Joseph T., *Allocations of Harvesting Quota in the Shorebased Whiting Fishery*, p. 4 (Nov. 2008). [http://www.pcouncil.org/bb/2007/1107/D7h\\_PC.pdf](http://www.pcouncil.org/bb/2007/1107/D7h_PC.pdf)

entities at all when the fish actually belong to the general public? An auction, it turns out, would be financially devastating to the industry participating in a fishery, when that industry is both capital intensive and as grossly overcapitalized as was the Pacific whiting industry. An auction would in fact be an expropriation of the value of investments made in the fishery without compensation.<sup>23</sup>

In order to understand the economics of this, it is useful to imagine the situation where the quota holder has no investment in the capital involved in the fishery. This allows for a clear analysis of the financial consequences of rationalization on the recipients of the quota, and the owners of the non-malleable physical capital dedicated to the fishery. If the rationalization occurs in a fishery operating under a license limitation system in economic equilibrium, with a level of capitalization twice what is optimum for the fishery, a fishing vessel owning firm would be earning on average, the market return on investment on its vessel. The same can be said for the owners of processing facilities. Immediately upon the beginning of operations under the catch-share program, however, these 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 de-capitalize an overcapitalized industry. The owners of the physical capital cannot expect to realize any return on their investment until the excess capital stock is depreciated to the point where it is at the optimal level for the recently rationalized fishery.<sup>24</sup> Another part of this loss is actually a transfer of wealth from owners of vessels and processing facilities *to* quota holders.<sup>25</sup>

The mechanism at work here 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 when it is rationalized. A quota holder would not need to own a boat or a processing plant in order to participate in a fishery. If a quota holder decides to participate in the fishery, it could simply hold a reverse auction<sup>26</sup> among fishing vessel owners. The vessel owners would bid the price of “fishing services”<sup>27</sup> down to the point where the “winning” boat just covered its variable

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<sup>22</sup> The United States claims sovereign rights over all fish within the United States exclusive economic zone. 16 U.S.C. §1853a.

<sup>23</sup> 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). See also, Matulich, S.C., Mittelhammer, and Reberte, *Toward More Complete Model of Individual Transferrable Fishing Quotas: Implications of Incorporating the Processing Sector*, *Journal of Environmental Economics and Management* Vol. 31(1) 112-28 (1996).

<sup>24</sup> *Id.*

<sup>25</sup> *Id.*

<sup>26</sup> In a reverse auction, the sellers compete to obtain business from the buyer and prices will typically decrease as the sellers undercut each other.

<sup>27</sup> “Fishing services” as defined here refers to a fishing transaction wherein the contract is made on a services rendered basis rather than the traditional price per pound basis. In other words, “fishing services” includes locating, capturing, and delivering fish to a specified location.

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 costs of production. The quota owners will temporarily own not only the fish in the fishery but also usufructuary rights to the 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 (i.e., when a fishery is no longer overcapitalized). One model produced that was loosely based on the Pacific whiting fishery estimated that the direct impact of the allocation would result in the loss of over 90% in the value of non-malleable capital assets in both the harvesting and processing sectors.<sup>28</sup>

This explains the fact that owners of the physical capital in a fishery that will be devalued by rationalization are among the fiercest opponents of any attempt to rationalize a fishery where the owners' loss is not expected to be compensated with an initial allocation of quota. In short, no one with capital investments in vessels or processing plants would support a simple auction of the resource to rationalize a fishery because they understand that much of value of their boats or plants would be expropriated without compensation.

Fishery managers in the U.S. and elsewhere have solved this problem by allocating the fishing rights to those firms that can reasonably be expected to suffer the loss in capital value that results from rationalization.

There is no question that the U.S. treasury, in the short run, and neglecting consequential effects, would be better served by an auction than it would be by a direct allocation to private entities. This is not to say that such a decision would be socially optimal. The first reason to choose a direct allocation to those private entities that would otherwise be the losers in the process relies on the same regulatory capture mechanism described by Stigler,<sup>29</sup> which is to say that regulations often reflect the economic interest of the regulated. It is therefore more probable a fishery will be rationalized if the impacted industry is supporting the process instead of opposing it.

A second, and perhaps more compelling reason that in most catch share programs the quota is allocated nearly exclusively to the owners of capital is that an auction of the rights presents what is known as a "time inconsistency" problem. The essence of a time inconsistency problem is that what may seem to be an optimal decision based on a simple calculation of costs and benefits may not yield the optimum choice because such calculations do not take into account of the effect of the decision on future behavior. The existence of such problems has been reflected in decision-making conventions for centuries. The legal principle of *Stare Decisis* is an example.

All Courts rule ex-post, after most economic decisions are sunk. This might generate a time-inconsistency problem. From an ex-ante perspective, Courts will have the

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<sup>28</sup> Riley and Plesha, *supra*, p. 13.

<sup>29</sup> Stigler, George J., *The theory of Economic Regulation*, The Bell Journal of Economics and Management Science, Vol. 2, Issue 2, 3-21 (1971).

