

Recommendations for Excessive-Share Limits in the Surfclam and Ocean Quahog Fisheries

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Executive Summary

A. Assignment

We have been asked to give independent advice to the National Marine Fisheries Service (“NMFS”) and the Mid-Atlantic Fishery Management Council (“Council” or “MAFMC”) on determining how, in order to protect against market power without constraining the workings of competition, to set an excessive-share limit in individual transferable quota (“ITQ”) systems in general, and in the Surfclam and Ocean Quahog (“SCOQ”) fisheries in particular. This draft report provides our recommendations on: 1) an operational rule or process that could be used to set such an excessive-share limit in terms of the maximum percentage of quota that can be owned or otherwise controlled by a single individual or entity; and 2) application of this rule or process using available data to determine an appropriate excessive-share limit in the SCOQ ITQ system.

B. The Surfclam and Ocean Quahog Fisheries

Surfclams and Ocean Quahogs are bottom-dwelling species of clams that are harvested off of the East Coast of the United States using vessels equipped with hydraulic dredges. The harvest supports processing of Surfclams and Ocean Quahogs in a number of states.

Fisheries are a well known example of a common-pool renewable resource. Regulation of fisheries limits access and fishing effort (e.g., by limiting vessel size or regulating the design of other equipment). In 1990, the SCOQ fisheries adopted an ITQ system under which the fishery regulator sets a total allowable catch (“TAC”) separately for each of the two species to prevent over-exploitation of the resource, and allocated ITQs permitting harvest of a share of the TAC (the body of this report provides details about how the program is administered). ITQs are transferable, which allows shifts in production to industry participants that may be more efficient and, consequently, that value the quota more highly than the original owner. Participants in the fishery report that there are various types of transactions involving ITQs that commonly occur, including permanent ITQ transfers, long-term ITQ leases (e.g., five years), and transfers of bushel tags.¹

Currently, there are eight processing firms that purchase catch from the SCOQ fisheries. Some processors have developed quota ownership through either the acquisition of vessels and accompanying quota or the acquisition of quota directly, and it is common for processors to enter into long-term contracts (e.g., five years or more) to lease quota from quota holders. Processors also enter into exclusive contracts with vessel owners to harvest clams. Processors aim to meet the schedules set by their customers, many of which are large consumer goods companies, such as Progresso or Campbell’s, or large food service companies, such as Sysco. A consequence of the need to harvest and process clams to meet a schedule is that virtually all clams are sold under contract between processors and harvesters, or are harvested by processor-affiliated vessels.

¹ Excessive Share Technical Meeting, October 22, 2010.

C. Market Power and Competition in ITQ-Regulated Fisheries

This report addresses the question of whether market power can be exercised through the ownership and withholding of quota in the SCOQ fisheries. The exercise of market power in an ITQ-regulated fishery can occur when a quota owner has the ability and the incentive to affect the price of the regulated harvest or of the quota through its use or suppression of use of quota. When the incremental quota transactions of a harvest seller affect the price the quota owner receives for its entire quota holdings, the quota owner may have the incentive to withhold quota to increase the market price. When incremental quota transactions of a harvest buyer affect the harvest price, the quota owner may have the incentive to withhold quota to decrease the harvest price. Furthermore, firms may have an incentive to withhold quota in order to foreclose competitors from the market.

The regulation of market power requires a trade-off between potentially increasing efficiency by controlling market power and potentially reducing efficiency by over-regulating market transactions. In the SCOQ fisheries, an overly restrictive cap could limit the growth of an efficient firm when there is no material threat of the exercise of market power. Furthermore, conditions in the fisheries have changed over time and will change in the future. Thus, a share cap established at an appropriate level could over time become inefficiently high or low.

The U.S. Department of Justice and the Federal Trade Commission (“Agencies”) have responsibility in the United States for determining if a proposed merger would threaten competition. The *Horizontal Merger Guidelines* helps firms know whether their merger is likely to be opposed by the Agencies. The *Horizontal Merger Guidelines* describes market concentration thresholds (for sets of products or services determined to be together in a relevant market) and other considerations that, if satisfied, would indicate that a merger is unlikely to create market power. A standard measure of the level of concentration is the Herfindahl-Hirschman Index, or HHI.² Based on thresholds described in the *Horizontal Merger Guidelines*, markets with HHIs below 1500 are considered unconcentrated; markets with HHIs between 1500 and 2500 are considered moderately concentrated; and markets with HHIs greater than 2500 are considered highly concentrated.³ The *Guidelines* also describes the methods the Agencies use to evaluate the competitive impact of proposed mergers.

Levels of concentration vary in the different sectors of the SCOQ industry: quota ownership, harvesting, and processing. Since the initiation of the ITQ system and quota allocation to the vessel owners participating in the SCOQ fisheries, a number of quota owners have sold their quota permanently and left the fisheries. Despite the exit of some

² The HHI is equal to the sum of the squared market shares of the participants in the market. Thus, if there are three firms with shares of 50 percent, 30 percent, and 20 percent, the HHI is equal to 3800 ($3800 = 50^2 + 30^2 + 20^2 = 2500 + 900 + 400 = 3800$).

³ See U.S. Department of Justice and the Federal Trade Commission, *Horizontal Merger Guidelines*, August 19, 2010, p. 19.

quota owners from the fisheries, the ownership of quota in the SCOQ fisheries is unconcentrated, but the use of quota is highly concentrated. An NMFS study found that the HHI of ownership of Surfclam quota in 2009 was 1167, and the HHI of ownership of Ocean Quahog quota was 993.⁴ NMFS has also conducted an analysis of quota usage by examining records showing the harvest amounts for vessels in the SCOQ fisheries and tracing their ownership. The HHI of harvesting activity for Surfclams in 2008 was 4080 and the HHI of harvesting activity for Ocean Quahogs was 2653. The HHI of harvesting activity for SCOQ combined was 2890.⁵

NMFS data also show that the concentration of harvesting has risen substantially in the last decade, largely as the result of the backward integration of clam processors into harvesting. The processing sector itself has also changed. In 1979, there were 44 plants that processed either Surfclams or Ocean Quahogs.⁶ Today, there are 12 plants.⁷ The HHI of purchases by processors grew between 2003 and 2008 from 2068 to 3134 for Surfclams and from 3431 to 4369 for Ocean Quahogs.⁸

It is possible for market power to be created or exercised at any of these stages of activity through a variety of means. Our analysis here, however, is targeted at the possibilities for the creation or exercise of market power specifically through the ownership or contractual control of quota. Large holdings of quota, whether amassed through permanent transfers of quota allocation, long-term leases of quota, or annual purchases of bushel tags, raise the risk that large quota holders will be able profitably to withhold quota and raise the price of clams and of quota. However, different types of ownership and control have different implications for the likelihood that a large quota holder could profitably exercise market power.

There are a number of factors that may constrain the exercise of market power throughout the various levels of activity in the SCOQ fisheries. For example, if it were the case that demand were highly elastic and substitutes were amply available, then small changes in price would lead to large changes in the quantity demanded. The demand for quota is ultimately derived from the demand for clam products and, therefore, demand for quota would then be elastic as well. Then, large reductions in output caused by price

⁴ Social Sciences Branch of the Northeast Fisheries Science Center, “Excessive Share Issues in the Surfclam and Ocean Quahog ITQ Fishery,” Report to the Surfclam and Ocean Quahog FMAT, August 12, 2009, p. 12. As discussed in detail in this report, the available data may not always clarify ownership sufficiently to determine shares correctly.

⁵ NMFS Data.

⁶ The available data do not report the number of firms operating these plants (“Amendment #3 to the Fishery Management Plan for the Surf Clam and Ocean Quahog Fisheries and Supplemental Environmental Impact Statement,” April 1981).

⁷ Mid-Atlantic Fishery Management Council in cooperation with the National Marine Fisheries Service, “Overview of the Surfclam and Ocean Quahog Fisheries and Quota Considerations for 2010,” May 2009.

⁸ NMFS Data.

increases would generally limit the potential for the significant exercise of market power (because moving the market price substantially would require withholding, without revenue, a large quantity). Also, processors sell to large buyers, whose possible options to switch supply sources would constrain price increases for clam meat from the SCOQ harvest (and, consequently, would constrain prices for the SCOQ ITQ). Additional important factors may include the existence of excess unused quota (held in small accumulations) and excess harvesting and processing capacity.

D. Conclusions Regarding Market Power in the Fisheries

The evidence we analyzed does not support a conclusion that market power is currently being exercised through withholding of quota in the SCOQ fisheries.⁹ In particular, processors report that once it is clear that there will be excess quota available in a season (well before the end of the season, leaving sufficient opportunity to continue to harvest if harvesters and processors deem there to be sufficient demand), the price of quota is very low. This is inconsistent with the exercise of market power based on quota holdings.

E. Excessive-Share Guidelines

The excessive-share proposal is laid out as a series of steps in Table ES-1. These steps allow for the possibility that, under some circumstances that can be objectively assessed, the appropriate excessive-share cap is 100 percent. If it can be shown that ownership of all of the quota were to pose no risk for the exercise of market power, then the appropriate regulations would be no regulation at all. This does not appear to be the case for the SCOQ ITQ system under current conditions, but it is a valid theoretical possibility for ITQ programs in general.

F. Issues for Additional Consideration: Open Auction(s) for ITQ Sponsored by the Regulators

Our recommendations depend on conclusions and assumptions that are in some instances guided by the limited body of information provided to us by industry participants. Additional information could be useful for optimal administration of the fisheries. For example, information on the value of quota expressed in short-term (“spot”) ITQ transaction prices in an efficient, liquid market would be an excellent source of objective evidence that would aid in managing the fisheries. In the current circumstances, such evidence could validate claims that quota have low value and are not being withheld from the market despite harvests below the TAC. It also happens to be the case that spot ITQ transaction prices could be beneficial to industry participants in general, and in particular to small quota holders that likely have less information on the value of quota than larger holders engaged in many quota transactions. One way to provide accurate price signals to the market and to the regulators is for the regulators to sponsor an open auction during each season for a modest portion of the rights to harvest

⁹ We do not analyze whether market power is exercised through the withholding of harvesting or processing, or through exclusionary conduct other than conduct involving quota ownership.

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Mitchell, Peterson and Willig. May 3, 2011.

TAC from each fishery. Details for the design and implementation of such an auction would require additional economic analysis not covered in the scope of this report.¹⁰

¹⁰ See U.S. Department of Commerce, *The Design and Use of Limited Access Privilege Programs*, Lee G. Anderson and Mark C. Holliday, eds., NOAA TM NMFS-F/SPO-86, pp. 124-135.

Table ES-1:

Step 1: Assess availability of requisite information on quota ownership and control	The regulator must be able to define clearly what constitutes relevant ownership and control of ITQ shares, accurately calculate existing levels of quota holdings and concentration, and be able to identify the quota owners and their affiliations that create aligning interests.	The Council must be able to determine which entities are affiliated and then accurately assess quota holdings and transactions.
Step 2: Assess availability of requisite competitive information	The relevant information to be collected includes the scope and quantity of substitute products, the level of excess capacity, the degree of product heterogeneity, the relative bargaining power of buyers and sellers, the ability to price discriminate, ease of entry, and efficiencies (or economies of scale).	The Council must determine the relevant markets and have access to other information about competitive constraints.
Step 3: Establish whether threshold condition requiring no calculation of cap applies	A TAC sufficiently restrictive to remove any incentive to withhold quota would obviate the need for an excessive-share cap. The relevant “sufficiently restrictive” level is the quantity that would be produced if there were only a single entity producing in the industry – the “monopoly” output.	The TAC in each of the SCOQ fisheries does not restrict output in a competitive market, so TAC is not below the monopoly output.
Step 4: Establish appropriate concentration thresholds	Use the information on competitive constraints to determine an appropriate concentration condition under the analytical framework of the <i>Horizontal Merger Guidelines</i> , and to guard against the possibility of the foreclosure of competitors.	Prevent a relevant product market HHI from exceeding 2500 and ensure independent harvest supply sufficient to support at least three efficient processors.
Step 5: Determine relationship between the excessive-share cap and market concentration	Assess concentration of substitute products and size of competitive fringe; calculate maximum number of quota allocations that can exist at the cap; include one additional quota holding that captures remainder; and calculate the HHI for the resulting set of relevant market shares. It may be possible to meet the concentration conditions set in Step 4 even when share ownership is very highly concentrated or 100 percent, depending on the breadth of the market, the size of the fringe, and the sources of supply to processors.	To apply these calculations first requires the determination of relevant markets. Figure 13 illustrates calculations under various assumptions.
Step 6: Identify regulatory and practical constraints	An appropriate cap for one set of market conditions may be too high or too low under other conditions – how to address this depends on legal and practical constraints.	Two options: fixed cap or two-part cap with flexible short-term holdings.
Step 7: Set the excessive-share cap	Identify the excessive-share cap based on the first six steps; exempt current large holdings, but do not allow them to grow further.	Fixed cap at 30-40%; two-part cap at 30% for long-term and 40-60% for short-term.

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I. Introduction

A. Statement of Work/Terms of Reference

We have been asked to give independent advice to the National Marine Fisheries Service (“NMFS”) and the Mid-Atlantic Fishery Management Council (“Council” or “MAFMC”) on determining how, in order to protect against market power without constraining the workings of competition, to set an excessive-share limit in individual transferable quota (“ITQ”) systems in general, and in the Surfclam and Ocean Quahog (“SCOQ”) fisheries in particular. Specifically, the NMFS has requested the following:

Using the rule prescribed under the "U.S. Department of Justice Horizontal Merger Guidelines" or another accepted rule if appropriate for determining market power, describe a process or rule that will allow for a theoretically sound procedure to specify the maximum possible allowable percentage share of quota ownership that will prevent an entity from obtaining market power. This can include market power (monopoly/oligopoly) in the final product market, the input market (monopsony/oligopsony) for the fishery resource, or the quota share market. If market power already exists in any of these markets, describe a process or rule that will allow for a theoretically sound procedure to prevent market power from increasing.¹¹

This report provides our recommendations on: 1) an operational rule or process that could be used to set an excessive-share limit in terms of the maximum percentage of quota that can be owned or otherwise controlled by a single individual or entity; and 2) application of this rule or process using available data to determine an appropriate excessive-share limit in the SCOQ ITQ system.

The recommendations presented in this report are based on the economic analysis of the SCOQ fisheries. The underlying economic principles regarding market power are the same for other fisheries, but the application of the principles may need to be modified to address different circumstances or additional market power issues that may arise.¹² Our recommendations allow for the possibility that, under some circumstances that can be objectively assessed, the appropriate excessive-share cap is 100 percent. If it can be shown that ownership of all of the quota were to pose no risk for the exercise of market power, then the appropriate regulations would be no regulation at all. This does not appear to be the case for the SCOQ ITQ system under current conditions, but it is a valid theoretical possibility for ITQ programs in general.

¹¹ Statement of Work for Independent Experts to Provide Advice on Setting of an Excessive Share Limit in the Surfclam/Ocean Quahog ITQ Fishery.

¹² For example, different species harvested from a multi-species fishery might face substantially different levels of competition from competing species and fisheries. The establishment of an appropriate excessive-share rule would have to take the competitive circumstances for the different species into account.

B. Consultant Roles and Biographies

The report was prepared and written under the direction of Professor Robert Willig. Dr. Steven Peterson and Dr. Glenn Mitchell drafted the report and performed the economic analyses underlying the report and its conclusions.

Dr. Robert Willig is Professor of Economics and Public Affairs at the Woodrow Wilson School and the Economics Department of Princeton University. Earlier, he was Supervisor in the Economics Research Department of Bell Laboratories. His teaching and research have specialized in the fields of industrial organization, government-business relations, and welfare theory. From 1989 to 1991, Dr. Willig served as Deputy Assistant Attorney General for Economics in the Antitrust Division of the U.S. Department of Justice, where he led the development of the 1992 *Horizontal Merger Guidelines*. Dr. Willig is the author of *Welfare Analysis of Policies Affecting Prices and Products*, *Contestable Markets and the Theory of Industry Structure* (with William Baumol and John Panzar), and numerous articles on subjects including merger analysis, IO theory, and merger guidelines. Dr. Willig is also co-editor of *The Handbook of Industrial Organization*, *Can Privatization Deliver? Infrastructure for Latin America*, and *Second Generation Reforms in Infrastructure Services*, and has served on the editorial boards of *The American Economic Review*, *The Journal of Industrial Economics* and the MIT Press Series on regulation. He is also an elected Fellow of the Econometric Society and an Associate of The Center for International Studies. Dr. Willig has served as a consultant and advisor for the Federal Trade Commission and the Department of Justice on antitrust policy; for OECD, the Inter-American Development Bank, and the World Bank on global trade, competition, regulatory and privatization policy; and for governments of diverse nations on microeconomic reforms. He has advised many corporations on antitrust and regulatory issues, and on pricing, costing, and business organization.

Dr. Steven Peterson is a Senior Vice President with Compass Lexecon and is based in Boston, Massachusetts. He specializes in the economics of antitrust and competition, estimation of damages, and regulation and public policy. In his antitrust work, Dr. Peterson has consulted with clients engaged in negotiations with the U.S. Department of Justice and customers to resolve allegations of price-fixing in both the United States and Europe, and he has evaluated the competitive impact of proposed mergers. Dr. Peterson has consulted extensively in regulated industries, including regulation of common-pool resources. Dr. Peterson consulted extensively with British Petroleum addressing the Prudhoe Bay Unit operating agreement and whether the unit interest owners' interests were sufficiently aligned under the agreement to avoid waste in the production of oil and gas from the unit. Dr. Peterson has also consulted on competition issues related to the transfer of slots (landing rights) between Delta Air Lines and U.S. Airways at LaGuardia Airport and Reagan National Airport. This work addressed the competitive effects of the proposed transaction and the liquidity of the market for slots at slot-controlled airports in the United States. Dr. Peterson has a Ph.D. in economics from Harvard University and a B.A. with highest honors in economics from the University of California, Davis.