(ex-post) temptation to be excessively lenient. This observation is at the root of the principle of *stare decisis*.<sup>30</sup>

Finn E. Kydland and Edward E. Prescott published an article in 1977<sup>31</sup> *Rules rather than Discretion: the Inconsistency of Optimal Plans*, which formalized this concept and reduced to it a series of mathematical proofs. This article was a major part of the work for which they were awarded the 2004 Nobel Prize in Economics. In this article they provide an example of the “time inconsistency” problem from patent law.

A second example is patent policy. Given that resources have been allocated to inventive activity which resulted in a new product or process, the efficient policy is not to permit patent protection. For this example, few would seriously consider this optimal-control-theory solution as being reasonable. Rather, the question would be posed in terms of the optimal patent life (see, e.g., Nordhaus 1969), which takes into consideration both the incentive for inventive activity provided by patent protection and the loss in consumer surplus that results when someone realizes monopoly rents. In other words, economic theory is used to predict the effects of alternative policy rules, and one with good operating characteristics is selected.

A proposed alteration of existing patent law, which is analogous to distributing the fishing rights of the whiting industry, would be as follows: Congress passes legislation that cancels all existing patents and pending applications, however, the law does not affect any way future patent applications. Future developers of new technology, however, would remain fearful that Congress would again cancel all new patents at some future date, thereby greatly decreasing the incentive to make investments necessary for future invention.

If the government auctioned the resource, the entire net present value of the resource would be transferred to the government, as would the net present value of the excess malleable capital. In an allocation to private entities the U.S. Treasury would still receive tax revenue in perpetuity from the resource, which would be roughly equal to 35% of the net present value of that resource. Far more importantly, while an auction of fishing rights is legal under the MSA any benefit to the Treasury would be offset as a consequence of the increase political risk attached to, and premium demanded for, any investment in the United States.

## 2. Criteria for initial allocations to private entities.

Assuming the allocation will be made primarily to the industry itself, the first question is what entities within the industry should get quota, and why should these entities receive quota? What

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<sup>30</sup> Felli, Leonardo, Anderlini, Luca and Riboni, Alessandro, *Why Stare Decisis?*, CEPR Discussion papers, 8266. Centre for Economic Policy Research, London, UK (2011).

<sup>31</sup> Kydland, Finn E., and Prescott, Edward E., *Rules rather than Discretion: the Inconsistency of Optimal Plans*, (1977).

public service have these entities provided, or what damage would these entities suffer as a result of rationalization?

The MSA applies to every federally managed fishery. It provides managers with a wide range of alternatives in the allocation decision. It requires that a council formally consider a large number of parameters across the history of the fishery before making a recommendation as to the rules that define the actual allocation. These include ecological, economic and sociological considerations. In small scale, artisanal, labor-intensive fisheries, sociological concerns — and therefore the personal participation of crew members — may trump those of economic efficiency. In large scale, industrial, capital intensive fisheries such as Alaska pollock, the allocation is received by those with investments in the fishery. In some fisheries the allocation is split between the investors in capital and labor. In all these allocations, however, landing history has been used as the proxy for estimating relative amounts of participation or investment. *"Often, allocation is based on catch history as many in the fishing industry view their history as a quantifiable and verifiable proxy for participation and investment."*<sup>32</sup>

### **The quality of investments**

The purpose of initial allocations of quota to the investors of harvesting and processing capital in a fishery is to compensate those investors for the loss of value their investments will suffer when a fishery is rationalized. Otherwise, why allocate quota to the private entities (typically corporations) that own the processing plants or harvesting vessels? The corporate entities that own fishing vessels, for example, have never harvested a pound of fish. We define quality of investment, therefore, to mean a particular investment's relative fitness for qualification in a program that compensates for the expected loss in value that is a necessary byproduct of the rationalization process.

We propose here a two dimensional method for evaluating the quality of investments, these being (1) the contribution made to society by the investor at the time the investment was made; and, (2) the consideration due a particular investor as a result of reasonable expectations that investor had as a result of its decision to make, or not make, an investment at a particular time.

#### 1. Societal impact.

We classify investments into two categories socially positive and socially negative. We make this evaluation on the basis of the conditions at the time the investment was made. Those that were made prior to the point where the industry was capable of harvesting and processing the resulted in an increase in final production from the fishery had a positive societal impact. The initial private returns on these investments must have been at least high enough to justify the risk as the fishery was full capitalized relatively rapidly. Because these capacity investments resulted in the utilization of additional fish and did not simply redistribute the utilization from the already existing industry to the investor in new capacity. Those capacity investments that occurred after the full U.S. utilization have a negative economic impact on society as the landings attributable to the new

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<sup>32</sup> Establishing Criteria for IFQ programs Managing Fisheries, 2005, (Emphasis added.)  
<http://www.managingfisheries.org/2005/backgrounders/establishing.pdf>

investment come 100% from the landings attributable to previous investments. The first component of societal loss is the value of resources that were diverted away from productive uses to a use that produces zero or less than zero additional product. Additional loss results from the shortening of the fishing season and the fact that additional negative value investment in capacity causes an equal amount, in capacity terms, of negative value investment in the processing sector. Of course this also works in reverse. New investment in processing capacity also causes additional investment in harvesting capacity.