Dr. Glenn Mitchell is an expert in the application of microeconomics and statistics to the analysis of competition, regulation, asset valuation, and transfer pricing. He has provided testimony for regulatory review of environmental and transportation matters, and for civil action relating to allegations of securities fraud. In the area of competition analysis, Dr. Mitchell has provided consulting services for matters involving allegations of restraint of trade, including monopolization, vertical restraints (in the United States, Europe, and Asia), tying, exclusive dealing, collusion, and predatory pricing; and he has extensive experience with regulatory review of mergers and joint ventures in the United States and Europe. Additionally, he has conducted transfer pricing studies; analyzed the regulation of greenhouse gas emissions; calculated of lost profits and reasonable royalties related to allegations of patent infringement; and prepared valuations of non-traded goods and services, as well as intangible assets. Dr. Mitchell holds a Ph.D. and an M.A. in economics from the University of California at Santa Barbara (where he received a Jacob Javitz Fellowship from the Department of Education, and a Transportation Economics Award from the Western States Coal Association), and he has a B.A. in economics with highest honors from the University of California at Davis. He has a research background in applied microeconomics, environmental and natural resource economics, econometrics, industrial organization, and finance. Specific research topics include energy and technological development, resource valuation, and markets for tradable pollution allowances. He has also taught economics as an Adjunct Professor at the University of Southern California Marshall School of Business.

C. Overview

Section II provides a brief summary of relevant facts about fisheries in general and the SCOQ fisheries in particular. We then discuss the concept of market power in Section III, along with the economics of regulating the exercise of market power. In Section IV, we provide some detailed analysis of industry structure of the SCOQ fisheries, and in Section V we analyze the ways that market power might be exercised in the SCOQ fisheries as well as existing competitive constraints that currently serve to prevent or limit the exercise of market power. We then conclude in Section VI with our proposed guidelines for defining an excessive-share cap and the application of those guidelines to the SCOQ ITQ system.

II. Background on the Surfclam and Ocean Quahog Fisheries and on the Clam Processing Industry

A. The Fisheries

Surfclams and Ocean Quahogs are bottom-dwelling species of clams that are harvested off the eastern coast of the United States. The Surfclam fishery has been active for longer than the Ocean Quahog fishery, which has been developed more recently in part to encourage an alternative to Surfclams and ease potential pressure from over-harvesting.¹³ Ocean Quahogs differ from Surfclams in that their habitat lies further from shore and the harvested clams tend to be smaller.

¹³ Communication with NMFS personnel.

Both species are harvested using boats equipped with hydraulic dredges that pump water to disturb the seabed and uncover the clams. Surfclam and Ocean Quahog harvesting areas cover a broad area off the East Coast of the United States, from the Mid-Atlantic states up into New England. The range of clam population areas is wide enough to support processing activities in several states. In recent years, harvesting activity has shifted northward following changes in clam population densities, which has resulted in some shifts in the location of processing plants.

Some vessels operate in both the Surfclam and the Ocean Quahog fisheries. This indicates that vessels will harvest in the fishery that offers the higher return to time and effort. Surfclams yield more meat per bushel of clams than do Ocean Quahogs. As a result, the per-bushel price of Ocean Quahogs is lower than the per-bushel price of Surfclams. The prices are more comparable, however, if they are adjusted for the meat yielded by each bushel.

Ocean Quahogs provide a substitute product for Surfclams for some, but not all, post-processing uses. Imports of other clam species also provide a substitute for some uses (and a small portion of the domestic Surfclam and Ocean Quahog harvest is exported). Processors report competition from imported clams from a number of countries, including Canada, Thailand, Chile, and others.¹⁴

For both of these species, population growth is relatively unrelated to existing population. Because of this, federal regulation is targeted to limit harvesting to the level where each species could be expected to continue to be harvested at a constant rate for a given number of years. There are also state-regulated clam fisheries that are closer to shore than the federally regulated fisheries. Fluctuations in environmental conditions can depress clam spawning and inhibit population growth and replenishment. When conditions cause populations to become substantially depressed, regulators tighten regulations or close the clam fisheries until the population can stabilize.

B. Regulation of the Surfclam and Ocean Quahog Fisheries

Fisheries are a well known example of a common-pool resource. This is a resource, such as a fishery or a commonly grazed field, where there is no limitation on who may use the resource or on the intensity of use. The likely result of free entry into the exploitation of the resource, however, is that the resource will be overexploited, which, in economic terms, will be inefficient.¹⁵ Each party using the resource considers only the benefit it will receive and the private cost of obtaining that benefit. The resource

¹⁴ Excessive Share Technical Meeting, October 22, 2010; written responses from processors. Imported processed meat provides competition for the products supplied by processors to end use customers, but not for the supply of clams harvesters supply as input to processors.

¹⁵ The term “efficiency” has a specific economic meaning. When goods and services are allocated efficiently, it is not possible to re-allocate them so that at least one party is better off without making anyone else worse off. An equivalent definition is that the marginal benefit of output (the value to society of an incremental increase in output) is equal to the full marginal cost of producing the output (including costs borne by all participants, not just the producer).

users do not consider the negative effect of their use on other users of the resource. Obviously, a fish caught by one fisher cannot be caught by another. Therefore, each user has a negative effect on the productivity of the efforts of other users.¹⁶

A fishery is also a renewable resource. When there is no fishing activity, the fish stock will grow to the point where there is insufficient food or resources for the stock to grow further. The growth rate of the stock each year at such a state would be zero. When fishing activity removes part of the stock of fish each season, the stock of fish may decline, depending on how quickly the remaining stock can grow and replenish itself. Equilibrium occurs when the harvest rate each season is equal to the rate at which the stock replenishes itself.

Open access creates incentives for fishers to expend too much effort individually than the effort that would (in the aggregate) maximize the economic return on the fishery. This can lead to overfishing, meaning that the fish stock has been reduced to a level where the annual catch is lower than could be achieved (with the same or less effort) were stocks allowed to rise.¹⁷

To address the oversupply of fishing effort in open-access fisheries, it is common to regulate them by limiting entry or regulating fishing effort. This was the case for the SCOQ fisheries. Heavy fishing pressure in the 1960s and 1970s led to depleted stocks.¹⁸ The regulatory response was to declare a moratorium on new entrants into the fisheries in 1977. The moratorium kept the number of boats operating in the fisheries roughly constant, but did allow vessel owners to replace boats with newer vessels having greater fishing capacity (thereby allowing fishing effort to continue to rise).¹⁹ In 1990, regulators replaced the moratorium with an ITQ program to cap the SCOQ harvest.

Under the ITQ program, regulators set the total allowable catch (“TAC”) separately for Surfclams and for Ocean Quahogs. The program allocated quota to vessel owners that had permitted vessels operating in the fisheries between 1970 and 1988, allowing each to harvest a share of the TAC. Different formulas were used in different regions and for Surfclams and Ocean Quahogs, but the primary factor used to determine the initial allocations of quota was the average catch of each vessel during eligible

¹⁶ See, e.g., Gordon, H. Scott, “The Economic Theory of a Common-Property Resource: The Fishery,” *The Journal of Political Economy*, Vol. 62, Issue 2, April 1954.

¹⁷ For a discussion of these issues see National Research Council, *Sharing the Fish, Toward a National Policy on Individual Fishing Quotas*, 1999 (hereinafter “Sharing the Fish”), pp. 22-23; Clark, Colin W., *Mathematical Bioeconomics: The Optimal Management of Renewable Resources*, Second Edition (New York: John Wiley & Sons, Inc. 1990), Chapter 2. The definition of overfishing varies.

¹⁸ *Sharing the Fish*, p. 60.

¹⁹ *Sharing the Fish*, p. 61.

years.²⁰ The quota are transferable; shares of TAC may be sold or leased to other fishers (or to anyone, although only licensed vessel owners can harvest in the SCOQ fishery).

Quota holders each have control over a share of the fishery's TAC (under the regulations, ITQ is not an actual property right and can be revoked by changes in the regulations). The fishery is no longer open access, and harvesting rights for those active in the fishery are strictly limited. Under these circumstances, each vessel owner has the incentive to harvest its share of the TAC as efficiently as possible. This means that if one vessel owner has a larger, more efficient vessel than another ("more efficient" means lower cost per unit of harvest), the more efficient vessel owner may value quota more highly than the other. Under these circumstances, both parties can gain by temporarily or permanently transferring quota to the more efficient vessel owner.

To the extent that there is economic rent for the SCOQ resource ("economic rent" is the social value in a scarce fishery resource above and beyond the production cost of harvesting the resource), under the ITQ program such rents flow to the owners of the quota. In an economically efficient ITQ fishery, harvesting capital, vessels, and labor (the "factors of production") should earn competitive returns and competitive wages, and quota holders should receive the additional benefit of economic rents. The *distribution* of wages and economic rents among the industry participants, which can be of interest to social planners and industry participants (and the focus of economic research), is not analyzed in this report. To assess the risk of market power and the use of an excessive-share rule to control quota-based market power in the SCOQ fisheries, it is only relevant that the factors of production make competitive returns and that quota holders receive no more than the competitive economic rents from the resource.

The use of quota in the SCOQ fisheries is administered as follows. The regulator has a list of ITQ owners along with the share of harvest allocated to each. This list is updated as ITQ owners transfer their shares (transfer reporting is mandatory). Each season, the regulator calculates the actual harvest associated with each share by multiplying the share by the TAC that has been set for the season. The regulator then issues to each quota owner numbered bushel tags in accordance with the owner's share of the allowed harvest. When the vessel operators bring harvested clams to shore, they must provide sufficient tags to cover the bushels of clams harvested. Participants in the fishery report that there are various types of transactions involving ITQ that commonly occur, including permanent ITQ transfers, relatively long-term ITQ leases (i.e., five or more years), and transfers of bushel tags.²¹

²⁰ In some regions, vessel capacity was also used to establish initial quota holdings (Sharing the Fish, p. 63).

²¹ Excessive Share Technical Meeting, October 22, 2010.

C. The Processing Sector

Currently, there are eight processors that purchase catch from the SCOQ fisheries. All of them process Surfclams, but only four process Ocean Quahogs.²²

Processors were not directly incorporated into the initial allocation of quota, although processors owning licensed vessels did receive the allocations associated with those vessels. Over time, some processors or processor affiliates have developed quota ownership through either the acquisition of vessels and accompanying quota or the acquisition of quota directly, and it is common for processors to enter into long-term contracts (five years or more) to lease quota from quota holders. Processors also enter into exclusive contracts with vessel owners to harvest clams. In these cases, either the vessel owner or the processor may be responsible for supplying quota for the catch.²³

Processors aim to meet the schedules set by their customers, many of which are large consumer goods companies, such as Progresso or Campbell's, or large food service companies, such as Sysco. This means that processors must be able to direct vessels to harvest at certain times, weather permitting. These scheduling requirements mean that it is not generally possible for a vessel to harvest for more than one processor and still meet the scheduling needs of the processors.²⁴ Vessels must have quota at the time they harvest clams. Therefore, processors or fishers must arrange for the quota that the vessels require prior to leaving port.

A consequence of the need to harvest on a schedule is that virtually all clams are sold under contract between processors and harvesters or are harvested by processor affiliates. Therefore, processors do not "post" a price that they are willing to pay for clams at unloading points. There is no "spot" market for Surfclams or Ocean Quahogs.²⁵

III. The Economics of Market Power

A. What Is Market Power?

In perfectly competitive markets, participants act as if their levels of purchases or sales in the market do not influence the equilibrium market price. The result of competition in such a market is that sellers will expand their output (driving prices down) until the market price no longer covers the cost of further expansion. Similarly, consumers will increase their purchases (driving prices up) until the market price exceeds the benefit of further purchases. The price that brings supply and demand into balance in these circumstances is the competitive price and there are no further gains from trade – the purchasers' costs to expand output further would exceed the consumers' benefit from additional supply.

²² NMFS Data.

²³ Excessive Share Technical Meeting, October 22, 2010.

²⁴ Excessive Share Technical Meeting, October 22, 2010.

²⁵ Processors buy unprocessed clams from one another when there are equipment breakdowns or other unusual events, but such purchases are rare.

Figure 1 shows the market equilibrium in a perfectly competitive market. The downward sloping demand curve indicates the amount that consumers are willing to pay for the good for each output level. Similarly, the upward sloping supply curve shows the cost that competitive suppliers must be paid to bring the indicated quantity to market. Equilibrium occurs at the price, P_C , where the amount supplied equals the quantity demanded, Q_C .

In less competitive markets, some market participants may recognize that the level of their sales or purchases influence market price. Sellers large enough for their increased output to lower the price of their entire market output each have a unilateral incentive to withhold supply from the market (and elevate price above the competitive level). Figure 2 shows a market where a firm has withheld supply from the market. The market price, $P_{MKT PWR}$, is above the competitive level, and output, $Q_{MKT PWR}$, is below the competitive level. This is inefficient because buyers would be willing to pay more than enough to cover the cost of increased output: consumers' willingness to pay (as indicated by the height of the demand curve) exceeds the cost for producers to expand output (as indicated by the height of the supply curve). The exercise of market power restricts the gains from trade to less than would be realized in a competitive market.

For sellers in a market to have market power, it must be the case that the sellers can withhold supply without that supply being replaced by other firms in the market or by entry of new firms into the market. Under normal circumstances the high prices that could be generated by withholding supply would attract new firms to the market. This is relevant to the market for quota because regulators fix the amount of quota available (by setting the TAC). Therefore, if a firm (or firms) were to withhold quota, additional quota might be forthcoming from small, unconsolidated quota owners, but industry participants cannot "produce" additional quota – there can be no entry or expansion into the market for quota to offset the effects of withholding.²⁶

It is also possible for buyers to exercise market power. Just as a large seller may recognize the effect of its purchases on the market price of its product, a large buyer may recognize the elevating effect of its purchases on market price. In this case, the buyer will recognize its effect on price and will, therefore, have the unilateral incentive to reduce its purchases of the input in order to reduce the market price of the input *below* the competitive level.

The creation or exercise of market power can involve conduct more complex than withholding supply from the market. Certain types of "exclusionary" or "predatory" conduct might create barriers to entry or foreclose competitors from a market. Such conduct may not provide an immediate benefit and is likely to be costly, but may eventually pay off if firms reasonably expect to benefit from consequently reduced competition in the long run. Since ITQ holdings are by their nature exclusionary (there is a fixed supply, so a market participant holding one unit of quota prevents any other participants from relying on that unit for production), assessment of market power must

²⁶ There may, however, be entry or expansion in the market for clam meats or clam products.

include a long-term assessment of the potential for exclusionary conduct through the withholding or manipulation of ITQ supply.

B. Market Power in an ITQ-Controlled Fishery

A fishery regulated by an ITQ program presents some unique issues for the analysis of market power. As described above, the exercise of market power requires withholding supply from the market in order to raise prices (and, in some cases, other conduct that will eventually lead to the ability to affect price by withholding supply). If the total supply for a market comes from an ITQ-regulated fishery, the regulation of the fishery itself may limit supply. This is illustrated in Figure 3. The figure shows the demand for fish from a fishery and the supply of fish from the fishery. The vertical line represents the maximum harvest, or TAC, established by the regulators of the fishery. In this case the TAC is below the competitive market output level. Therefore, the TAC is a “binding” constraint on output. The market price is equal to P_{TAC} , which is above the competitive price. The market price is also above the cost of bringing additional fish to market, as indicated by the height of the supply curve where it intersects the vertical line where output equals TAC, or C_{TAC} .

The regulated outcome for the market as a whole is similar to the outcome that results from the exercise of market power – lower quantity and higher price than the competitive equilibrium. In this case, however, the restriction on output comes from the regulation of the fishery rather than from the exercise of market power by fishers or quota holders. The exercise of market power can involve an economically inefficient withholding of supply, but regulation limiting the fishery’s harvest can actually increase efficiency by limiting excessive fishing effort. In the market outcome illustrated in Figure 3, the right to fish is valuable. The value to a small harvester of additional quota to bring one more unit of fish to market as shown on the graph is the difference between the market price of fish and the cost of bringing more fish to market. This is the difference between P_{TAC} and C_{TAC} .²⁷

The output of a fishery could be below the TAC, with or without the exercise of market power. If demand for the output of a particular fishery is low, the TAC may exceed the competitive catch. In this case, competitive forces limit the output of the fishery rather than regulation. Under these circumstances, the regulation is not “binding” because it does not limit the harvest from the fishery. This result is illustrated in Figure 4. The figure shows that the equilibrium price of fish, P_C , and the cost of

²⁷ A large harvester would recognize the negative effect of the additional catch on the price it received for its entire harvest and would place a lower value on the quota. Note that a firm may have market power in the fishery illustrated in Figure 3. The outcome shown will occur whenever the TAC is below the equilibrium output, whether it would reflect market power or not. See Anderson, Lee G., “The Control of Market Power in ITQ Fisheries,” *Marine Resource Economics*, Vol. 23 (hereinafter “Anderson”), pp. 25-35.

harvesting additional fish (as indicated by the height of the supply curve at the equilibrium quantity) are the same, so the value of quota in this example would be zero.²⁸

Alternatively, it could be the case that the TAC does not bind and that participants in the fishery (which could be quota holders in the case of an ITQ-regulated fishery) are withholding supply to raise prices. This outcome is illustrated in Figure 5.²⁹ One difference from the competitive equilibrium situation described above in Figure 4, however, is that in the situation illustrated in Figure 5, the unused quota has value to a small harvester (because the market price for each unit harvested still exceeds the cost of harvesting an additional unit). The value of quota to a small harvester is the difference between the price of fish and the cost of harvesting additional fish and is labeled in the figure.