## 2. Basis for reasonable expectations.

Reasonable Expectations are "*those spoken and unspoken understandings on which the founders of a venture rely when commencing the venture.*"<sup>33</sup> We restrict this to relative level of expectations that the harvest processing history would be excluded from the calculation that determines a future distribution of quota. The basis we use for these expectations is limited to official actions a council or the agency. These range from a *tacit* indication that the management authorities believed that additional capacity would be harmful, such as the imposition of the license limitation, to the *expressed*, a publication of a control date, to the *unequivocal*, in the form of final council action. Using this definition, relevant expectations began in 1994 with the adoption of the license limitation program in the Pacific whiting fishery.

Reasonable expectations are symmetrical. When a firm pursues a strategy of increasing its relative participation it has done so with some level of expectation that the increase in relative participation will be rewarded with a grant of fishing rights with a value that exceeds its private financial cost of that strategy.

When a firm pursues a strategy of not increasing, or actually decreasing its participation, it has done so with some level of a level of expectation that the decrease in relative participation will not be punished with a loss of fishing rights with a value that exceeds its private financial savings of that strategy.

For investments made (or not made) at a given time, the strength of the basis for these expectations is a fixed sum. This is to say that the stronger the basis for believing that the potential stranded capital loss that results from an investment will eventually be compensated for by means of a quota allocation, the weaker is the basis for expectations that the decision to not invest will not be elicit punishment via a reduction in the allocated quota. Therefore a "tacit discouragement of additional investment" also means "tacit encouragement of a decision to not invest."

A council typically takes no actions that would affect expectations regarding quota allocation until after the fishery was fully utilized. So actions that tacitly discourage additional investments take place during the time period when additional investments produce a negative societal contribution. It is therefore possible to construct a rank ordered grading of investment quality.

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<sup>33</sup> Kaplan v. First Hartford Corp., 484 F. Supp. 2d 131, 147 (D. Me. 2007).

So, as an example of ranking the quality of investments, if a private firm develops and invests in new technology to harvest and process a completely unutilized stock of fish, and this initial investor is successful so that the fishery soon has additional capital utilizing the resource, it may be that a council would announce a control date and consider developing a catch share program. Then, after the announcement of the control date, a separate private firm were to invest just as much money into harvesting and processing the resource as the initial investing firm, it could be argued that the newly investing firm will have as much stranded capital as the initial investor in the fishery. But the initial investor provided a substantial benefit to society by allowing for the utilization of fishery resources, while the investor whom added capacity after the fishery was fully utilized and a control date was published did so while reducing the net benefits (rents) society receives from the resource and with no reasonable expectations that its capital investments would receive allocations of quota.

3. Investments that are not “devalued” by rationalization.

As stated earlier, after a council has determined the broad definition of the class of potential grantees and the algorithm to be used to divide the allocation among the class of investors, it must decide the limits that define the history that will be used in the final allocation calculation. This must be done in consideration of the National Standards and other relevant factors in the MSA. Compensation for what would otherwise be a regulatory expropriation provides the rationale for choosing a direct allocation to private investors in the industry over an auction. It would seem necessary to first try to exclude from this quality evaluation those investments that will not be stranded, i.e., significantly devalued as a result of the rationalization process.

We have heard it argued that a shorebased plant may be more dependent upon the receipt of quota because the Pacific whiting fishery has moved closer to it while the Pacific Council was making its final allocation decision and the Secretary was reviewing and approving the Council's recommendation.

A superior location for a shorebased plant would translate into a relatively lower cost of fishing services as a vessel would spend less time and burn less fuel in delivering fish to such a plant. A superior location does not get “stranded” when a fishery is rationalized and an award of quota based upon such a fortuitous development is therefore inappropriate. If the distribution of a stock of fish moves toward a plant, an award of quota to such a plant for suddenly having fish nearby is actually perverse, as the lucky plant would merely be a reward for its good fortune, which reward is paid for by those who had bad luck.

Similarly, we have heard it argued that a processor invested in new technology that made it more efficient and therefore it needs to be rewarded with allocations of quota even if those investments were made well after the fishery was fully utilized and a control date published. The claim of new technology is debatable given the well-known methods of processing groundfish such as Pacific whiting, but let us assume the claim is true. If a processing plant developed a machine that resulted in 20% more revenue from each pound of raw whiting delivered to it (or a vessel invested in a net that increased efficiency in harvesting by 20% over other vessels) the investment in new technology would *not* be stranded when the fishery is rationalized because that processor would only have to pay what other processors pay for the rationalized whiting delivered to its plant would

still achieve a 20% more revenue from each pound delivered. The investment in this new technology would receive a return equal to that which it earned in the derby fishery and therefore does not require compensation through the allocation of quota.