Comparison of these cases illustrates a possible effective metric for identifying market power in the SCOQ fisheries. When the harvest in a season will clearly fall below the TAC (but while there is still time to harvest additional clams), then the price of quota sold for a single season is a good indicator of market power. If the harvest is below the TAC in a season because of low demand for the output of the fishery, quota do not restrict the catch, and the value of quota for the season should be essentially zero.³⁰ Alternatively, if the harvest is low as the result of the withholding of quota, the price of quota will be positive.

C. Regulating Market Power in ITQ-Regulated Fisheries Using an Excessive-Share Cap

Having access to a fishery with output limited by regulation is valuable when the regulation restricts competition from expanding output and eroding profits or rents from harvesting. Access to an ITQ fishery is controlled by access to tradable quota, so rents would be expected to flow not to vessel owners but to quota owners. In an ITQ-regulated fishery, the stream of rents attributable to access to the fishery have been severed from

²⁸ The price of quota may be greater than zero in a real-world fishery with excess quota because there may be uncertainty at the beginning of the season as to whether there will, in fact, be excess quota at the end of the season. Moreover, harvesters must purchase quota. In a real-world fishery, no quota holder has any incentive to sell quota to a harvester for a price so low as to not even cover transactions costs and the time involved in the sale. These considerations indicate that when harvests are generally below the TAC, the price of quota may be positive, but should be quite low.

²⁹ Figure 5 shows the TAC set at a level greater than the competitive equilibrium. It could also be the case that the TAC is below the competitive equilibrium but greater than the equilibrium output with market power.

³⁰ The price of quota will be essentially zero for all quota that are available for lease in the market. However, the price of quota traded under previously struck, long-term contracts may be quite different (because the price in a long-term contract may be based on expectations about the value of quota at the time the contract is struck). Prices may also vary throughout the season. If there is an expectation at the beginning of the season that demand will exceed the available quota, prices at the beginning of the season may be high and later fall when it becomes clear that quota will, in fact, exceed demand.

the actual harvesting of fish. The incentive for quota owners (which can include parties otherwise not participating in the fishery other than through quota control) is to maximize the stream of income they can earn from their quota holdings.

Two incentives could induce quota owners to withhold quota from the market to increase the value of their quota. First, by withholding quota, the output of the fishery will be decreased, raising the price of fish, and all else equal, increasing the value of quota. This is standard seller market power: withholding the supply of quota raises the price of fish and of quota. However, a quota owner may also be a buyer of harvesting services. If a large quota owner were to contract with vessel owners to harvest fish, the quota owner may recognize that its purchases of harvesting services increase their price. In such an instance, the quota owner would reduce its purchases of harvesting services to avoid running up their price, and withhold quota from the market to prevent other processors from competing to purchase those services. Of course, both of these effects (withholding to increase the value of the resource vs. withholding to decrease the demand for harvesting) may occur at the same time.³¹

Another concern is that a large quota owner could withhold quota from a processor and foreclose competition from that harvester by making it impossible or too expensive for the harvester to obtain clams to process (withholding to decrease competition in processed fish). Such a strategy is more complicated than the straightforward exercise of market power described above and may not be profitable in the short run. However, a strategy to withhold quota to foreclose competition from other processors (or harvesters) can be profitable if prices can be raised once the competition has been eliminated.

An excessive-share cap operates by limiting the amount of quota that any quota owner can hold. Small quota owners cannot effectively raise the price of quota through withholding because if a small quota owner were to engage in costly withholding of even a large share its quota, the effect on the market price would be small, and the withholding would be unprofitable for the small quota owner. A similar argument holds for attempts by quota owners to exercise monopsony power over harvesters. An excessive-share cap can also limit the ability of a quota holder to foreclose competition because a sufficiently low cap will guarantee that a minimum number of quota holders will exist.³²

1. The Regulation of Market Power

The justification for regulating market power is that the exercise of market power hurts consumers and causes economic inefficiency. Some industries are subject to direct regulation and all are subject to the scrutiny of the antitrust laws, which forbid anticompetitive conduct that creates or perpetuates significant monopoly (market) power. Antitrust laws also forbid mergers that will significantly weaken competition and increase the market power of the merging parties. An ITQ excessive-share rule would be

³¹ See Anderson.

³² For example, an excessive-share cap of 40 percent guarantees there will be at least three quota holders.

related to this category of regulation because it would restrict some purchases or control transactions of quota by large quota holders.

The government has an interest in controlling the exercise of market power through control of quota. In the SCOQ fisheries, the government created fishing rights to regulate and improve the efficiency of the fisheries. The government, therefore, has an interest in seeing that the ownership of rights that it created does not become the mechanism through which participants in the fisheries consolidate market power to the detriment of consumers and to the detriment of the efficiency of the fishery. The exercise of market power through ownership of quota is directly counter to the goal of creating quota to enhance the efficiency of the fisheries.

2. A Share Cap Is Potentially a Blunt Instrument

Regulating market power, however, is not without its own hazards, because it imposes limits on what firms can do. These limits may be inefficient in their own right if they proscribe efficiency-enhancing activities or transactions. Regulation may require a trade-off between potentially increasing efficiency by controlling market power and potentially reducing efficiency by over-regulating market transactions.

An excessive-share cap may limit the growth of firms in the SCOQ fisheries.³³ Regulations that limit the size of firms may also limit the growth of efficient firms, which may lower the overall efficiency of the harvesting and processing activities in the SCOQ fisheries. An overly restrictive cap could limit the growth of an efficient firm when there is no material threat of the exercise of market power. This is just one example of how an efficient rule must balance the costs of the regulation with the potential benefits.

Restricting the regulatory consideration to an excessive-share rule precludes many options for achieving an efficient balance of regulation. It is possible for regulators to permit an efficient firm to grow while controlling the exercise of market power by limiting other aspects of the firm's conduct: for example, conduct that might raise a competitor's costs or preclude a competitor from expanding. Regulation of market power based on a portfolio of administrative and regulatory tools may also be able to better balance the need to control market power with the goal of enhancing efficiency as economic conditions change.

This is relevant to the determination of an appropriate level for the excessive-share cap. Conditions in the fisheries have changed over time and will change in the future. Thus, a share cap established at an appropriate level could over time become inefficiently high (offering too little constraint on the exercise of market power) or low (offering too much constraint on efficient competitive activity in the industry). This problem may be best addressed through periodic review of the excessive-share cap, with reviews being accelerated when changing economic conditions in the fisheries warrant.

³³ The precise effects will depend on the definition of contractual control of quota, the level of the cap, the contracting practices typical in the fisheries, and the administrative rules for associating quota with industry participants for purposes of assessing shares.

Alternatively, it may be possible to design an excessive-share rule that permits a high degree of quota ownership while preserving the incentive for quota holders to compete.

D. The Horizontal Merger Guidelines

The U.S. Department of Justice and the Federal Trade Commission (“Agencies”) have responsibility for investigating mergers in the United States and determining if a proposed merger would threaten competition should the merger be consummated. When the Agencies find that a merger would significantly weaken competition and create market power, they are able to file litigation opposing the merger. A court ultimately decides whether the merger may proceed or not.

Of course, firms that may seek to merge have an interest in knowing whether their merger is likely to be opposed by the U.S. Department of Justice or the Federal Trade Commission. The *Horizontal Merger Guidelines* is a means to that end. The *Horizontal Merger Guidelines* accomplishes two things. The *Horizontal Merger Guidelines* describes the methods used to define relevant markets for competitive analysis and calculation of market concentration thresholds. The *Guidelines* also describes the methods the Agencies use to evaluate the competitive impact of proposed mergers.

1. Relevant Market Definition

In competition analysis, the concept of the market used is the “relevant market.” A relevant market has two dimensions – a product dimension, which includes the product that is central to the analysis and its close substitutes, and a geographic dimension, which encompasses the locations of the sources of supply that buyers view as close substitutes.³⁴ The standard approach to defining the boundaries of the relevant product and geographic markets is the hypothetical monopolist test. This test identifies products and sources of supply that are reasonably interchangeable with one another.

The hypothetical monopolist test evaluates whether a profit-maximizing firm that is not subject to regulation and that is the only present and future seller of a group of products could profitably raise the price of those products by a small but significant non-transitory increase in price (a “SSNIP”).³⁵ To implement the test, a SSNIP is typically taken to be a five percent increase in price. To begin, one or more products are selected as the members of the candidate market.³⁶ If a hypothetical monopolist could profitably raise prices of *at least one* of the products by about five percent, this group of products is accepted as constituting a relevant product market.³⁷ If a hypothetical monopolist cannot profitably raise the price of the products by about five percent because customers would

³⁴ U.S. Department of Justice and the Federal Trade Commission, *Horizontal Merger Guidelines*, August 19, 2010 (hereinafter “*Horizontal Merger Guidelines*”), pp. 8-9 and p. 13.

³⁵ *Horizontal Merger Guidelines*, p. 9.

³⁶ In merger analysis the price increase is determined based on prices prior to the merger. For the analysis of competition more generally, it is appropriate to assess whether the price increase would be profitable relative to the competitive price level.

³⁷ *Horizontal Merger Guidelines*, p. 9.

shift their purchases to products outside of the candidate market, the candidate market is too small.³⁸ When a candidate market is found to be too small to serve as a relevant market, it is expanded by adding the next best substitute product into the candidate market and the test is performed again. A similar process is used to determine the boundaries of the relevant geographic market.³⁹

The relevant market is usually taken to be the smallest market (smallest set of products and geographic areas) that satisfies the hypothetical monopolist test.⁴⁰

One consideration when assessing the boundaries of a relevant market is the ability of suppliers to price discriminate (i.e., charge different customers different prices that are not related to cost). When a hypothetical monopolist is able to target a group of customers with specific prices, it is necessary to examine the competitive options facing those customers specifically. The reason certain customers may be targeted is that sellers may recognize that the customers have fewer competitive options, or less ability to shift their purchases away from some of the products in the candidate relevant market, than other consumers. Assessing the relevant market for customers that face a shorter list of competitive options is appropriate when there is the prospect that some customers will be subjected to differential treatment with adverse competitive consequences.⁴¹

2. Market Concentration Thresholds and Further Analysis of Competitive Effects

The standard measure of concentration used in competition analysis is the Herfindahl-Hirschman Index (“HHI”). The HHI is calculated by squaring the market share of each firm in the industry and adding up the squared market shares. Thus, a market with three firms with market shares of 50 percent, 30 percent, and 20 percent has an HHI of 3800 ($50^2 + 30^2 + 20^2 = 2500 + 900 + 400 = 3800$). The *Horizontal Merger Guidelines* classifies markets into three categories based on HHIs. Markets with an HHI below 1500 are considered unconcentrated; markets with an HHI between 1500 and 2500 are considered moderately concentrated; and markets with an HHI greater than 2500 are considered highly concentrated. It is important to note that these concentration calculations are intended to be applied *after* first determining the full set of relevant products constraining the prices of the merging firms, what the *Horizontal Merger Guidelines* calls the relevant market. With regard to merger enforcement, the Agencies

³⁸ The boundaries of the relevant market are determined by demand substitution or the willingness and ability of customers to switch their purchases to other products when the prices of the products in the candidate market rise.

³⁹ *Horizontal Merger Guidelines*, pp.13-14.

⁴⁰ *Horizontal Merger Guidelines*, p. 10.

⁴¹ If prices are individually negotiated with customers, the hypothetical monopolist test may indicate that relevant markets may be as small as a single customer. *Horizontal Merger Guidelines*, pp. 12-13.

are unlikely to oppose a merger that results in an unconcentrated market or where the change in HHI is small (e.g., less than 100).⁴²

There are many mergers that do not fall within the “safe harbor” concentration thresholds of the *Horizontal Merger Guidelines*, but remain unopposed by the Agencies because the transactions appear unlikely to create market power. When the safe harbor concentrations are exceeded, further analysis of other considerations is often necessary to determine whether a proposed merger will threaten competition and, if so, what remedies may be available. The *Horizontal Merger Guidelines* describes the additional methods the Agencies use to evaluate transactions that would exceed the safe harbor concentration thresholds.

A clear implication of the *Horizontal Merger Guidelines* is that context matters. Large market shares or high levels of concentration are sometimes acceptable and are at other times a threat to competition, depending on circumstances. Thus, applying only the safe harbor thresholds in the *Horizontal Merger Guidelines* to quota ownership would not be an appropriate method to determine the level of an excessive-share cap in the SCOQ fisheries. The *Horizontal Merger Guidelines* does, however, describe the appropriate economic methods to use to assess what size of share would likely allow a firm to exercise market power under a given set of economic circumstances. A combination of the safe-harbor concentration thresholds and the economic methods described elsewhere in the *Horizontal Merger Guidelines* underpins our analysis of the appropriate level for the excessive-share cap.

IV. The Structure of the Clam Harvesting and Processing Industry

The Surfclam and Ocean Quahog harvesting and processing industry has three segments:

- Quota owners or holders: the firms and individuals that own or control the quota rights to harvest clams;
- Harvesters: fishers and the capital (fishing vessels) they use;
- Processors: specialized firms that process harvested clams into shucked clam meat or other products for their customers.

To the extent harvesters or processors own quota or control it through contracts, an excessive-share rule may affect their ability to accumulate quota. Therefore, an excessive-share rule may affect competition and concentration in the harvesting and processing sectors, and the effect of the rule may enhance or diminish economic efficiency, depending, in part, on whether there is market power in the harvesting or processing sectors. However, a cap on the amount of quota any single entity can own or control will not directly limit the exercise of market power by harvesters or processors if that market power is based on factors other than quota ownership or control. The analysis here is targeted at the possibilities for the creation or exercise of market power

⁴² *Horizontal Merger Guidelines*, p. 19.

specifically through the ownership or contractual control of quota. We do not address the control of market power founded on industry characteristics other than quota holdings.

A. Quota

We will first discuss the concentration of current SCOQ quota holdings and usage. Throughout this section, we calculate HHI values and compare them to thresholds discussed in the *Horizontal Merger Guidelines*. Concentration measures provide a helpful index, but are pertinent to the analysis of market power only when based on shares in a relevant market containing all close substitutes of the products of interest. Thus, concentration measures of quota ownership do not necessarily provide evidence of market power, even if they are high, to the extent SCOQ clams compete with other clam products.

When the Surfclam and Ocean Quahog fisheries implemented the ITQ system, the initial allocations of quota were allocated to the vessel owners that had harvested Surfclams and Ocean Quahogs between 1970 and 1988.⁴³ This led to highly diffuse quota ownership.⁴⁴ Since that time, many of the initial quota owners have sold their quota and left the fisheries. Increased concentration of quota ownership is a natural consequence of the elimination of excessive fishing effort and underutilized capital from the fisheries.⁴⁵ Despite the exit of quota owners from the fisheries and the resulting increases in the concentration of ownership, the existing allocation of the quotas to harvest Surfclams and Ocean Quahogs remains unconcentrated.

A single entity or firm can own more than one individual quota allocation, and evaluating concentration requires determining who owns each quota allocation and the relationships among owners. In 2009, NMFS found there were 56 individual Surfclam quota allocations that were owned by 49 independent entities. The HHI of initial Surfclam quota ownership in 2009 was 1167. The concentration of Ocean Quahog quota ownership was similarly low. NMFS identified 45 individual Ocean Quahog quota allocations in 2009 that were owned by 37 independent entities. The HHI of the initial Ocean Quahog ownership in 2009 was 993.⁴⁶ Examination of the quota transfers in 2009 showed no permanent transfers that would have changed these HHIs for 2010.⁴⁷

⁴³ Sharing the Fish, p. 63.

⁴⁴ Social Sciences Branch of the Northeast Fisheries Science Center, "Excessive Share Issues in the Surfclam and Ocean Quahog Fishery: Report to the Surfclam and Ocean Quahog FMAT," August 12, 2009 (hereinafter "Excessive Share Issues"), p. 12.

⁴⁵ See, e.g., Stanley Wang, "The Surfclam ITQ Management: An Evaluation," *Marine Resources Journal*, Vol. 10, No. 1, 1995, pp 95-96.

⁴⁶ One of the goals of the ITQ system was to eliminate excessive fishing effort, and by that measure, the system has largely been a success (Excessive Share Issues, p. 12).

⁴⁷ Bank of America permanently transferred its full Ocean Quahog quota to Bumble Bee Foods. Bumble Bee Foods held no other quota. Therefore, this transfer has no effect on the HHI for Ocean Quahog quota ownership. See 2009 Ocean Quahog allocation and trading data.

The existing ownership of SCOQ quota remains unconcentrated and would not raise market power concerns even if the markets for SCOQ quota were not subject to meaningful competitive discipline from close substitutes or other factors. Based on the latest *Horizontal Merger Guidelines*, markets with HHIs below 1500 are considered to be unconcentrated.⁴⁸

Data reliably showing the ownership and control of quota following transfers in the SCOQ fisheries are not available. Information showing the parties to quota transfers does not show the ownership relationships among the final quota holders. The need for harvesters to hold quota at the time of harvesting raises further complications: some harvesters own or contract for their own quota, whereas in other cases processors obtain quota and transfer it without charge to their harvesters (which may be affiliated or independent). When the processor owns quota or contracts for quota on behalf of a harvester, the transfer data will show the quota has been transferred to a harvester, but will not show whether the processor retains control of the quota in such transactions (“control” in this context means the power to decide whether the quota will be used to harvest clams). A complete understanding of the actual ownership and control of quota requires analysis of the contracts under which quota were transferred to the final owner or holder. An additional problem arises from the reporting of quota when used. The owner of quota is supposed to report to NMFS the specific tags (quota) that are used throughout the season. However, in many instances, it is not the recorded owner but another entity that reports the quota used.⁴⁹ This is most likely a problem with related entities reporting the use of quota, which is another aspect of determining final quota ownership or control.

To circumvent these issues, NMFS calculated the shares of the reported harvest by the vessels in the fisheries and traced the ownership of the vessels.⁵⁰ This analysis of harvesting concentration provides the best available evidence on the concentration of quota ownership following transfers to processors and harvesters.⁵¹ However, this measure of concentration may misestimate the concentration of quota holdings by attributing quota to independent harvesters when the quota are, in fact, owned or controlled by a processor or other entity. The concentration of harvesting in the Surfclam and Ocean Quahog fisheries is described below.

Information on whether owners merged or there were changes in the control of firms that own quota is not available.

⁴⁸ *Horizontal Merger Guidelines*, p. 19.

⁴⁹ NMFS Data.

⁵⁰ Excessive Share Issues, pp. 12-13, and NMFS Data.

⁵¹ Processors may provide tags to independent harvesters with which they have contracted. In this case the processor is directing the use and receiving the benefits of the quota, but the harvested clams would be attributed to the independent harvester rather than to the processor.

B. Harvesting

The harvesting of Surfclams and Ocean Quahogs is substantially more concentrated than the initial ownership of quota in the fisheries. This higher concentration reflects the concentration of used quota after they have been transferred to harvesters. NMFS has compiled data showing the ownership of the vessels that reported harvesting Surfclams and Ocean Quahogs. According to these data, 32 vessels harvested Surfclams in 2008. The data also show that 14 firms owned these vessels. The same data show that 18 vessels, owned by nine firms, harvested Ocean Quahogs in 2008.⁵² A total of 17 firms harvested Surfclams and Ocean Quahogs in 2008.

Even though many firms harvest clams in the two fisheries, the measure of concentration is high because some firms harvest large shares. The HHI in 2008 was 4080 for Surfclam harvesting and 2653 for Ocean Quahog harvesting, and 2890 for combined harvesting of both species. These concentration measures are above the threshold established in the *Horizontal Merger Guidelines* for a market to be considered highly concentrated. Moreover, the concentration of harvesting in the fisheries has risen substantially over the last decade. In 1998, the HHI was 1561 for Surfclam harvesting, 1853 for Ocean Quahog harvesting, and 1016 for combined harvesting of both species.⁵³ By the standards of the *Horizontal Merger Guidelines*, the concentration of harvesting has increased from the moderately concentrated range (or the unconcentrated range for the combined harvest) in 1998 to the highly concentrated range in 2008.

Many processors are vertically integrated into vessel ownership and harvesting. In fact, processors have increasingly expanded their businesses “upstream” into the harvesting sector. Figure 6 shows the landings of Surfclams and Ocean Quahogs by processors. Between 1998 and 2008, processors never harvested less than 50 percent of the total Surfclam harvest. Since 2005, processors have harvested approximately 80 percent of the total Surfclam harvest. The processor share of the Ocean Quahog harvest grew from about 20 percent to 50 percent between 1998 and 2008. The increasing concentration of harvesting may be the result of vertical integration of the relatively concentrated processor segment into harvesting.

C. Processors

The processing segment of the clam industry has undergone significant consolidation over the last 30 years. In 1979, there were 44 plants that processed either Surfclams or Ocean Quahogs. The available data do not report the number of firms that operated these plants.⁵⁴ Today, eight firms process Surfclams and four firms process

⁵² Eight vessels harvested both Surfclams and Ocean Quahogs. Thus, 24 vessels exclusively harvested Surfclams and ten vessels exclusively harvested Ocean Quahogs. There were 42 total vessels active in the two fisheries.

⁵³ NMFS Data.

⁵⁴ Mid-Atlantic Fishery Management Council in cooperation with the National Marine Fisheries Service and the New England Fishery Management Council, “Amendment #3 to the Fishery

Ocean Quahogs. These processors operate a total of 12 plants.⁵⁵ There has been little change in the number of firms processing Surfclams over this period. The number of firms processing Ocean Quahogs, however, has fallen from seven to four.

NMFS data on processor purchases of Surfclams and Ocean Quahogs show that there was a modest amount of entry and exit in the processing sector between 2003 and 2008. For example, in 2006, the Truex Group and the management team of the largest processor, Sea Watch, acquired Eastern Shore Seafood.⁵⁶ Despite processor exit, processors report that they have excess capacity to process clams. These facts – the exit of processors from processing Ocean Quahogs while continuing to process Surfclams (noted in the previous paragraph) and the exit of processors from acquiring SCOQ harvests entirely – are not consistent with a finding that processors are exercising market power and earning above-competitive long-run profits.

Despite a relatively constant number of firms processing either Surfclams or Ocean Quahogs, the concentration of the processing sector grew substantially between 2003 and 2008 as relatively large firms exited or merged and the entering firms remained relatively small, allowing incumbent firms' shares to grow. The HHI of Surfclam purchases by processors grew from 2068 to 3134 between 2003 and 2008. Similarly, the HHI of Ocean Quahog purchases grew from 3437 to 4369 over the same period. Notably, concentration has fallen somewhat after peaking in the Surfclam and Ocean Quahog fisheries at 3675 and 4629, respectively, in 2007. The HHI of processor purchases for Surfclams and Ocean Quahogs combined has also grown, from 2226 in 2003 to 3479 in 2008.⁵⁷

The HHI of the Surfclam and Ocean Quahog processing sectors is in the highly concentrated range based on the thresholds in the *Horizontal Merger Guidelines*. We address only whether processors have market power that is based on their quota ownership; we do not address whether processors have market power arising from the high concentration or other characteristics of the processing sector. That participants in the highly concentrated processing sector are likely to be the large holders of quota is relevant to establishing the excessive-share cap at a level that precludes creation or increase of market power through quota holdings. As described elsewhere in this report, a processor holding a large amount of quota may be able to gain market power in the markets for specific clam products or limit competition by withholding quota from

Management Plan for the Surf Clam and Ocean Quahog Fisheries and Supplemental Environmental Impact Statement,” April 1981; see also Excessive Share Issues, p. 11.

⁵⁵ Mid-Atlantic Fishery Management Council in cooperation with the National Marine Fisheries Service, “Overview of the Surfclam and Ocean Quahog Fisheries and Quota Considerations for 2010,” May 2009 (hereinafter “Quota Considerations”), pp. 17-18.

⁵⁶ Quota Considerations, p. 5.

⁵⁷ NMFS Data.

competing processors. Today, however, no processor reports that it is unable to purchase or lease sufficient quota for its business needs.⁵⁸

V. Potential Market Power Concerns and the Competitive Constraints on the Exercise of Market Power in the Surfclam and Ocean Quahog Industry

We begin this section by describing the kinds of market power that quota holders (through either ownership or contractual control) might exercise. We then discuss the limits on the exercise of market power imposed by a number of existing competitive constraints in the SCOQ fisheries.

A. The Exercise of Quota-Based Market Power

The exercise of quota-based market power theoretically could occur at different levels of the SCOQ industry.⁵⁹ For example, the exercise of market power theoretically could occur in the market for the leasing and sale of quota. Processors and harvesters would then pay increased prices for quota, and the withholding of quota would reduce the output of the fishery. An increase in the prices of processed SCOQ clam products would occur if a reduction in the supply of SCOQ clam products could not be readily offset by increased production from state fisheries, by increased imports of substitute clam products, or by other substitutes. However, if these possible offsets were ample, the quota owners would be unlikely to be able to raise the price of quota unless the reduction in the demand for harvesting and processing services led to a reduction in the prices of those services, in which case quota owners could raise the price of quota without a material increase in the cost of SCOQ clam products. Harvesters and processors would suffer from the exercise of market power while consumers would largely be protected by their ability to substitute to other products.

Another theoretical alternative for the exercise of market power is that the harvesters or processors buy or lease the quota from the allocation owners under long-term contracts and accumulate sufficient quota to exercise market power during the term of the contracts. If the long-term contracts were to have fixed prices, it is the lessees that would benefit from any increased pricing during the term of the contracts. Thus, contractual holders of quota might have the incentive to withhold quota that they control through contracts. However, different types of ownership and control have different implications for the likelihood that a large quota holder could profitably exercise market power. For example, leases with market-driven flexible pricing pose less of a risk that the lessee would withhold quota in that it is the lessor that would capture much of the benefit of price increases (diluting any incentive for the lessee to withhold quota).⁶⁰

⁵⁸ Excessive Share Technical Meeting, October 22, 2010.

⁵⁹ As described above, the exercise of market power occurs when quota holders are able to withhold quota to reduce the output of the fisheries, raising the price of clams and/or clam products. This requires that the harvest fall not only below the competitive harvest level but also below the TAC.

⁶⁰ It is possible for a large quota holder to purchase quota on an annual basis or through a lease with annual price redeterminations and withhold some of that quota to drive up prices within a season. Profitably doing so, however, would require that the demand for clams and for quota be relatively

Harvesters holding or controlling large accumulations of quota could “withhold quota” from the market by restricting their harvesting of clams. To the extent that state fisheries could not expand their output, the result of reducing the clam harvest would be higher clam prices to processors. The processors would buy fewer clams and would lower their output of SCOQ products. As above, if the reduced output of SCOQ products could not be replaced by substitute clams or other substitutes, the price of SCOQ products customers pay will rise.

Processors holding or controlling large accumulations of quota (which may occur through the typical contracting practices in the SCOQ fisheries, through either quota held by processors themselves or quota held by harvesters that are affiliated with processors) theoretically might be the beneficiaries of increases in the price of SCOQ clam products, increases in the price of quota, or decreases in the price of harvested clams (which might be achieved through monopsony power).

High levels of concentration in the processing sector may mean that large quota accumulations do not lead to any *increase* in market power in the processing sector. Even if there were just one processor that had no long-term quota ownership or control, that processor could still determine how much output to produce and the amount of harvesting services to buy. Negative effects of market power (above-competitive prices for SCOQ products and below-competitive prices for quota and harvesting) could theoretically occur regardless of whether a monopoly processor controls any quota.

In the above example, the processor’s market power does depend on barriers to entry that prevent additional competition. Because quota is necessary to harvest Surfclams and Ocean Quahogs, processors holding large accumulations of quota could theoretically keep other processors from expanding or keep new processors from successfully entering the SCOQ processing industry by withholding unused quota. Thus, a key theoretical threat from large processor accumulations of quota is that they could be a means to foreclose competing processors. In fact, accumulation of SCOQ quota ownership could be used as a means to commit to the exclusion of other processors over a long enough period of time to drive other processors from the market.

As one final example of the exercise of market power, it is possible (in theory) for a large quota holder to abstain from harvesting in the beginning of the season, allowing other quota holders to use their quota. When other quota holders were out of quota, the large quota holder would be in the position of a quota monopolist at the end of the season. We do not address dynamic, intra-season quota accumulations in our analysis, in part because we assume that the regulator would not have the resources to continually monitor and enforce an excessive-share cap other than on a seasonal basis. In addition, however, consumer demand for a regular flow of clam products and the ability for other

inelastic. The evidence for the SCOQ fisheries is that the demand for clams and quota is quite elastic. Below we address the proper method of associating quota for purposes of assessing shares. The general rule is that the party that controls the use of the quota and would obtain the benefit of the price increase from withholding quota should be associated with the quota for share calculations.

quota holders to observe and adjust to the intra-season withholding could constrain the effectiveness of such a strategy.⁶¹

We now turn to a broader discussion of some of the factors that may constrain the ability of quota holders to exercise market power in the SCOQ fisheries.

B. Competitive Quota Ownership

As described above, the initial ownership structure of Surfclam and Ocean Quahog quota ownership is quite competitive. Moreover, there appears to be quota available from unconsolidated quota holders, even after temporary transfers of quota. For example, there are allocations of quota that are unused.⁶² This unconsolidated ownership or control of unused quota can be a check on the exercise of market power by quota holders, by providing a source of additional quota should large quota holders attempt to withhold quota.

C. The Relevant Market(s) for SCOQ Clams and Clam Products

The breadth of the relevant market makes a significant difference in the assessment of a reasonable level of an excessive-share cap. Consumer demand drives a definition of relevant markets that hinges on whether a hypothetical monopolist could profitably raise price. When demand is highly elastic and substitutes are amply available, small changes in price lead to large changes in the quantity demanded. The large reductions in output caused by price increases generally limit the potential for the significant exercise of market power (because moving the market price substantially requires withholding, without revenue, a large quantity). The demand for quota is ultimately derived from the demand for clam products. If demand for clam products is elastic, then demand for quota will be elastic as well. Thus, determining an excessive-share cap for the SCOQ ITQ requires a clear definition of relevant markets for products from the SCOQ fisheries.

We do not make a final assessment of the relevant markets for clams and clam products. Instead, we provide some direction that will help the Council determine whether or not the relevant market is limited to clams or includes other seafood products or if the relevant markets are smaller and should be defined to be particular clam products. These assessments should be able to be made based on the Council's

⁶¹ Similarly, we have not addressed other possible strategies that involve developing and exercising market power over time. For example, we do not evaluate whether it would be possible to import sufficient clams to drive down the value of quota for the purpose of accumulating quota at a low price. Such a strategy would not seem to be necessary given the current excess supply of quota, despite import levels that have been relatively constant during the last decade.

⁶² NMFS Data. This has occurred while quota owners are actively seeking to lease or sell their quota holdings. Excessive Share Technical Meeting, October 22, 2010, and personal communications with NMFS personnel.

experience with the SCOQ industry and interviews of purchasers of SCOQ clam products.⁶³

Surfclams and Ocean Quahogs are processed into a variety of different demanded products. Some parts of the Surfclam are desirable for fried seafood platters or strip products. Other parts of the Surfclam may be chopped up for use in chowder. Ocean Quahogs have a somewhat less desirable color and flavor and are processed for use in lower-quality chowder products.⁶⁴ SCOQ processors may sell fresh, frozen, or canned clam products (intermediate products) to companies that make final products, like seafood platters or chowder, or processors may make final products themselves.

It is possible that all of the differentiated products compete vigorously with one another and/or with imported clam products as discussed in the next section. In fact, many SCOQ processors assert that they face broad actual and potential competition for their processed clam products from imports. However, if there were particular clam products without good substitutes, they could possibly allow a hypothetical monopolist to profitably raise prices just for those products, which might imply a relevant market definition excluding imports or other substitutes. At least one processor has presented evidence that imported clams and other proteins are not important sources of competitive discipline on the domestic clam industry.⁶⁵

The following examples outline how an analysis of relevant markets could proceed:

Example 1: If it were the case that the foot of the Surfclam is valued for a particular use, buyers of the Surfclam foot might have more limited options to use other parts of the clam or other species of clam than buyers of other parts of the clam. This would suggest that the foot of the Surfclam should be evaluated to determine whether it belongs in its own relevant product market (could a hypothetical monopolist controlling 100 percent of the available supply of the Surfclam foot profitably increase the price above the competitive level?). If buyers of the foot could readily switch their purchases to products made from other parts of Surfclams, Ocean Quahog clam meat or to products made from imported clam meat, rendering any attempted price increase unprofitable, then the candidate relevant product market would have to be broader.

Example 2: If buyers like Campbell's and Progresso purchase large amounts of fresh or fresh-frozen clam meat of a certain type for their chowder products, it is appropriate to examine their ability to substitute to other products. If a hypothetical monopolist controlling all supply of the kind and grade of SCOQ clam meat Campbell's and Progresso purchase could profitably raise the price above the competitive level, then this type of clam meat would constitute its own relevant product market. If, however,

⁶³ See *Horizontal Merger Guidelines*, pp. 11-12, for a discussion of the kinds of information that are generally informative about the boundaries of relevant markets.

⁶⁴ Quota Considerations, p. 13.

⁶⁵ Letter from Michael LaVecchia, LaMonica Fine Foods, March 31, 2011.

buyers like Campbell's and Progresso would shift their purchases to a different kind or grade of SCOQ meat or to imported clam meat, rendering the attempted price increase unprofitable, then the relevant product market would have to be broader.

Example 3: Ocean Quahogs are processed into chopped clam meat, which is canned and sold for use in chowder. Perhaps it is the case that buyers of canned clam meat and Ocean Quahog meat for chowder could readily switch to imported clams and to certain parts of Surfclams were the price of Ocean Quahog meat to rise relative to the prices of alternatives. Then, a price increase of Ocean Quahog meat would not be profitable to a hypothetical monopolist. Therefore, the hypothetical monopolist test would indicate that the relevant market that includes Ocean Quahogs also includes imported clam products and certain portions of the Surfclam.

D. Potential Competing Sources of Supply and Substitute Products

If there were elastic sources of products that consumers would readily purchase rather than SCOQ clams (if there were an increase in the price of SCOQ clams or clam products), then the potential for profitably withholding quota would be greatly reduced.

There are a number of other sources of clams that compete with Surfclams and Ocean Quahogs harvested from the federally regulated fishery. In addition to the federally regulated fisheries, there are state-regulated Surfclam fisheries in New York and New Jersey. Figure 7 shows the landings of Surfclams from state fisheries relative to the landings from the federally regulated Surfclam fishery. Production from state-regulated Surfclam fisheries has declined over the last several years, largely as the result of reduced populations of clams.⁶⁶ In fact, no landings were reported in New Jersey in 2008 or 2009.⁶⁷ Nevertheless, the New York fishery has provided significant additional clams to the supply from the federally regulated Surfclam fishery. Moreover, as in the federally regulated fishery, the harvest has in some years fallen short of the available quota.⁶⁸

In addition to other sources of fresh, unprocessed Surfclams and Ocean Quahogs, there are substantial imports of clam meats into the United States. Figure 8 shows that in 2008, the federal Surfclam and Ocean Quahog fisheries produced approximately 83 million pounds of meats.⁶⁹ In the same year the United States imported approximately 33 million pounds of fresh or canned clam meats and exported over 13 million pounds of

⁶⁶ Quota Considerations, pp. 7-11.