### **Capacity Investment “Grades”**

We have graded the capital investments in the fishery in order of their impact on benefits to society and reasonable expectations of those making the investments. Those grades are as follows:

Grade: A — Net-beneficial to society. Investments in a vessel or processing plant that result in additional harvest. These investments also produce a variety of un-quantified positive externalities not captured in accounting measures, including non-proprietary technical development and furtherance of a national goal. For example, a vessel will try four different trawl nets before finding the one that is most efficient and then the net supplier will sell the efficient net to other vessels who invested nothing in the costly experimentation that lead to the identification of the most efficient net.

Grade: B — Net-harmful to society. Investments made in a vessel or a processing plant that does not result in additional harvest, but only a redistribution of the harvesting or processing that already existed in the fishery, but where there is an absence of any *tacit* or *explicit* discouragement by the management authority to make investments in the fishery.

Grade: C — Net-harmful to society. Investments in the fishery made in the presence of *tacit* discouragement (i.e. license limitation program) by the management authorities.

Grade: D — Net-harmful to society, made subsequent to *expressed* discouragement (i.e., publication of a control date) from the management authorities.

Grade: E — Net-harmful to society. Investments in the fishery made subsequent to *unequivocal* discouragement from the management authorities (i.e., publication of final council action). These investments must be of the type that will likely be stranded due to rationalization.

### **Fishing and Processing History as a Proxy for Capital Investments**

To say the least, it would be extremely difficult to objectively measure the amount of capital value that each entity in a fishery would lose in rationalization. Therefore, fishery managers have settled on using "fishing and processing history" as a proxy for the stranded capital losses expected by current participants in the derby fishery.<sup>34</sup> This proxy should work well so long as the term "history" is properly defined and taken seriously by all participants. If the Industry were to believe that "history" might at least in part occur in the future, after the announced control date, the current derby participants would have the incentive to race-to-fish for quota. This behavior would dissipate much of the societal gain that can be expected from fishery rationalization. The race-to-fish-for quota is not necessarily a race involving capital stuffing and new processing plants. The

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<sup>34</sup> Stranded capital is physical capital that has been substantially reduced in value due to a new regulation, policy or statute.

participants in this race have the incentive to create fishing history in the least expensive manner, which includes the use of intensive fishing and processing.

### **Stale control dates**

One concept that has received some credence in this debate is that if, after to the setting of a control date, an "unreasonable" amount of time elapses before final action, this will allegedly cause damage to some firms. A remedy that has been suggested is that a "stale" control date must be abandoned to avoid causing some unspecified form of damage. We have been unable to find the logic behind the concept of staleness. How is net social utility negatively affected by the aging of a control date? We assert that the aging of a control date does not and cannot cause economic damage. We discuss the simple and most extreme case where a control date is published and, for whatever reason, a council never reaches final action.

Control dates are not legally binding, but they do impact reasonable expectations of the industry that has invested in the fishery, or is considering investing in the future. For at least the past twenty years, industry has always been aware that there was some possibility that it was operating in a time period that could possibly be part of "history" that would one day be converted into allocations of quota. The sort of conditions that prompt a council to take such action would have been obvious to the industry years before, and it is certain that this would have had some simulative effect on capital investment and operating behavior. It is, therefore, safe to say that on the day a control date is published, a fishery is more overcapitalized than it would have been if the concept of catch share management had never been invented, simply because essentially all control dates are announced during a low-grade race-to-fish for quota.

On the day a control date is announced, additional investment in socially harmful capital investments for the purpose of capacity enhancement is at least partially suppressed. Socially harmful and human-life endangering operational "investments" for the purpose of capturing a greater share of the eventual allocation are also suppressed. Overcapitalization and risky operational behavior are the problems we are trying to address with a catch share program. Society begins collecting partial returns in the form of reductions in potential overcapitalization as soon as the control date announcement is made.

If the industry is certain that the allocation will not be made on the basis of any landings after the control date, the suppressive effect of the control date is immediate and complete. The race-to-fish for quota ends. As long as the industry continues to believe with 100% certainty that no allocation will ever be made using history after the control date, the fishery would de-capitalize through depreciation (wearing out) of the physical capital. Capacity would decline by attrition, as major maintenance projects on capital that will soon be surplus are curtailed. Disinvestment will continue until total capitalization is equal to what it would have been in an ordinary race-to-fish derby. As long as the control date is perfectly durable, the time it is expected to take for final action, or the length of time it actually takes (even if this is literally forever) does not reduce this suppressive effect one iota.

The existence of the concept that the rationalization process may take so long that the old control date *must* be abandoned (i.e., a council cannot consider qualifying years for quota to end on a date at or before the published control date) increases the expected probability that actions and investments with an effect of increasing the relative share of landings by a firm will be rewarded with an increase in the amount of quota allocated. Any credence given to the concept of perishable control dates is harmful to society, in that it encourages and causes more anti-social behavior (and discourages and causes less pro-social behavior) than would otherwise be the case on the part of the industry, and so exacerbates the very problem that catch share management is designed to suppress.