⁶⁷ Quota Considerations, p. 9.

⁶⁸ There is also an Ocean Quahog fishery in Maine. It is a small-scale fishery relative to the federally regulated Ocean Quahog fishery. The fishers use smaller boats and target smaller Quahogs for sale in a fresh, half-shell market in Maine. Prices for Maine Ocean Quahogs are much higher than for clams from the federally regulated fishery. Ocean Quahogs from Maine have significantly different characteristics than those from the federal fishery. There is likely to be relatively little substitution between Maine Quahogs and Ocean Quahogs from the federal fishery. Quota Considerations, pp. 15-16.

⁶⁹ Assumes 17 pounds of meat per bushel of Surfclams and 10 pounds of meat per bushel of Ocean Quahogs.

fresh or processed clam meats. Thus, imports amounted to nearly 40 percent of the domestic production of the federally regulated clam fisheries and exports amounted to just under 16 percent of the production of the federally regulated clam fisheries.⁷⁰

Processors report that there can be limitations on the ability of their customers to substitute to imported clams. Specifically, processors report that imported clams can have a different taste and texture than domestic clams, but that the processors' food service company customers could use food-science technology to switch from domestic to foreign supplies if prices warranted. This description indicates that the potential for substitution may be present, but investigation would be required to demonstrate that it would occur in response to a relatively small but significant price increase for SCOQ clam products.

The significant amounts of clam products imported into the United States, the reported large number of sources of competition and potential competition from imported clams, and the fact that incremental sales of processed (shucked) clams are exported onto the world market indicate that the domestic clam processors face elastic demand for at least some significant portion of their products. Processors argue that these factors keep them from raising prices for fear of losing these customers' business over the longer term.⁷¹

E. Large Buyers

The processors that source clams from the federal SCOQ fisheries report that they sell a large proportion of their output to large food service companies. Campbell's and Progresso produce clam chowder and are reported to be the largest buyers of clam meat. In addition, the processors sell to other food service companies such as Sysco and others. The processors report that these large sophisticated buyers are able to exert significant pricing power because of their large purchases and because they have the capability to substitute imported clams for domestic clams in their products if prices warrant. The threat of entry created by the ability of major customers to use other sources of clams has the potential to limit any efforts by processors to raise prices above competitive levels, and processors report feeling the effects of this pressure from their large customers.⁷²

F. Vertical Integration of Processors into Harvesting

Processors' backward integration into harvesting over the last five to seven years has corresponded to an increase in concentration in harvesting. The backward integration

⁷⁰ Processors report that imported clams are available from a relatively large number of countries, including Canada, Thailand, Vietnam, China, and Chile. Excessive Share Technical Meeting, October 22, 2010, and processor responses to written questions.

⁷¹ It is possible that clam meat competes with other proteins in some uses. Data are not available to rigorously evaluate whether other proteins, such as chicken or shrimp, compete with clam meat sufficiently that the prices of these substitute proteins substantially constrain the price of clam meat. See Letter from Michael LaVecchia, LaMonica Fine Foods, March 31, 2011.

⁷² It is also relevant that downstream clam meat purchasers could, if they desired, acquire quota, which would help guarantee sufficient supply and prevent processors from raising prices.

into harvesting, however, may actually improve the economic performance of the fisheries and their harvesting and processing sectors. One theoretical concern that arises from the existence of a concentrated processing sector is that it would exercise monopsony power over harvesters.⁷³ To exercise monopsony power, processors would reduce their demand for harvesting services, lowering the market price of harvesting services and increasing profits to the processing sector. Of course, if a processor owns a harvester, that firm would not benefit by underutilizing its owned harvesting assets in order to depress the price of harvesting services.⁷⁴ The processor will be motivated to use its own harvesting capacity if the incremental value of the harvest to the processor exceeds the incremental cost of harvesting, without regard for the effect of the additional harvesting on the market price of harvesting services. As a result, vertically integrated processors will increase harvest levels over those non-vertically integrated processors would choose were they to have influence over the market price of harvesting services.

G. Excess Supply of Harvesting Capacity

Processors report that there is excess harvesting capacity in the Surfclam and Ocean Quahog fisheries. This excess capacity is the result of vessels that are available to harvest clams, but are not currently contracted to do so, and the ability of vessels actively harvesting in the fisheries to harvest additional clams.⁷⁵ Analysis of landings by vessel shows that most vessels landed fewer bushels of clams in 2008 than the maximum number of bushels that they harvested over the period 1998-2008.⁷⁶ This finding supports the processors' assertion that the vessels currently operating in the fisheries could expand output if demand warranted.⁷⁷ Harvesters with excess capacity will have strong incentives to use their vessels intensively in order to maximize the return on their primary capital asset. Moreover, the excess supply of harvesting capacity implies that harvesting services will be supplied quite elastically. A highly elastic supply of harvesting services indicates that withholding of quota in an effort to exercise monopsony market power against harvesters is unlikely to be profitable.

H. Conclusions Regarding the Presence of Market Power in the Fisheries

Given the constraints discussed above, it may not be surprising that the evidence we analyzed does not support a conclusion that market power is currently being exercised through the withholding of quota (or, apparently, through other means as well).

⁷³ As described below, the evidence does not support the conclusion that the processing sector has exercised market power in the Surfclam or Ocean Quahog fisheries.

⁷⁴ See, e.g., Perry, Martin K., "Vertical Integration: The Monopsony Case," *The American Economic Review*, Vol. 68, No. 4, September 1978, pp. 561-570.

⁷⁵ Excessive Share Technical Meeting, October 22, 2010.

⁷⁶ NMFS Data.

⁷⁷ Landings per unit effort, i.e., bushels harvested per hour of fishing, have fallen quite dramatically for Surfclams. This indicates that the current stock of vessels may not be able to harvest as many clams as it did in earlier years.

Figure 9 shows Surfclam quota, landings, and the percent of quota landed for the period 1979 through 2008. Since the implementation of the current ITQ-based regulatory regime in 1990, the Surfclam harvest has been at or near the full quota level. The last five years, however, have seen production somewhat below quota. Figure 10 shows Ocean Quahog quota, landings, and the percent of quota landed for the years 1979 through 2008. The story for Ocean Quahogs is quite different from that for Surfclams. Since 1990, years when the full quota were utilized are the exception rather than the rule. Moreover, Ocean Quahog landings have been on a downward trend since the early 1990s, with the exception of a temporary increase during 2001-2004, which includes years in which processors report high demand and high prices (despite tension with Figure 12).⁷⁸

Figure 10 indicates that the Ocean Quahog fishery is performing today in line with historical trends, particularly if prices are now lower than in the early part of the decade. The significant underutilization of quota is, in part, the result of the TAC being set at a relatively high level compared to historical norms. Figure 9 shows Surfclam landings have fallen below quota since 2004. However, this underproduction has been accompanied by a significant decrease in the efficiency of harvesting operations. Figure 11 shows the landings per unit effort, or bushels harvested per hour of fishing, for both Surfclams and Ocean Quahogs. Surfclam landings per unit effort fell by 50 percent between 2000 and 2008. Figure 12 shows the prices processors paid to harvesters for Surfclams and Ocean Quahogs.⁷⁹ Prices for both species were quite flat, but showed some increase in 2008 and 2009. A price increase during these years is not surprising because fuel costs rose rather dramatically in 2008, and processors report levying fuel surcharges on their customers for at least some period of time to cover increased harvesting costs. Most importantly, the price increases are not associated with years where harvests fell relatively more below quota (e.g., 2005).

An important piece of evidence that supports the conclusion that quota is not being withheld from the market is the reports by processors that once it is apparent quota will be in excess supply in a season, the price of quota is quite low.⁸⁰ As described above, if quota were being withheld from the market to exercise market power, its price would be high because withholding would make quota scarce. This appears not to be the case currently as there are reports that quota owners are not able to lease their quota to harvesters or processors. Another piece of evidence is the low concentration of quota ownership before contractual transfers to processors and harvesters. These low levels of concentration are inconsistent with the exercise of any meaningful market power through the withholding of quota. However, the concentration of quota ownership and control following transfers, some of which are under long-term contracts with fixed prices, appears to be much higher than the initial concentration of quota holdings. The presence

⁷⁸ Excessive Share Technical Meeting, October 22, 2010.

⁷⁹ These prices include transactions between processors and their affiliated harvesters. Therefore, there is some question as to whether these fully reflect arm's-length prices.

⁸⁰ Prices are low early enough in the season that additional clams could be harvested if there were sufficient demand.

of these long-term contracts for quota may present a potential difficulty with respect to assessing market power.

VI. Excessive-Share Proposal

An excessive-share rule can be an effective instrument for limiting the exercise of market power through the withholding of quota. It is unlikely to be an effective rule, however, for completely preventing the creation or exercise of market power in the harvesting or processing sectors of the Surfclam and Ocean Quahog industry (through means other than withholding quota) or preventing the exercise of any market power that already exists. Given that the fishery remains under the jurisdiction of U.S. antitrust law in general, there will continue to be safeguards in place (other than the excessive-share cap) to protect against any general exercise of market power through such means as collusion on prices and output, or concerted foreclosure strategies.

As discussed in general terms above, establishing an overly restrictive regulation may not serve to increase economic efficiency. Setting a share cap that is too low could harm the economic efficiency of the fishery itself and of the processing sector. As described above, an excessive-share rule that strictly defines ownership or control of quota could limit the share of the Surfclam and/or Ocean Quahog catch a processor could purchase, which may prevent the firm from realizing efficiency-enhancing economies of scale. The excessive-share proposal described below reflects these concerns, while still providing constraints on the exercise of market power through the ownership and control of quota.

The proposal is laid out in a series of steps. For each step, we discuss the general principles that would apply to many fisheries, and then we explain the result of applying those principles to the SCOQ fisheries. At the end we introduce one additional idea for further analysis beyond the scope of the current report.

A. Step 1: Assess Availability of Requisite Information on Quota Ownership and Control

In order to apply principles like those found in the *Horizontal Merger Guidelines* and to reach informed conclusions regarding the acceptable degree of concentration of quota holdings, the regulator **must** be able to accurately calculate existing levels of concentration. The regulator must be able to define clearly what constitutes relevant ownership and control of ITQ shares, and be able to identify the quota owners and their affiliations that create aligning interests.

The guiding principle in determining the relevant “owner” of quota for the purpose of implementing an excessive-share cap is to identify who can make binding decisions about the use of the quota and who bears the risk of (or stands to benefit from) quota price changes. It is this entity that possibly has the ability and incentive to withhold quota anticompetitively and should be associated with the quota for purposes of the excessive-share rule. In the SCOQ fisheries, the regulator will need to obtain information showing who the contractual holders of quota are, and may have to require quota holders to report their affiliations to the regulator. Once an excessive-share rule has been implemented, the need for baseline information will be reduced and quota

holders may be able to report their holdings and changes in affiliation only when their holdings exceed some reasonable threshold.

As described below, the excessive-share cap is a cap on the amount of quota that any group of affiliated quota holders to which the excessive-share rule applies can accumulate, or use, during the course of a season. If that group of affiliated quota holders acquires additional quota during a season, then its total quota holdings must be tallied to ensure that they remain under the cap for the season.

Application of Step 1 for SCOQ Fisheries:

In the SCOQ fisheries, affiliations among quota holders may be based on either family ties or commercial interests. The Council must determine which entities are affiliated and then accurately assess quota holdings and transactions in order for any excessive-share cap to be meaningful.

Once the Council determines which entities buy and sell quota, it is necessary to assign holdings to each entity.⁸¹ This should be done prior to the beginning of a season. In some cases, associating quota with those controlling it prior to the season will be straightforward. For example, a quota allocation owner that has not contracted to lease out its quota for the upcoming season would be assigned the quota that it owns. Quota that has been leased under a long-term fixed-price contract would be assigned to the entity that leased the quota from the owner.⁸² In this case, it is the party that contracted for the quota (the lessee) that may have the incentive to withhold quota to raise its price. If, however, a long-term contract has prices that are set to market levels, it is the owner of the quota that retains the risk that the quota's value will change. For transfers lasting only one season, the quota should be assigned to the acquiring party if the transfer has occurred by the time of the preseason audit of quota holdings. Transfers occurring during a season must also be reported and tracked.

Similar rules should apply to contracts between processors and harvesters that involve quota. To the extent a harvester is obligated to use quota on behalf of the processor (and will not reap the benefits of price changes), the quota should be assigned to the processor. For example, if a processor offers a harvester (that owns the quota) a fixed price for clams and the harvester is obligated to reserve the quota necessary to supply these clams, the processor would be assigned the quota (the processor controls the use of the quota and would benefit from an increase in the value of clams and quota).

If, however, the supply agreement does not obligate the harvester to reserve the quota for the processor, or has the harvester bearing the risk of price changes, then the

⁸¹ No quota should be double-counted as applying to more than one party's shares (although holdings can be split: for example, associating 50 percent to each half of a joint venture between two parties with equal votes). In other words, the sum of the shares associated with all parties for the purpose of evaluating the cap should equal 100 percent of the TAC.

⁸² "Fixed-price" means the price of the quota (per bushel of harvest allowed) is set for the duration of the contract (it need not be the same price throughout the term of the contract, but the level at any point during the term is predetermined at the onset of the contract).

quota should be assigned to the harvester. This is because it is the harvester rather than the processor that benefits from an increase in the price of quota. Therefore it is only the harvester that could possibly have the incentive from this quota to contribute to price elevation. For example, if a processor contracts with a harvester (that owns quota) for 15 bushels at market price per bushel (perhaps by matching best price offered by any processor at time of delivery), then the harvester would be assigned the quota.⁸³

B. Step 2: Assess Availability of Requisite Competitive Information

There is a certain amount of information on competition that must be available to regulators for any meaningful determination and implementation of an excessive-share cap.

A regulator relying on the framework provided in the *Horizontal Merger Guidelines* must have sufficient information to evaluate the state of competition in the marketplace in a manner consistent with the *Guidelines*. As described earlier in this report, the *Horizontal Merger Guidelines* specifies thresholds for moderately concentrated and highly concentrated markets. In some markets, high concentration does not stand in the way of vigorous competition, while in others high concentration threatens the exercise of market power. The *Horizontal Merger Guidelines* also describes a number of economic conditions that influence whether markets are likely to operate competitively and whether a proposed transaction is likely to provide the capability and incentive to exercise market power under different market conditions. Under some industry conditions, a transaction resulting in moderate concentration could be deemed problematic, while under other conditions, a transaction resulting in high concentration may still be acceptable.

The relevant information the regulator must collect includes the scope, quantity, and flexibility of supply of substitute products, the level of excess capacity in harvesting and processing, the degree of product heterogeneity, the relative bargaining power of buyers and sellers, the ability to price discriminate, ease of entry, and efficiencies (or economies of scale). This information would be required for ITQ transactions as well as related industry activities including fishing (harvesting) and processing. Information on product substitution should have sufficient detail for the determination of relevant markets, as described in the *Horizontal Merger Guidelines*. The product of this inquiry will be an informed, fact-based judgment regarding the highest degree of concentration that would be consistent with a well-functioning, competitive market.⁸⁴

⁸³ We note that such contractual arrangements may not currently be present in the SCOQ fisheries.

⁸⁴ This exercise applies the principles of the *Horizontal Merger Guidelines* in a manner that is different from the typical application. When determining whether to intervene to prevent a merger, the U.S. Department of Justice and the Federal Trade Commission use the *Horizontal Merger Guidelines* to determine if the merger threatens competition, based on the characteristics of the markets where the merging firms overlap. Here, the principles underlying that type of determination are being used to assess the maximum level of competition that is consistent with a competitive market for quota, based on the characteristics of the market in which that quota is used.

Application of Step 2 for SCOQ Fisheries:

A key issue for assessing competition in the Surfclam and Ocean Quahog fisheries is the degree of competition the fisheries experience from competing clam products (and possibly other products). Industry participants note that there are several uses for which either Surfclams or Ocean Quahogs are acceptable, but there are also at least some uses for which only Surfclams may be acceptable. Similarly, some processors report that there are some uses where imported clams compete with SCOQ clams.⁸⁵ The question is whether the degree of substitution among imported and domestic clam meat is sufficiently high to place them in a single relevant market.⁸⁶ It is not necessary that two products be perfect substitutes in order to be in the same relevant market. What is necessary is that a hypothetical monopolist controlling all of one product could not profitably raise the price for that product because the monopolist would lose sales as the result of buyers' switching to other products in at least some uses, though not necessarily all uses.

Detailed data on quantities and prices would allow for a quantitative analysis to determine whether product substitution rises to the level necessary to include all products relating to Surfclams, Ocean Quahogs, and imported clam meat in the same relevant market, or various combinations into smaller relevant markets. These data, however, are not available to us. Therefore, the Council must assess whether there is sufficient information to define relevant markets and how to remedy any information insufficiency, and after appropriate analysis, determine the relevant markets.

Specifically, the questions that remain unanswered by our analysis are: 1) Would a hypothetical owner of the entire Surfclam harvest (or all processed Surfclam meat) be able to raise price profitably above the competitive level to some or to all buyers, or would there be sufficient substitution to Ocean Quahogs to constrain such a price increase? 2) Would a hypothetical owner of the entire Ocean Quahog harvest (or all processed Ocean Quahog meat) be able to raise price profitably above the competitive level to some or to all buyers, or would there be sufficient substitution to Surfclams to constrain such a price increase? If the answer to both of these questions is that a single owner could not profitably raise the price of Surfclams or Quahogs, then the relevant market may include the combination of Surfclams and Ocean Quahogs in the federally regulated fishery. Next: 3) Would a hypothetical owner of the entire SCOQ harvest (or all processed SCOQ meat) be able to raise price profitably above the competitive level to some or to all buyers, or would there be sufficient substitution to imports (and/or harvests from state-regulated fisheries) to constrain such a price increase? If increased imports of

⁸⁵ Excessive Share Technical Meeting, October 22, 2010, and processor responses to written questions. One processor has provided information indicating that imported clam meat may not be a meaningful source of competition to domestic clam meat. Letter from Michael LaVecchia, LaMonica Fine Foods, March 31, 2011.

⁸⁶ It may be the case that imported clam meat competes with some processed clam products. For example, imported canned clam meat may compete with domestic canned clam meat, but imported clam meat may not compete materially with fresh or frozen domestic clam meat.

clam meat would constrain the pricing of SCOQ clam meat to the competitive level, then the relevant market includes imports (and harvests from state-regulated fisheries).

Other information about competitive constraints also appears to be generally favorable to the hypothesis that large share accumulations may not confer market power, but again we do not have sufficient detail for rigorous quantitative analysis. For example, industry participants report that downstream buyers are large and have considerable buying power, and that demands for clam meat and clam products are highly elastic. We do not have data to confirm these reports. Given the apparent unanimity of agreement among the industry reports, however, we proceed on the assumption that there is a high degree of buyer power and that the processors face relatively elastic demand for their processed clam products.

A relevant efficiency consideration related to an excessive-share cap is whether inhibiting firm growth increases costs (by suppressing economies of scale). Restrictions on quota holdings may limit the size of processors or harvesters. Whether this is economically costly depends on whether there are economies of scale in processing.⁸⁷ We proceed on the assumption that there may be scale efficiencies in processing within the range of excessive-share caps that we consider, but not in harvesting.⁸⁸

C. Step 3: Establish Whether the Threshold Condition Requiring No Cap Applies

This step addresses a threshold condition for determining whether any excessive-share cap is required. As discussed earlier in the report, a TAC that binds the quantity of harvest below a certain level serves to eliminate the possibility of raising prices by withholding supply. A TAC sufficiently restrictive to remove any incentive to withhold quota would obviate the need for an excessive-share cap.

The relevant “sufficiently restrictive” level is the quantity that would be produced if there were only a single entity producing in the industry – the “monopoly” output. If the TAC is set below the monopoly output, the market power of quota holders is irrelevant because there would be an incentive to produce at the TAC regardless of quota concentration.

⁸⁷ We do not have access to cost information that permits us to evaluate the degree to which processors may or may not have unexploited returns to scale. The exhaustion of returns to scale depends the capacity of efficiently sized equipment used by the processors and the degree to which the processing equipment is potentially useful for processing seafood products other than clams.

⁸⁸ In other words, a processor may be able to reduce the average incremental cost of processing by securing ownership or control of additional quota in excess of the lowest range of the share caps discussed in our analysis. For harvesting, however, we proceed on the assumption that there are no scale economies available within the range of share caps discussed in our analysis – in other words, if a single harvester were to harvest an amount equal to the lowest range of the share caps we discuss, then the harvester would be experiencing constant or increasing average costs with additional harvests.

Application of Step 3 for SCOQ Fisheries:

The TAC in each of the SCOQ fisheries currently does not restrict output in a market that appears to be operating competitively, so the TAC is not below the monopoly output. Therefore, the threshold for requiring no excessive-share cap has not been met.

D. Step 4: Establish Appropriate Concentration Thresholds

The next step is to use the information on competitive constraints to determine an appropriate concentration condition under the analytical framework of the *Horizontal Merger Guidelines*. In addition, the excessive-share cap should be set to guard against the possibility of the foreclosure of competitors by denying them access to quota.

The *Horizontal Merger Guidelines* offers little direct guidance relating to size limits for individual firms. Previous versions of the *Horizontal Merger Guidelines* have noted that a firm with a 35 percent market share could possibly have unilateral market power.⁸⁹ However, the current version offers no such guidance. The *Horizontal Merger Guidelines* does, however, provide extensive discussion of market concentration.

We propose that the regulator assess, as a threshold, the highest level of concentration of quota holdings (and number of industry participants) at which, and at lower levels too, the market is likely to be free of capabilities and incentives to exercise market power or engage in predatory conduct. Then, the regulator can mathematically determine the level of the excessive-share cap that just prevents that threshold level of concentration from being exceeded.

Application of Step 4 for SCOQ Fisheries:

As we have discussed above, downstream market conditions appear to provide substantial competitive constraints on SCOQ industry participants. Downstream demand for Surfclam and Ocean Quahog products appears to be relatively elastic. Large sophisticated buyers with numerous product development options appear to have considerable bargaining power with respect to clam processors. There is no indication that either of these conditions is likely to change in the foreseeable future. Under such conditions, the *Horizontal Merger Guidelines* suggests that a moderately concentrated market for clam products would not be a cause for concern. Thus, an appropriate SCOQ excessive-share cap would be set to prevent a relevant product market that includes Surfclam and/or Ocean Quahog products from becoming highly concentrated (HHI above 2500).

The proposed limit on concentration in the market for clam products (that are in the same relevant markets as Surfclams or Ocean Quahogs) can be directly related to the appropriate restrictions on quota holdings. As shown above in Figure 2, the theoretical withholding of quota would reduce the output of clams from the federally regulated fisheries, raising the prices of clams and clam products, and possibly reducing the price

⁸⁹ See, e.g., U.S. Department of Justice and the Federal Trade Commission, *Horizontal Merger Guidelines*, Revised April 8, 1997, p. 25.

of harvesting.⁹⁰ Then, quota owners would benefit from quota withholding because it would directly reduce the harvest of clams, raising the price of clams and clam products. Therefore, to assess this theoretical possibility, those who own or control quota can be treated as controlling a share of clam output that is equal to the amount of quota that they control, recognizing that the relevant share may be based on total clam output that is larger than the output of the federal fisheries – this is discussed in further detail in Step 5.

Additionally, processing is a stage of the industry where the potential for predatory conduct through quota accumulation could possibly exist because holding quota back from use could choke off input supply to competing processors. For such conduct to confer a long-run benefit on the holder of the unused quota, it would be necessary to reduce the set of effectively competing processors so that outside options are permanently restricted for harvesters and for downstream purchasers. It may be sufficient for at least two or three processor firms to be operating (given that large buyers can stimulate competitive bidding for supply agreements), although having additional smaller capacity beyond those two or three would provide an additional margin of protection. An excessive-share cap restricting long-term quota holdings to 40 percent or less of the harvest supply to processors would prevent unilateral quota accumulation from becoming a means to reduce processor participation to fewer than three firms.

The discussion above applies specifically to the SCOQ ITQ system, where processors specialize in the input from the SCOQ fishery. When the input to processors comes entirely from a regulated fishery with an ITQ system, then a given share of the quota corresponds to the same share of the input to processors. When processors receive input from multiple sources beyond the regulated fishery, however, then a given share of the quota will correspond to a smaller share of input to processors. It is possible that sources of supply from outside the regulated fishery alone could support three or more processors at an efficient scale, in which case no long-term quota holding restriction would be necessary to prevent foreclosure.

E. Step 5: Determine Relationship Between the Excessive-Share Cap and Market Concentration

The next step is to determine the relationship between possible excessive-share caps and the maximum possible level of relevant market concentration. This relies on market delineation and also on persistent structural features of the quota market, as explained below.

First, it is straightforward to find the maximum level of quota holding that is consistent with a given maximum possible level of concentration: assess concentration of substitute products (not regulated by the quota) within the same relevant market; assess the share of the market occupied by small (“fringe”) market participants; calculate the

⁹⁰ The available evidence suggests that harvesting services are supplied quite elastically and that there is little threat that quota holders could profitably exercise monopsony power to the detriment of harvesters. Moreover, processors are substantially vertically integrated into harvesting. Processors will employ their own harvesting capacity based on its incremental cost.

maximum number of independent quota allocations that can exist at the maximum holding size, include one additional quota holding that captures any remainder; and calculate the HHI for the resulting set of shares of these possible market participants.

For example, a maximum firm size of 25 percent of the market would allow for four firms at 25 percent each (no remainder) for an HHI of 2500. A maximum firm size of 30 percent would allow for three firms at 30 percent and one at 10 percent for an HHI of 2800. Additionally, the aggregate share held by quota holders with very small shares also bounds the maximum concentration possible at any given cap level. A firm with 1 percent share contributes only one point to the HHI. If 25 percent of the market is shared by a relatively large number of small firms (25 firms at 1 percent each, for example), then those firms contribute very little to the HHI in the aggregate even though they limit the scope of large holdings. Therefore, when there is a competitive fringe, the remaining quota holders can have relatively larger market shares for any given measure of concentration. If such a market had a maximum firm size of 35 percent, for example, then there could be just two large firms at 35 percent, one firm at 5 percent, and a “fringe” of 25 firms at 1 percent each. The resulting HHI would be 2500 (whereas the HHI associated with a 25 percent maximum firm size and no fringe would also be 2500).

The calculation of concentration can be done directly with ITQ shares only if the output of the fishery coincides with a *relevant* product market. If the relevant market is larger than the fishery, then a given share of quota holding would correspond to a smaller share of the relevant market.⁹¹ For example, if the fishery accounted for only one-half of the output of the relevant market, then a holding of 40 percent of the quota in the fishery would correspond to only 20 percent of the output in the relevant market.

Application of Step 5 for the SCOQ Fisheries:

We have made a number of calculations that determine the maximum excessive-share cap that is consistent with the relevant market having concentration no higher than the desired threshold. To apply these calculations first requires the determination of relevant markets, as discussed in Step 2. As already discussed, the withholding of quota might be beneficial to the quota holder because withholding quota limits the output of clams and raises the price of clams. The quota holder would capture the benefit of the increased price of clams. Therefore, it is appropriate to treat quota holders as controlling an amount of clam output equal to their quota holdings. We evaluate the quota holdings within the context of the larger market for clams and clam products for purposes of our calculations, while recognizing that we have not here delineated the relevant market with the confidence that more complete data could provide.

⁹¹ If the relevant product market is smaller than a fishery (if, for example, there are distinct geographic markets with separate supply and demand, and no cross-substitution), then an excessive-share cap applied to the whole fishery may be ineffective for controlling market power. We do not believe that the relevant products market(s) here are smaller than the individual species within the SCOQ fisheries.

Figure 13 illustrates how the maximum concentration of the overall market for clams varies with different levels of the excessive-share cap and with different aggregate levels of fringe holdings of quota and for different levels of competing non-SCOQ clams.⁹² The figures shown are shares of quota, which the regulator must identify to implement any excessive-share cap. Adjustments to the SCOQ quota shares are made in the calculation to account for additional output in the larger relevant market in the calculation of the HHI. The calculations assume that the individual fringe quota holdings and suppliers of substitute products in the relevant market are all individually very small and hence contribute nothing to the HHI, even as they may in aggregate represent a significant market share. If it were the case that there were large importers, the calculation could be readily adjusted to reflect the actual sizes of the importers providing competing products.

The top panel of Figure 13 shows the levels of concentration for combinations of excessive-share cap and aggregate fringe quota holdings for Scenario 1, in which we assume the relevant market includes both Surfclams and Ocean Quahogs from the SCOQ harvests, but nothing else.⁹³ Therefore, for purposes of this discussion, the share caps and ownership shares are for the combined fisheries. In the table, HHIs less than 1500 are shaded light blue and HHIs greater than 2500 are shaded yellow. The table shows that at low levels of aggregate fringe holdings, the highest excessive-share cap consistent with a moderately competitive market is 25 percent. However, if the aggregate fringe holdings grow, the share cap could rise to 30 percent or 35 percent and still meet the recommended threshold. An excessive-share cap of 30 percent to 35 percent would guarantee that three to four fishery participants held quota, which would limit the potential for predation or foreclosure effected by withholding quota from competitors.

The second panel of Figure 13 shows the results for Scenario 2, which assumes that there are non-SCOQ clams (i.e., imported clams and clams from state fisheries) that are good substitutes for SCOQ clams and the quantity of these competing clams is equal to 10 percent of the SCOQ harvest.⁹⁴ The table shows that for even low aggregate quota holdings by the fringe, the excessive-share cap can be as high as 35 percent while maintaining a moderately concentrated market for all clams that compete with SCOQ clams. This implies at least three firms holding quota, which may provide some constraint against predation or foreclosure of competitors.

Scenario 3 shows the results under the assumption that non-SCOQ clams are available in amounts equal to 20 percent of the amount of the SCOQ TAC. In this

⁹² We do not have sufficient price and quantity information to determine whether imported clams compete with domestic clams in some or all applications. Here we limit our analysis to competition from other clams and do not consider whether clams are highly substitutable with other proteins. Non-SCOQ clams are competing Surfclams and Ocean Quahogs that are not harvested from the federal SCOQ fisheries.

⁹³ This scenario does not account for competition from state fisheries as well.

⁹⁴ In this calculation, “imports” reflects the supply of clams from outside the SCOQ fisheries that compete with SCOQ clams. These could include domestic clams from state fisheries.

scenario, a 40 percent excessive-share cap is appropriate for a wide range of competitive-fringe levels.

Scenario 4, illustrated in the fourth panel of Figure 13, shows the results if the level of imported clams that compete with clams from the SCOQ fisheries rises to 40 percent of the SCOQ harvest. In this case, the excessive-share cap can rise to 60 percent even if the aggregate fringe holding of SCOQ quota is as small as 5 percent.⁹⁵ With such a high share cap, however, two firms could control all of the holdings. An excessive-share rule that permits two firms to hold the entire quota fails to meet the desired safe target for preventing predation (i.e., foreclosure of entry or expansion by processors).

The analysis above raises the question of how to apply the results found in Figure 13. The answer depends on the degree of substitution among different clam products. For example, if it were the case that neither Ocean Quahogs nor any imported clams competed with Surfclams, it would be appropriate to apply the results of Scenario 1 to the Surfclam fishery. Similarly, if Surfclams and Ocean Quahogs are good substitutes in all uses for one another, but no imports are good substitutes for the domestic clams, then it would be appropriate to apply the results of Scenario 1 to the Surfclam and Ocean Quahog fisheries on a combined basis. If imports compete with domestic clams, then it would be appropriate to apply the results from Scenario 2 or Scenario 3 (or a scenario with an appropriate level of imports) to the domestic fisheries on a separate or combined basis, depending on the level of substitution between them.

F. Step 6: Identify Regulatory and Practical Constraints

The next step is to identify the regulatory and practical constraints on the regulator charged to implement the proposed cap. As can be seen in the examples from Step 5, the excessive-share cap necessary to limit concentration to the desired level depends on the level of sales of products (imports) that are close substitutes for clams from the federal fisheries. Of course, the level of sales of competing products and other market conditions may change over time. Therefore, an excessive-share cap on quota holdings that is appropriate under one set of market conditions may be too high or too low under different circumstances. The best way to address this variety of possibilities is dependent on the legal foundation for the regulation and the practical capabilities of the regulator.

If the legal foundation mandates that the excessive-share cap must protect the fisheries against market power under any conceivable market conditions, then it is relatively easy to identify a cap by examining the relationship between the excessive-share cap and concentration under the least-competitive conceivable market conditions. If the legal foundation requires a balance between regulating market power and allowing for efficient industry operation, then a more measured approach is necessary.

Likewise, legal and practical considerations may provide implementation options for the regulator. One such option discussed in detail for this fishery is to set a relatively

⁹⁵ Higher levels of fringe holdings are consistent with still higher excessive-share caps. Of course, the possible extent of the competitive fringe is limited by the size of the large market participants.

restrictive cap for long-term holdings, but to allow a higher excessive-share cap by allowing short-term quota accumulation at a higher level. The excessive-share cap would be adjusted from season to season to reflect changing market conditions (although the cap on long-term holdings would be fixed). This approach allows for more flexible capacity developments by industry participants without allowing any participants to obtain permanent accumulations that could be used to exclude competitors.

Application of Step 6 for SCOQ Fisheries:

We consider two options for implementation, to allow for different interpretations of the mandate for an excessive-share cap.

The first option is to establish a fixed excessive-share cap that strikes a moderate balance between protecting against market power and allowing for efficiencies of scale by selecting the highest possible cap that appears sufficient to prevent a highly concentrated relevant product market for most of the range of foreseeable market conditions. This requires some balancing of efficiencies by the regulator, but provides the market with a clear and certain rule under which to operate going forward. The downside of this option is that there may be seasons when the excessive-share cap is overly restrictive (harming productive efficiency) or overly permissive (allowing market power), depending on changing conditions in the fishery.

The second option is to establish a more stringent cap for long-term holdings (to prevent exclusionary conduct), but allow for larger accumulations in the short term so as not to constrain efficient scale and to allow for adjustments to the excessive-share cap from year to year as market conditions change (the sum of a quota holder's long-term holdings and short-term accumulations would be subject to the overall excessive-share cap). We call this a "two-part cap." The preference for short-term accumulations in the two-part cap limits the share of long-term quota controlled by any single party, which limits the ability to foreclose competitors by withholding quota on a committed multi-season basis.⁹⁶

To the extent Surfclams and Ocean Quahogs are in the same relevant market, it is appropriate to calculate a single excessive-share cap and to apply that common cap independently to both species together in the fisheries. However, applying the same share cap to each species separately would achieve the same or greater level of protection against market power with possibly little or no additional threat of efficiency loss.