We believe that, given the time needed to complete the Fishery Management Plan procedure as required in the MSA, realization of the full benefits of rationalization and the existence of perishable control dates are mutually exclusive. Any attempt to rationalize a fishery that eventually fails, where a control date existed that was believed to be perishable, will certainly leave the fishery even more overcapitalized than it would otherwise have been if the managers had simply allowed a continuation of a derby fishery.

### **III. Fishery Development in the United States EEZ and Ranking of Investments in the Pacific Whiting Fishery**

In order to illustrate the economic evolution inherent in the fishery development process and the regulatory responses to that evolution, we have divided this process into five phases. In Phase I, we present the initial exploitation phase as it occurred in Pacific whiting specifically, as the initial exploitation of whiting occurred in a way for which there is no precedent, or general case. In Phases II-V, we first discuss the general fishery development case, which is followed by comment on the specific case of the Pacific whiting fishery.

#### **Phase I: Initial Exploitation and Development (1976-1992)**

The development domestic utilization of the Pacific whiting fishery began with passage of the MSA (then called Fishery Conservation and Management Act) in 1976. This law asserted the United State's right to manage the fisheries within 200 miles of shore. At the time of this law's passage, the Pacific whiting fishery was exploited by factory trawlers from the Soviet Union and Japan. A stated goal of the MSA was to encourage the domestic fishing and processing Industry to develop the skills and invest the capital necessary to convert these fisheries from foreign into domestic operations. This was goal soon developed the moniker "Americanization." The MSA established preference for U.S. fishermen, meaning that the amount of the TAC that was available for foreign fishing fleets was the remainder of the TAC, after that which the U.S. fleet was able to harvest was subtracted. Congress, with passage of the MSA, had made the Americanization of the fisheries a national goal.

In 1976 the U.S. seafood industry had neither the equipment nor the expertise to exploit these newly available resources. The Pacific whiting industry, and most of the other trawl-caught groundfish industries that were opened up by the MSA, grew by taking over the harvesting, then the processing and then the marketing of the target species. The first step was a joint venture fishery

with the USSR that began in 1978. In this operation, U.S catcher boats caught the fish and then transferred them while they were still in the cod-end to the Soviet ships for processing and freezing.

The financial returns were sufficient to attract vessels into the fishery quickly. Within four years, the U.S. fishing fleet catch grew from 856 MT in 1978 to 72,100 MT in 1983, the first year when 100% of the harvest was caught by U.S. vessels.<sup>35</sup>

The development of processing capability proceeded at a much slower pace than the harvesting sector. Some of the difficulty was due to the fact that the conversion of existing processing assets was much more complicated than the conversion of crab boats and bottom-trawlers to mid-water trawlers.

In 1978, Congress, after "reaching an understanding that mere assertion of jurisdiction was not enough to "Americanize" the fishery,"<sup>36</sup> passed the Processor Preference Amendment that gave preferential claim to the TAC to operations where both the harvesting and the processing were accomplished by U.S.-controlled firms.

In 1980, Congress passed the American Fisheries Promotion Act, that provided for research and development of new products and processes, a vessel loan guarantee program and established Fishery Trade Officers within the State Department.

In 1988, Congress passed the Anti-Reflagging Act, which prohibited the reflagging of existing foreign process ships and tightened ownership and manning restriction for ships operating in U.S. fisheries. The following quote from the Federal Register documents the contribution of this statute to the overall goal of "Americanization."

Eleven years later another step was taken to further Americanize U.S. fisheries. The Commercial Fishing Industry Vessel Anti-Reflagging Act of 1987 required U.S. citizens to own and control more than 50 percent of any U.S.-flag fishing vessel. As the last of the foreign-flag fishing vessels in U.S. fisheries were being replaced by U.S.-flag vessels in 1986, federal law did not require U.S. fishing vessels to carry U.S. crew members.<sup>37</sup>

Investments made during phase I would all qualify as grade "A" under our criteria. The following evidence justifies this assertion:

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<sup>35</sup> Nelson, R.E., Marine Fisheries Review Vol. 47(2) 39-41 (1985).

<sup>36</sup> Greenberg, Eldon, Presentation at the Eighth Marine Law Symposium Roger Williams University School of Law Bristol, Rhode Island (Nov. 4, 2010).

<sup>37</sup> <https://www.federalregister.gov/articles/2000/07/27/00-18941/citizenship-standards-for-vessel-ownership-and-financing-American-fisheries-act>

- New entry resulted in additional fish utilized so that the private return to investors was not simply a transfer of income from the pre-existing industry where the return on investment is automatically and completely offset by a reduction in the returns to the pre-existing fleet. The rapid pace of development is consistent only with a high return on investment, substantially above market rates of return. The fact that entry continued at a rapid pace after 1992 is further indication that return on investments were above the market rate of return, a condition which defines an investment with a net national benefit.
- Firms investing in the whiting industry were furthering a national goal.<sup>38</sup> This was clearly expressed in five separate pieces of legislation. Furtherance of a national goal is a societal benefit.
- The firms that first entered and developed this industry, as is the case in nearly all manufacturing, developed the necessary non-proprietary technology and human capital. This resulted in a positive externality.

#### **Phase II: Rent Dissipation through Entry of Additional Capacity 1993-1994**

So long as *above* market *average* returns still exist at the time when the fishery is fully developed, entry will continue despite the fact that the *marginal* rate of social return will be negative when the fishery is limited by a TAC rather than a lack of capacity.<sup>39</sup> Entry will continue until average returns fall to the market rate, or until the fishery is otherwise limited through some sort of effective limited entry program. It should be noted that "return on investment" includes, in addition to the receipts for raw fish or fishery products, the perceived value of fishing history in any future limited entry or catch share program. The negative marginal rate of social return on capacity investments when the fishery is fully developed means that such investments impose a net cost on society because the capital so used produces nothing whilst it could have produced goods and services with value equal to the market rate of return if deployed elsewhere in the economy. However, this is not the only source of the societal loss. Another component of loss is the fact that increased capacity shortens the season, which in and of itself increases costs throughout the industry without adding anything, and likely reduces the total value of finished products.

Entry of catcher vessels into the Pacific whiting fishery ended in 1994 with the imposition of the license limitation program, though entry continued through capital stuffing. There was no limited entry in processing capacity. This is important because when a new processor enters the fishery, it tends to increase the demand for raw fish and thus push the ex-vessel prices up thereby fueling the

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<sup>38</sup> Handbook of marine fisheries conservation and management R Quinton Grafton ed. Governance of Fisheries in the United States chapter 29 Daniel S. Holland. Oxford University Press (2010).

<sup>39</sup> The negative marginal rate of social return is primarily due to the fact that private returns of a new entrant completely and exactly cancel out returns earned by the fleet that existed prior to the entry of a new vessel, or a capacity added to an existing vessel. This is significantly exacerbated by shortened fishing seasons and an increase in cost in both harvesting and processing sectors, along with a reduction in finished product value.

demand for additional harvesting capacity, which in turn causes further capital stuffing and more intense fishing activity.

We consider investments made in this period to be grade “B” in that they did not result in an increased harvest or utilization of Pacific whiting, but where there is an absence of any *tacit* discouragement by the management authority to make investments in the fishery.

### **Phase III: From License Limitation to Catch-Share Management: Before Final Control Date (1994-2003)**

As mentioned earlier, new license limitation programs are now generally seen as an interim step between open access and a catch share fishery management program. The fact that imposition of a license limitation program is now seen as a signal that a fishery will be converted to a catch share system provides an additional incentive for new, and at the margin, socially harmful increases in capacity. There can be no dispute that a low intensity race to fish for quota was occurring at least as far back in time as the 1994 start of the license limitation program.

Capital stuffing in pursuit of increased daily capacity under a license limitation program has a negative societal value whether the motivation for such investment is maximization of current income or the capture of future fishing rights. Socially harmful investments in fishing power can be augmented with operational investments such as fishing for immature lower priced fish if the Catch per Unit Effort on the immature, lower, or even zero priced fish is high enough so that the perceived value of the history earned offsets the lower price of fish.

Although it is not legally binding, a control date draws a bright line in time beyond which the industry can have no reasonable expectation that increases in their relative harvest or processing history will be reflected in increases in their share of quota under any future allocation. The first control date announced by the Pacific Council was 1998. This was published during that year in the Federal Register. The verbatim announcement follows:

The Pacific Fishery Management Council (Council) is considering whether there is a need to impose additional management measures to further limit harvest capacity or to allocate between or within the limited entry commercial and the recreational groundfish fisheries in the U.S. exclusive economic zone off the States of Washington, Oregon, and California. If the Council determines that additional management measures are needed, the Council will recommend a rulemaking to implement those measures. Possible measures include allocating harvest of particular groundfish species (rockfish and lingcod) between limited entry gear groups and between commercial and recreational fisheries and further limiting access to certain species within the Pacific Coast groundfish complex. The Council may proceed with some or all of these measures. In order to discourage fishers from intensifying their fishing efforts for the purpose of amassing catch history for any allocation or additional limited access program developed by the Council, the Council announced on April 9, 1998, that any program proposed would not include consideration of catch landed after that date. At present, the Council is planning to

consider catch history through the 1997 fishing season. Persons interested in the Pacific Coast groundfish fishery should contact the Council to stay up to date on the management of the fishery.<sup>40</sup>

Though the 1998 control date was obviously superseded by the 2003 date, this action by the Pacific Council remains relevant because it served to provide notification to the industry that it wanted to discourage additional capacity enhancing investments or behavior. By implication, it also serves to encourage those contemplating a decision to cease investing in additional capacity, that such a decision would not likely affect their eventual limited entry or catch share allocation. It should also be noted that any capacity investments made between 1998 and 2003 were made despite the expressed discouragement of the Council.