Alternatively, it may be the case that a quota holder of the entire Surfclam quota might be able to profitably withhold supply or price discriminate against some buyers if there are some applications where Ocean Quahogs or imports are not a good substitute

⁹⁶ We note that throughout this discussion we refrain from assessing prospects for exercising market power through the timing of quota holding or use within a given season. For the SCOQ market, there appears to be sufficient ability to shift supply throughout the season that such intra-season conduct would not be effective. That may not be the case for other fisheries, in which case the implementation of the excessive-share cap may have to incorporate an assessment of the ownership shares of remaining unused quota during the course of a season.

for Surfclams. If the Council determines that Surfclams and Ocean Quahogs are not in the same relevant market, then the calculations illustrated in Figure 13 can be readily adapted to each individual fishery, incorporating a separate assessment of the fringe and the level of competing products from outside of each of the federally regulated fisheries.

G. Step 7: Set the Excessive-Share Cap

The final step is to identify the excessive-share cap based on the considerations above.

We understand that the excessive-share cap is not intended to force the divestiture of quota. Therefore, to the extent that any industry participant already owns or controls a share in excess of what is determined to be the appropriate excessive-share cap, we recommend that existing shares in excess of the cap be exempted from the rule but not allowed to grow further.⁹⁷

Application of Step 7 for SCOQ Fisheries:

The correct application of the principles above requires proper determination of the relevant markets in which Surfclams and Ocean Quahogs are sold and the degree to which non-SCOQ clams and processed clam products compete with SCOQ products. Based on some processors' large contractual holdings of quota, the primary competitive risk in the SCOQ fisheries appears to be that processors will use control of large accumulations of quota to exercise market power. The uncertainty regarding the appropriate relevant markets for SCOQ clams and clam products means that our recommendations are conditional on the regulator's ultimate findings regarding the relevant markets.

Our recommendations flow from Figure 13. If there are SCOQ products that do not face meaningful competition from outside of the federal fisheries, the excessive-share threshold would have to be relatively lower than if there were competing products. For example, if there are Surfclam products that do not face competition from imported clams, processors with large accumulations of Surfclam quota would be able to limit their output of Surfclam products, and by refusing to sell their unused quota avoid entry or expansion by other processors. A potential check on this exercise of market power would be available from competing processors' ability to obtain Surfclams from state fisheries. As shown above, the harvest from New Jersey's and New York's state fisheries has been declining. If it is anticipated that the output of the New York state Surfclam fishery will be at about 10 percent of the level of the federal Surfclam fishery, the second panel of Figure 13 indicates that an excessive-share cap of 30 percent to 35 percent would be appropriate to restrain the market for Surfclam products from becoming highly concentrated, assuming a relatively low level of fringe quota ownership. If the harvest from state fisheries is expected to be higher over time, a higher excessive-share cap could

⁹⁷ If some of the holdings that exceed the excessive-share cap are term-limited contractual holdings, the Council should consider whether the contracts that lead to the excessive-share cap's being exceeded should be permitted to be renewed upon their expiration.

be implemented. A similar approach should be used to determine an appropriate excessive-share cap for Ocean Quahogs.

If SCOQ products face higher levels of competition from non-SCOQ clams and/or products, Figure 13 illustrates that higher excessive-share caps could be implemented. However, for the option of a single fixed cap, we recommend an excessive-share cap that does not exceed 40 percent for each of the Surfclam and Ocean Quahog fisheries. As shown in Figure 13 (for Scenario 3), an excessive-share cap of 40 percent would be appropriate whenever imports and state-regulated harvests exceed 20 percent of the relevant Surfclam and/or Ocean Quahog harvest and the aggregate share held by the fringe holders is small. Further, a 40 percent excessive-share cap would provide a modest level of protection against the risk that processors could foreclose entry or expansion by withholding unused quota from the market. An excessive-share cap of 40 percent assures that there would be at least three processors operating at reasonable output levels. As noted earlier, if it were the case that processors received input supply from multiple sources beyond the regulated fishery, then risk of foreclosure may be minimal or non-existent regardless of quota share ownership, in which case it may be appropriate for any restrictions on quota ownership to be guided entirely by Table 13.

For the option of a two-part cap, we recommend that long-term holdings be capped at 30 percent, and that the total excessive-share cap (i.e., long-term holdings plus short-term holdings) be selected and announced before the start of each season to meet the threshold concentration level (HHI no more than 2500) based on the relevant market determination and the size of the fringe.

For example, if the SCOQ fisheries are determined to be in a single relevant market with competition supplying an additional 40 percent of quantity from imports and harvests from state-regulated fisheries (as in Scenario 4), then the total excessive-share cap (long-term cap plus short-term cap) would 60 percent of the SCOQ TAC for the season (inclusive of the 30 percent cap on long-term holdings). A quota holder with long-term quota holdings of 20 percent would be able to buy additional quota representing 40 percent of the TAC on a seasonal basis ($60 - 20 = 40$).

If non-SCOQ clam products that are substitutes for the SCOQ harvest constitute only 20 percent of the SCOQ TAC, then the total excessive-share cap would be 40 percent of the SCOQ TAC for the season (in this case the cap on long-term holdings would still be 30 percent). The sum of the quota holder's long-term holdings and short-term accumulations would have to fall below the overall cap in any season.

The 30 percent cap on long-term accumulations prevents parties from obtaining quota share high enough to preclude competitors to a point where the total number of competitors would be fewer than four within the SCOQ fisheries. A party seeking to foreclose the entry or expansion of processors, for example, would be forced to compete each season with those potentially foreclosed processors for quota beyond the initial 30 percent cap. Although such a strategy might be successful in any given season, it is less likely to be successful for the multiple seasons it could take to drive competition from the market, and the commitment strategic value of the long-term holdings would be limited to just 30 percent.

The potential benefit of designing the excessive-share cap in this fashion depends largely on the importance of long-term contracting for efficient capital investment in vessels and processing. Suppose, for example, that securing supply for more than 30 percent of quota through long-term contracts is a necessary prerequisite to efficient investment in processing (perhaps scale benefits are significant at 40, 50, or 60 percent of the TAC, but capital investment is too risky without a solid source of supply lasting several years). In such a case, the ability to secure quota for more than 30 percent of the TAC only through seasonal contracts for bushel tags may inhibit efficient investment. In this case, however, the efficient equilibrium for processing would involve only one or two very large processors, and there could be concern that there may not be sufficient competitive pressure to ensure that such a small number of processors would pass on to customers the cost benefits of efficient production scale through lower prices. This would be a situation for which an excessive-share cap is an insufficient instrument for controlling market power and ensuring an efficient outcome.

H. Issues for Additional Consideration: Open Auction(s) for ITQ Sponsored by the Regulators

As discussed above, our recommendations depend on conclusions and assumptions that are in some instances guided by a limited body of information provided by industry participants. One important example of this is the assumption that the TAC is currently above the competitive output level because industry participants report that there is quota readily available in the market and that the price for quota is very low when all supply needs have been met during the season.

Additional information based on independent objective evidence could be useful for optimal administration of the fisheries. . For example, information on the value of quota expressed in short-term (“spot”) ITQ transaction prices in an efficient, liquid market would be an excellent source of objective evidence that would aid in managing the fisheries. In the current circumstances, such evidence could validate claims that quota has very low value and is not being withheld from the market despite harvests below TAC.

It also happens to be the case that spot ITQ transaction prices could be beneficial to industry participants in general, and to small quota holders in particular, that likely have less information on the value of quota than larger holders engaged in multiple quota transactions. Thus, large quota holders with access to more information have the potential to use that information at the expense of smaller quota holders and possibly take advantage of asymmetric information in some ITQ transactions. For industry participants in general, a valid price signal for ITQ during a season provides important information that could guide vessel owners and processors in the allocation of their labor and capital resources effectively – helping them allocate resources to the more profitable fishery, for example.

One way to provide the accurate price signal to the market and to the regulators is for the regulators to sponsor an open auction during each season for a modest portion of the TAC from each fishery. We understand that there exist provisions in the regulations for the NMFS to use some quota to encourage free entry into the fisheries. Reserving a

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small portion of that quota to sell at open auction would serve exactly that purpose, and would provide yet another check on the exercise of market power through the possible withholding of quota. Details for the design and implementation of such an auction would require additional economic analysis not covered in the scope of this report.⁹⁸

⁹⁸ See U.S. Department of Commerce, *The Design and Use of Limited Access Privilege Programs*, Lee G. Anderson and Mark C. Holliday, eds., NOAA TM NMFS-F/SPO-86, pp. 124-135.

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Figure 1
Competitive Market Equilibrium