The Pacific whiting fishery operated under a license limitation program from 1994 through the fall of 2003, when the Council developed a control date of November 6, 2003. In the years immediately preceding the announcement of the control date, a significant investment in a new shorebased processing facility was made. This investment was socially harmful in that it provided a significant increase in capacity at a significant cost, at a time when the marginal societal value of capacity was negative. It has been argued that this new factory made a marginal contribution to the public good due to its superior location. If this is true, this part of the capital investment would not be stranded due to the catch share system because the entire benefit of the location would be reflected in a lower cost of the fishing services needed to supply the plant. Thus, it would be inappropriate to compensate the owners of this plant for this investment, even if, in the unlikely case that some sort of investment was what caused the fish to move. This is another demonstration of the weakness of catch history as a proxy for stranded capital loss.

We would consider investments during this period to be grade “C” using our grading scale, as they were made after at least a tacit discouragement by the Council.

#### **Phase IV: From License Limitation to a Catch Share Management After the (most recent) Control Date (2003-2008)**

This phase begins with the announcement of the control date and ends with the final Council action. The setting of a control date that is taken seriously by the industry causes the benefits of rationalization to begin immediately. In a perfect world, it ends the race-to-fish for quota. The behavior of the industry during this phase will be entirely determined by expectations regarding two things: the probability and timing of the conversion to the catch share program and the conditional probability that, given a conversion to a catch share program indeed occurs, the control date will be the same date used to determine harvesting and processing history. The Pacific Council took final action on the catch share program in November of 2008. The quota was allocated based on vessels’ and processors’ relative history within the time period set by the Council. This is shown in Table 1 below.

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<sup>40</sup> <http://www.pcouncil.org/resources/archives/control-dates/>

Initial Allocation Group	History Years for Initial Allocation
Shoreside Harvesters	1994 through 2003
Shoreside Whiting Processors	1998 through 2004
Mothership Catcher Vessels	1994 through 2003

Table 1.

There were a few notable investments in capacity in the Pacific whiting fishery where the quantity of fish processed by some processors steadily increased after the announcement of the control date. Further, there was one Pacific whiting processor who first began its operations after publication of the control date. We would consider investments after the publication of the control date to be grade “D” under our grading system as they were made after being explicitly discouraged.

**Phase V: Implementation and Operation 2008-????**

The implementation phase begins immediately after the final Council action and continues until the time when both the fishery is operating under the catch share system and all disputes regarding the initial quota allocation are settled. In the years between the final Council action and the beginning of catch share operations, the fishery continues to operate under the license limitation program. During this period, the industry accelerates its evolution from throughput maximizers to value-per-ton maximizers.

When the catch share plan becomes operational, the ex-vessel price of fish will reflect both the costs of harvesting the fish and a quota value. The return on assets that are intended simply to maximize capacity will normally be close to zero. Excess capacity-related assets begin either leaving the fishery for other employment, are retired or are used up and not replaced while socially beneficial value enhancements (e.g. increased product quality, increased recovery rate, etc.) increase.

This was clearly the case in Alaska pollock fishery. Pacific whiting is a close relative of pollock. It is harvested with very similar gear, processed on similar or identical equipment, and processed into the same sorts of products (surimi, mince, fillet block, H&G) as pollock.

The fishery slows down and the season length increases. Recovery of finished product increases while discards decrease. The harvesting of small immature fish should drop immediately as harvesting small fish carries a strong financial penalty in the form of wasted quota. Another benefit expected from the catch share program is that fishing intensity decreases, reducing costs, and substantially reducing the physical hazards associated with commercial fishing.

The final rule that implemented the catch share program for Pacific whiting was published in the Federal register on October 1, 2010.

The catch share management of the Pacific whiting fishery started in January 2011. The catch share program is delivering the benefits that were promised. This is evidenced in specific comments from the industry prior to the discussion of this issue at the April Pacific Council meeting. The season has been extended, discards and fish processed directly into fishmeal have fallen, and new investments are now being directed toward extracting more value from a ton of fish rather than utilizing a ton of fish as quickly as possible.

Investments made by the industry to increase harvesting or processing capacity after the date of final Council action to rationalize the Pacific whiting fishery would earn a grade “E” under our grading system.

#### **IV. Current Status of Pacific Whiting Allocation**

On October 25, 2010, a complaint was filed in U.S. District Court for the Northern District of California on behalf of plaintiffs including the Pacific Dawn LLC. The complaint alleged, among other things, that the Pacific whiting allocation was illegal under the MSA on grounds of equity. They contended that the Secretary of Commerce failed in its obligation to consider current harvests as required by the MSA and that quota shares should have been allocated to firms who entered, or increased their landings after the control date.<sup>41</sup>

The court issued a judgment partially in favor of the plaintiffs on December 22, 2011. The primary basis of this judgment was that harvests after 2003 were considered for some purposes, but not in for the decision of how quota should be allocated, and use of a 2004 date as the last year processors’ participation earned allocations of quota was a result of a political compromise rather than the considerations required under the MSA.<sup>42</sup> On February 21, 2012, the court ordered that the regulations regarding the Pacific whiting be remanded to the Council for reconsideration.

At its April 2012 meeting in Seattle, the Pacific Council chose a suite of five alternatives of fishing history for the shorebased processors for analysis in preparation for the process of choosing a preliminary preferred alternative at the June council meeting.

The MSA requires, among other things, that allocations of Pacific whiting be fair and equitable and that the Council consider current and historical harvests; and investments in and dependence upon the Pacific whiting fishery when making those allocations.<sup>43</sup> Regardless of any published control date, therefore, the Council must carefully consider current (as well as historical) harvest.

Taken in the context of the purpose of rationalizing the Pacific whiting fishery and the reason that the private entities that own capital in harvesting and processing capacity receive allocations (as

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<sup>41</sup> Pacific Dawn v. Locke, Plaintiffs’ Motion for Summary Judgment, p. 12 (Nov. 14, 2011).

<sup>42</sup> Pacific Dawn V. Locke, Order, p.10 and 11 (Dec. 22, 2011).

<sup>43</sup> 18 U.S.C. §1853a.

opposed to the general public) consideration of current and historical harvest and investments indicate that the Council's initial choice of qualifying years was fair and equitable.

1. Prior to 1993 investments made in harvesting and processing capacity resulted in additional harvest and production of food from the fishery. These investments also produced a variety of un-quantified positive externalities not captured in accounting measures, including non-proprietary technical development and furtherance of a national goal of Americanizing the utilization of domestic fishery resources.
2. During 1993 and 1994 investments made in vessels or a processing plant capacity that did not result in additional harvest or production of food, but there is an absence of even a *tacit* discouragement by the management authority to make investments in the fishery.
3. From 1994 through 2003 investments made in the fishery were done so with at least tacit discouragement from the management authority. These investments resulted in negative societal consequences consistent with a derby fishery.
4. After 2003 any investments in the fishery resulted in no additional harvest and were made with formal public notice that such activities may not result in the awarding of quota. These investments not only resulted in negative societal consequences of a derby fishery, they could have been made in a race-to-fish, not for fish but for future allocations of quota, exacerbating these negative impacts. Because increases in relative production could be a result of "intense operation," or of other participants reducing their own "intensity" from a race to fish for quota level, in response to the publication of the control date. Therefore relative landings are not a plausible proxy for capital investment after the publication of the control date.
5. After final action by the Pacific Council in 2008 investments in additional harvesting and processing capacity (as opposed to investments in efficiency) would be extremely unlikely as capital must leave an overcapitalized fishery after it is rationalized.

It is important when considering of current and historical harvests, and investments in and dependence upon the fishery, to recognize the quality of the investments in terms of societal goals. The purpose of rationalizing a fishery is to allow more efficient utilization of the resource through de-capitalization of an overcapitalized industry. In determining a fair and equitable allocation, considerations of an investor's reasonable expectations are also relevant. Given that investments made after 2003 to increase capacity had a net-negative impact on society, may have been undertaken in a race-to-fish for quota exacerbating the overcapitalization problem, and were undertaken with clear public notice that they may not result in the allocation of quota it seems rational that the Council would, after consideration of these recent investment's impacts, chose dates for catch history that end at 2003. In addition, given that catch history is a proxy for capital investments in the fishery, participation after 2003 may not be a good proxy for actual investment in the fishery as vessel and processing plant owners will have a strong incentive to increase their production through intensive operation rather than additional capital investment. Moreover, it would irrational in a program designed to de-capitalize the fishery, to reward with quota those who

added additional capital during the period when the Council was developing its catch share program.

For these reasons, we believe that after consideration of current and historical harvests, and investments and dependence upon the fishery, the Pacific Council's choice of years to determine history, as originally developed in 2008, were fair and equitable.

We believe that a decision to re-allocate from those who ended their participation in the race-to-fish for quota, in response to Council actions, to a group that continued in that race despite those Council announcements, is irrational and inequitable given that the purpose of developing a catch share program is to reduce overcapitalization.

As irrational as it would be to reward with allocations of quota those who exacerbated an already overcapitalized fishery while the Pacific Council was deciding how best to rationalize that fishery, it is likely that only a fraction of the total damage to the national interest that would result by such a decision, would be felt in the Pacific whiting industry. Many of our Nation's fisheries are currently operating below their potential. The science of fishery management has demonstrated a method of managing fisheries that provides for both a healthy stock and a healthy industry. As catch share programs are developed around the country, the reward of quota allocation to those firms who increase their relative participation during development of the catch share program in the Pacific whiting fishery, could have the precedential impact of causing intensive races-to-fish for quota in these other fisheries, beyond what has been seen in the past.