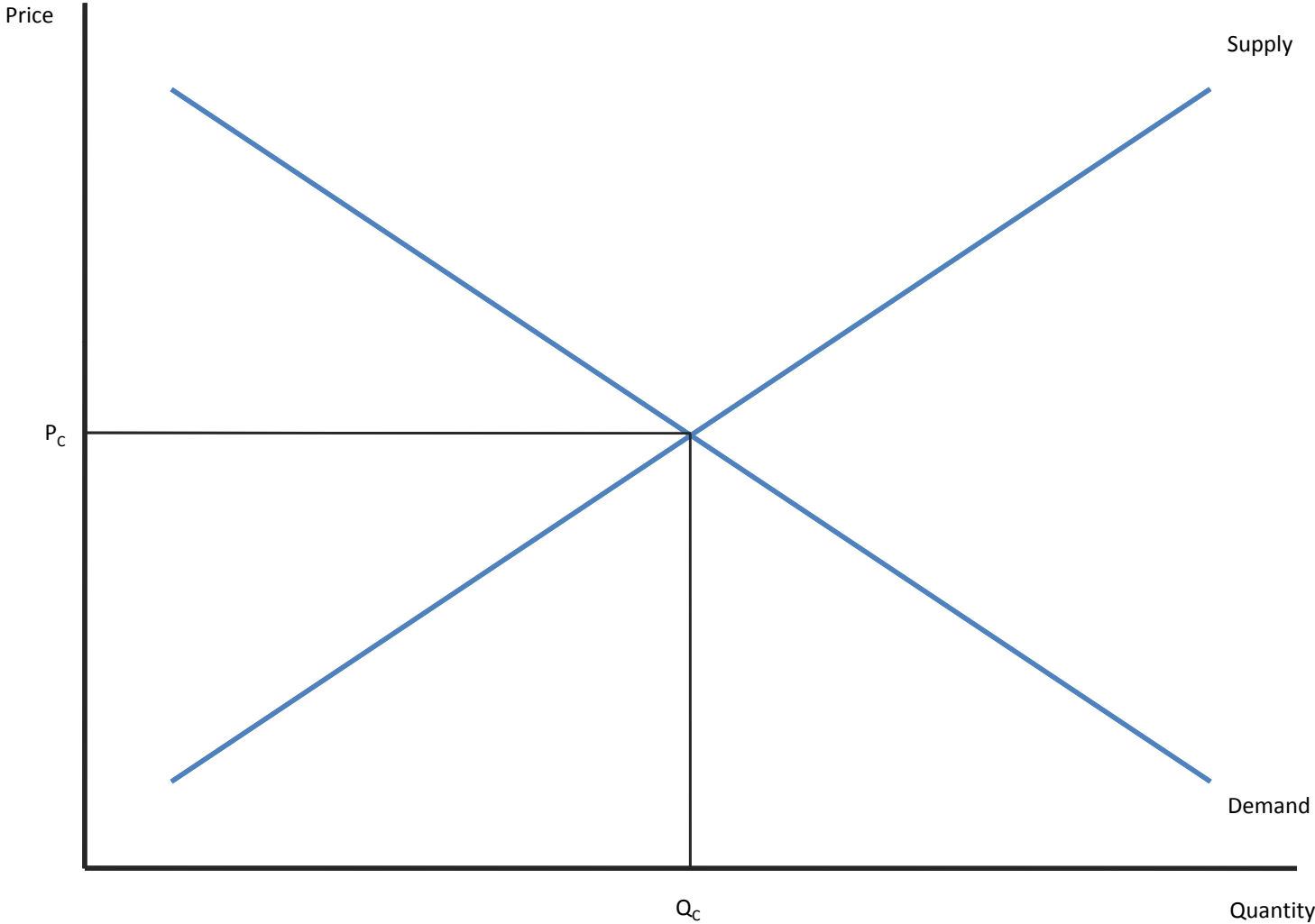


Figure 2
Equilibrium in a Market with Market Power

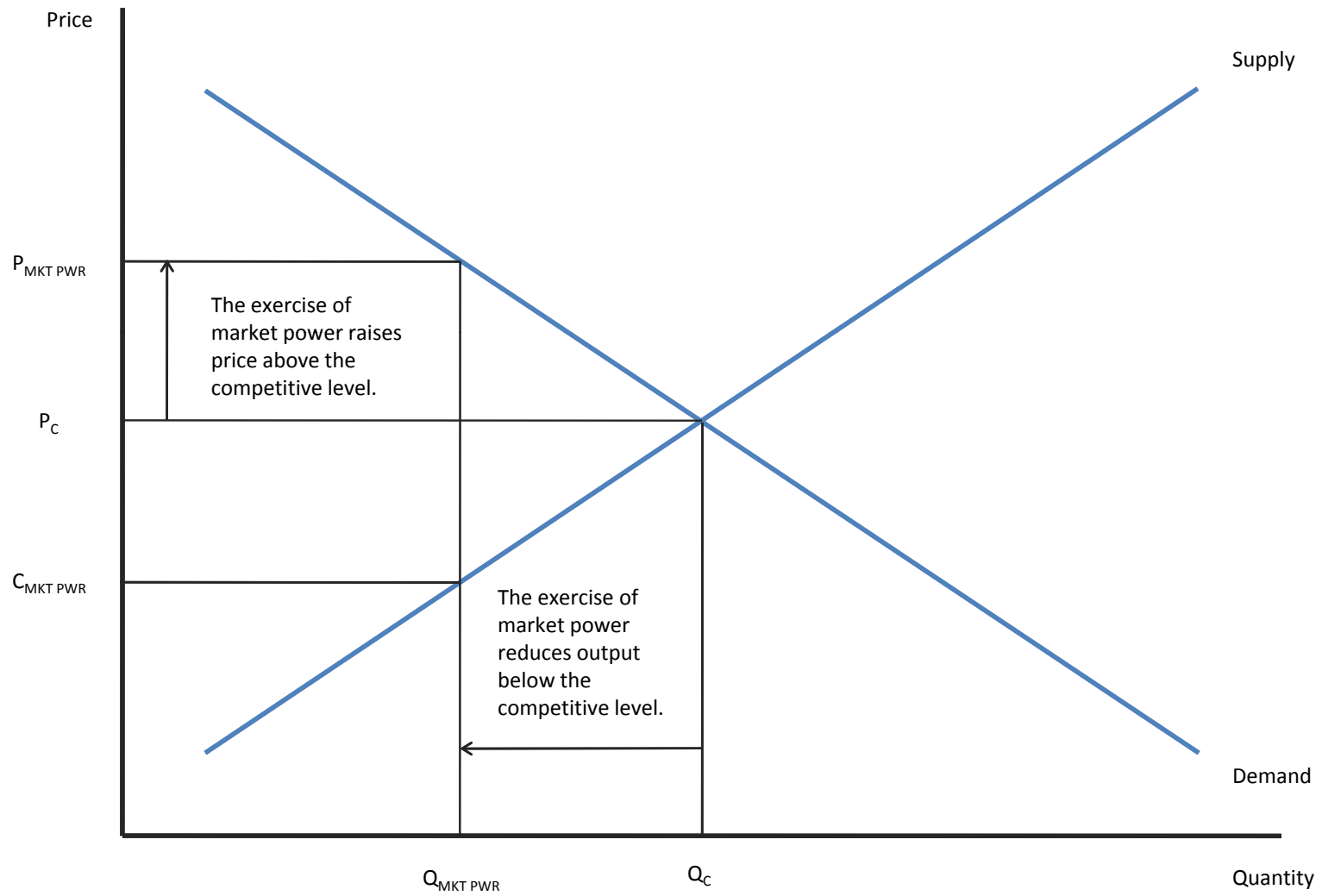


Figure 3

Competitive Equilibrium in a ITQ-Regulated Fishery with Binding TAC

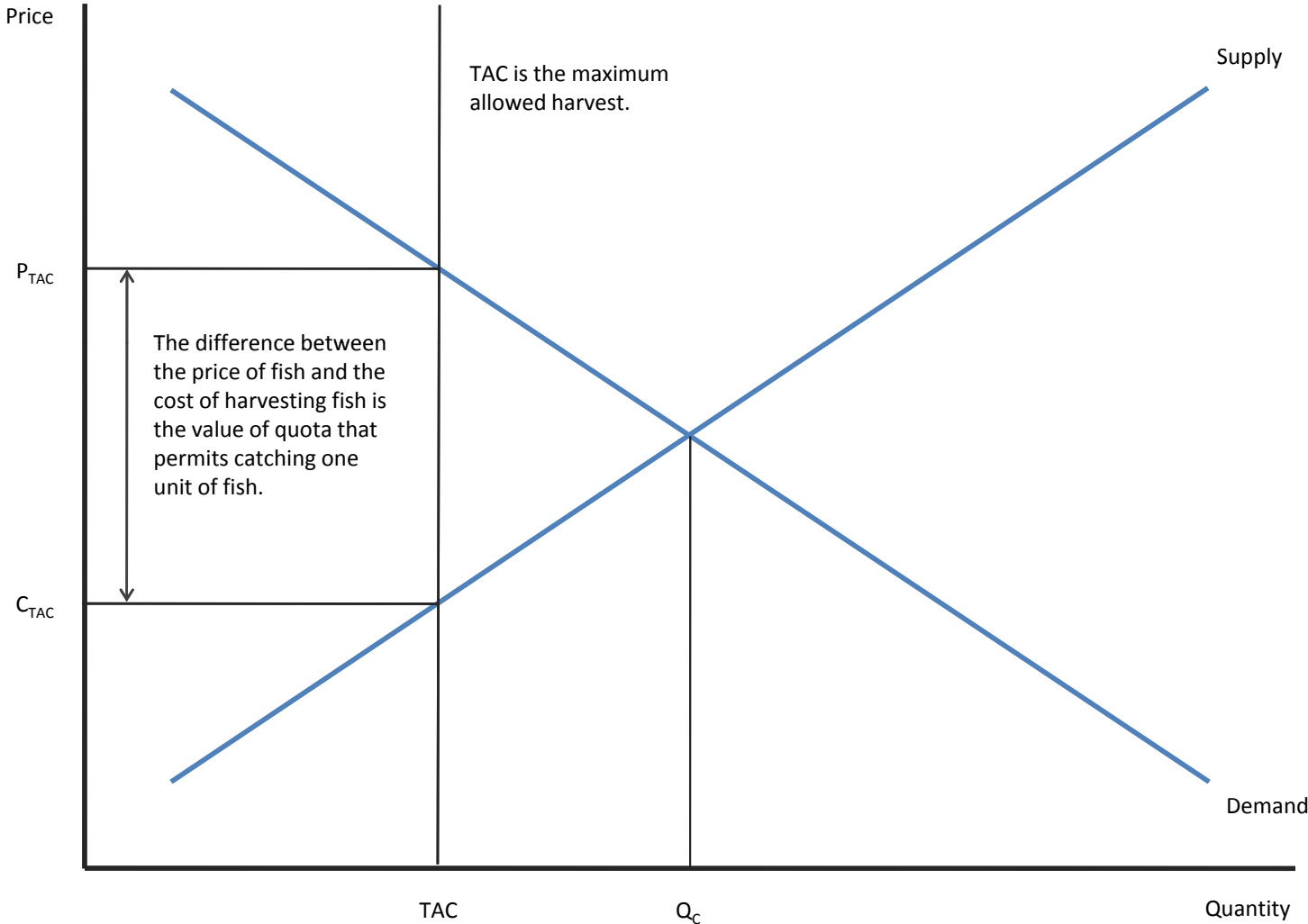


Figure 4
Competitive Equilibrium in a Fishery with Non-Binding TAC

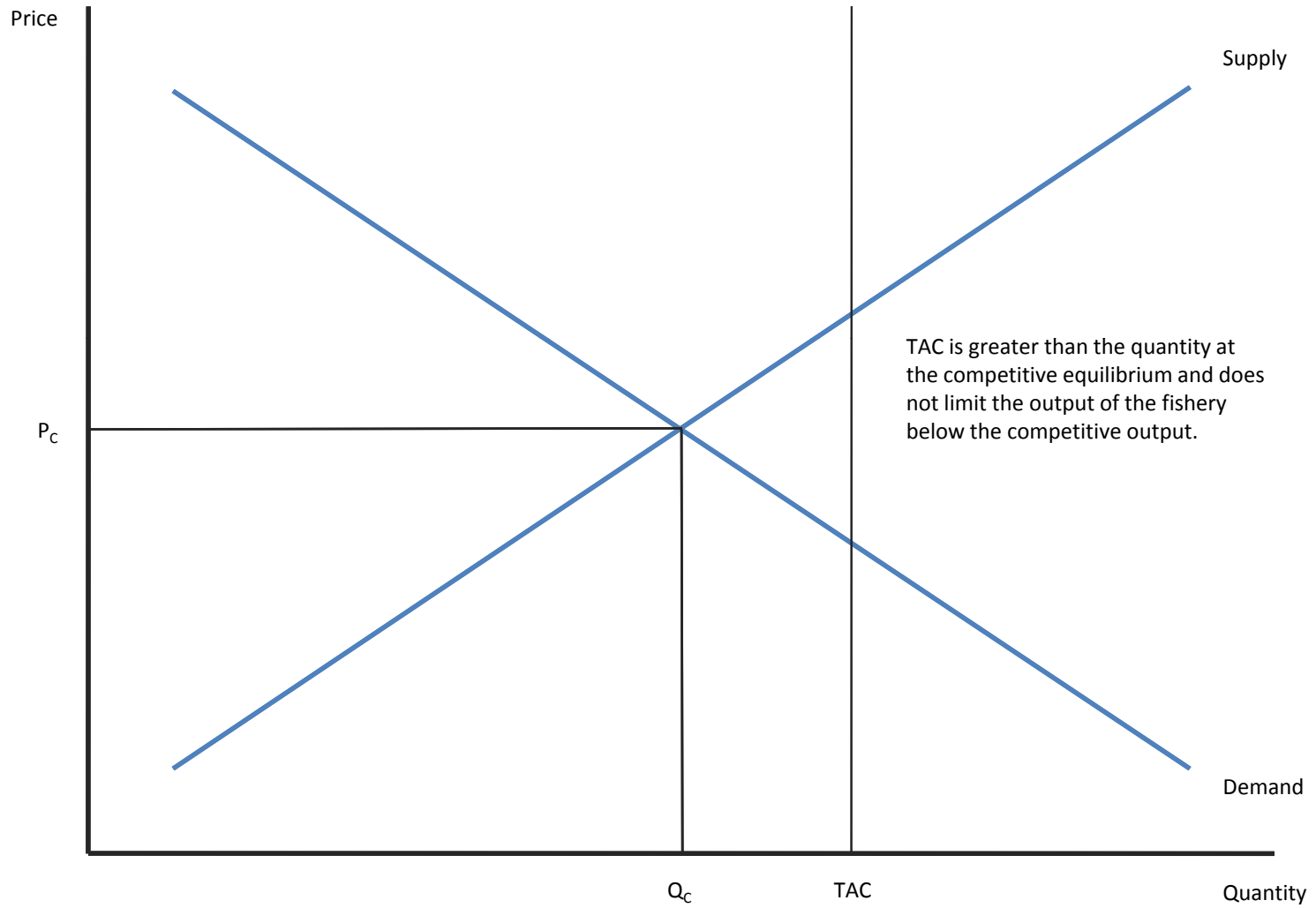


Figure 5

Competitive Equilibrium in a ITQ-Regulated Fishery with Binding TAC

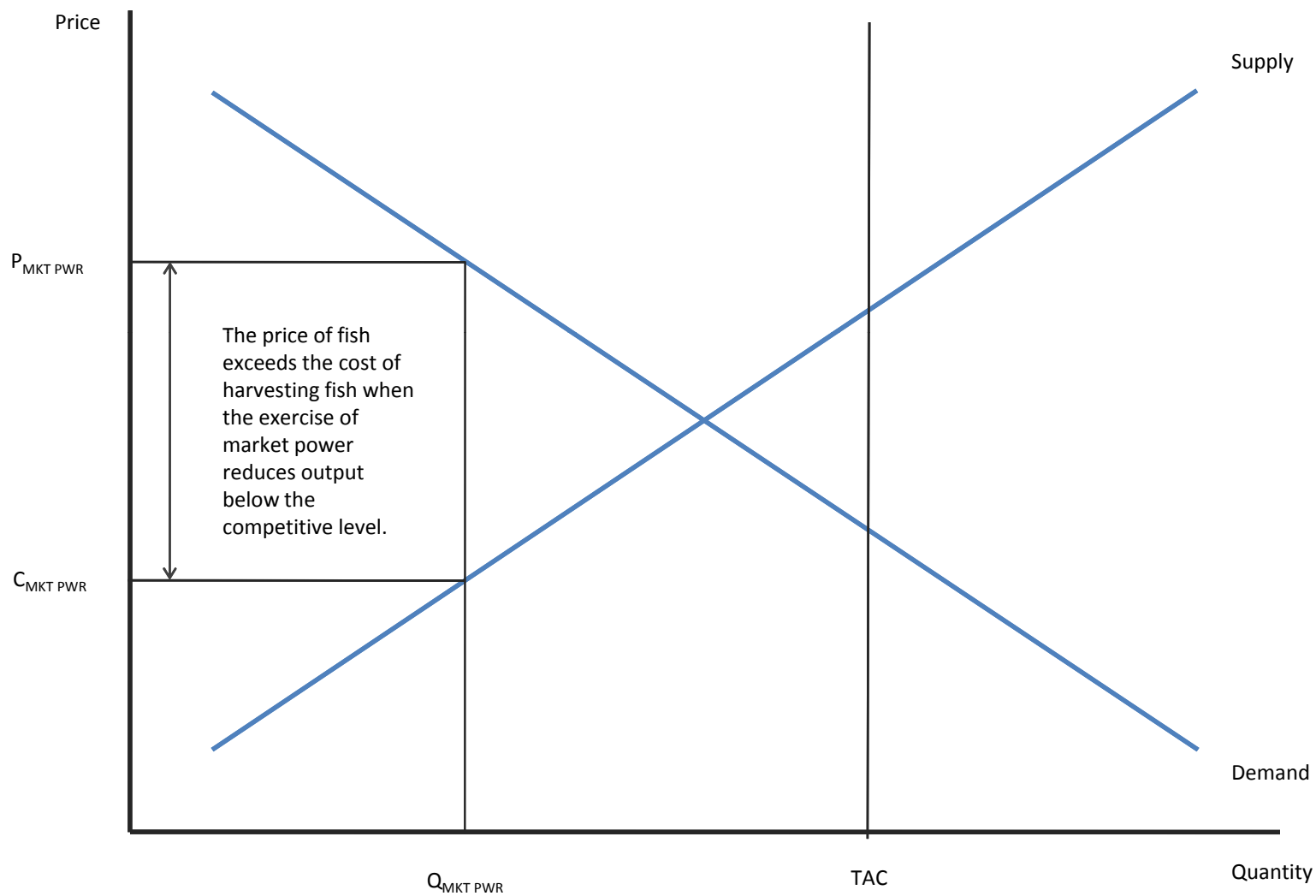


Figure 6

Share of Surfclam and Ocean Quahog Harvest by Processors

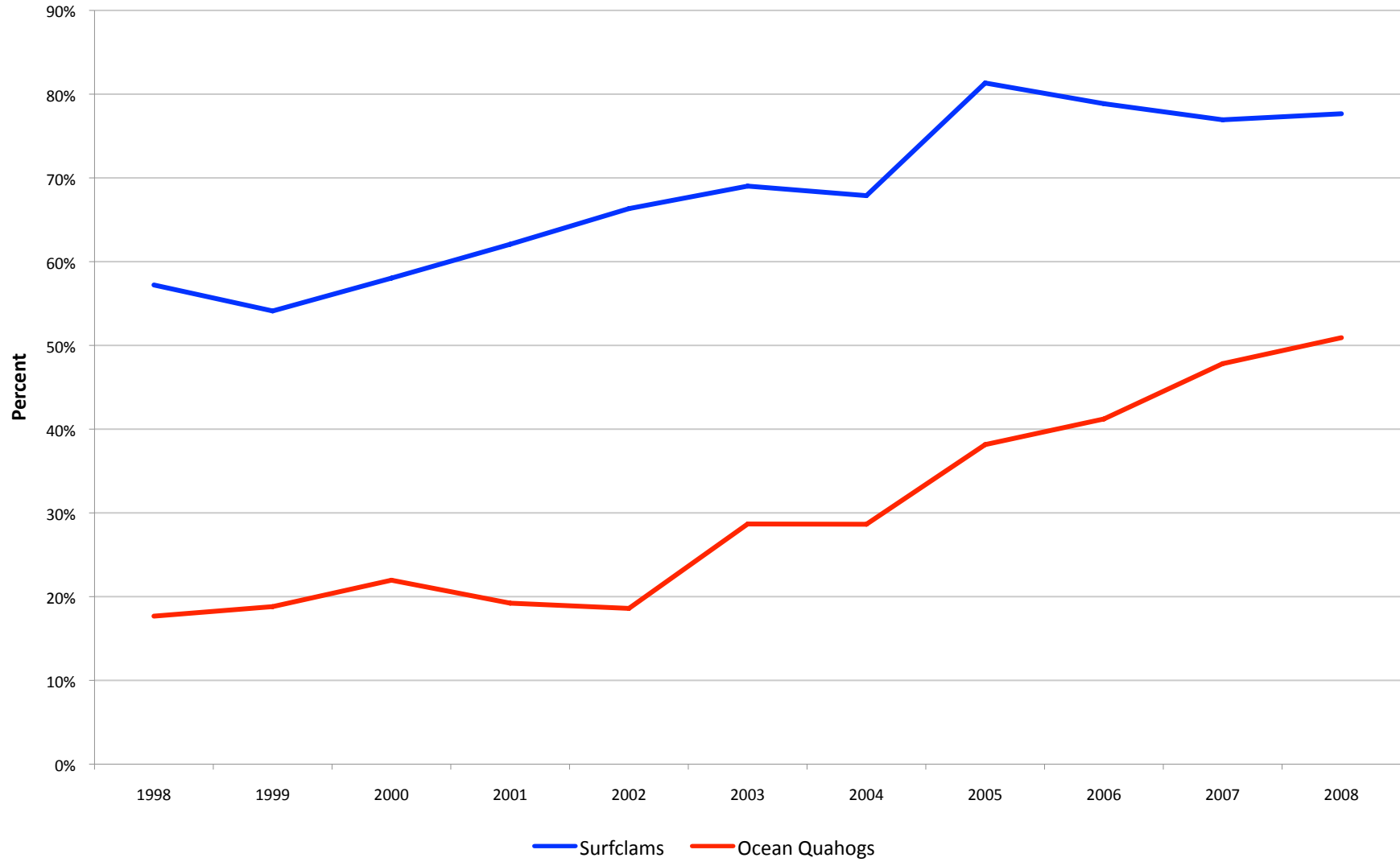


Figure 7

New York and New Jersey Surfclam Harvest v. Federal Fishery Harvest

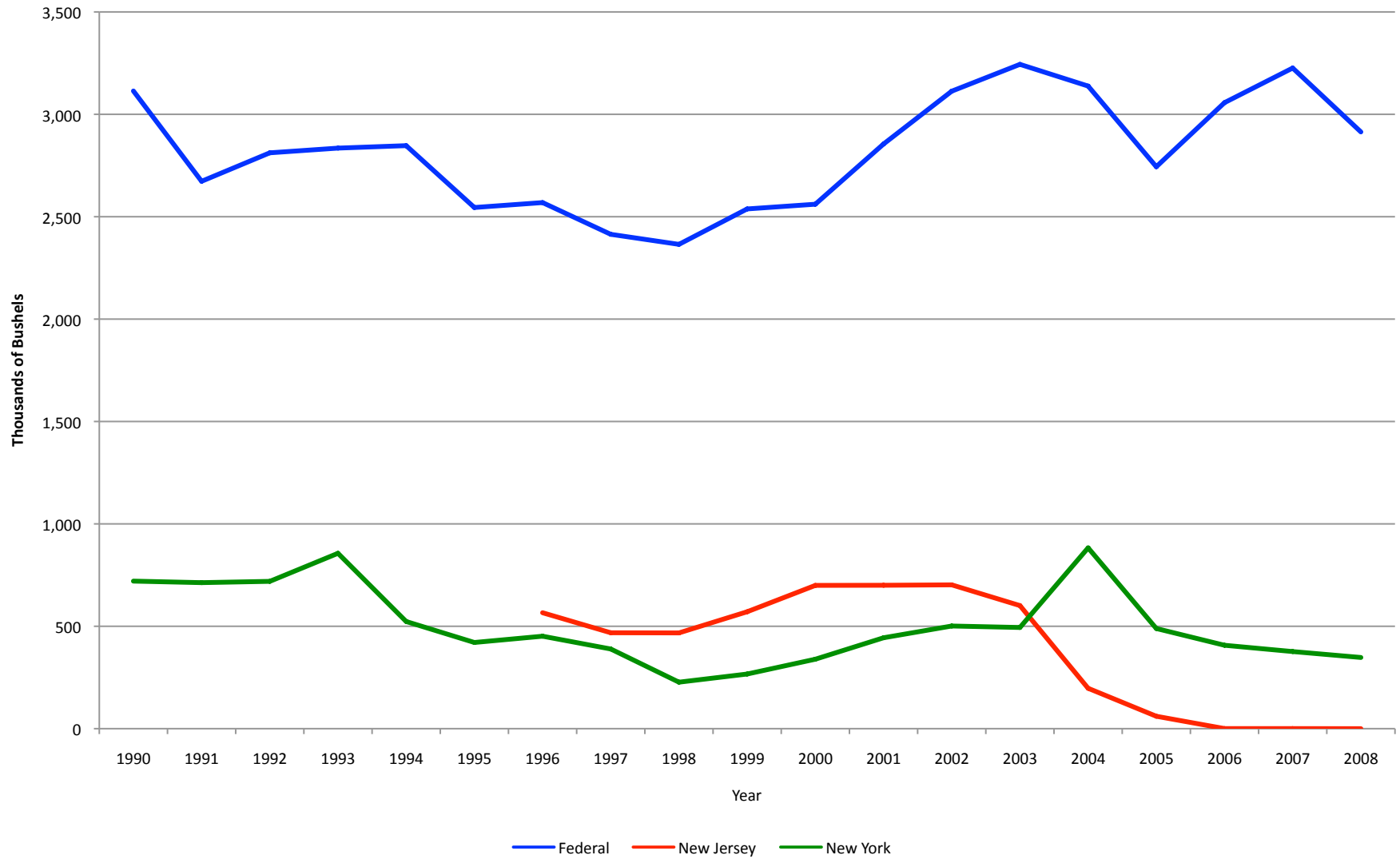


Figure 8
Federal Surfclam and Ocean Quahog Harvest v. U.S. Clam Imports and Exports
2008
(Thousands of pounds)

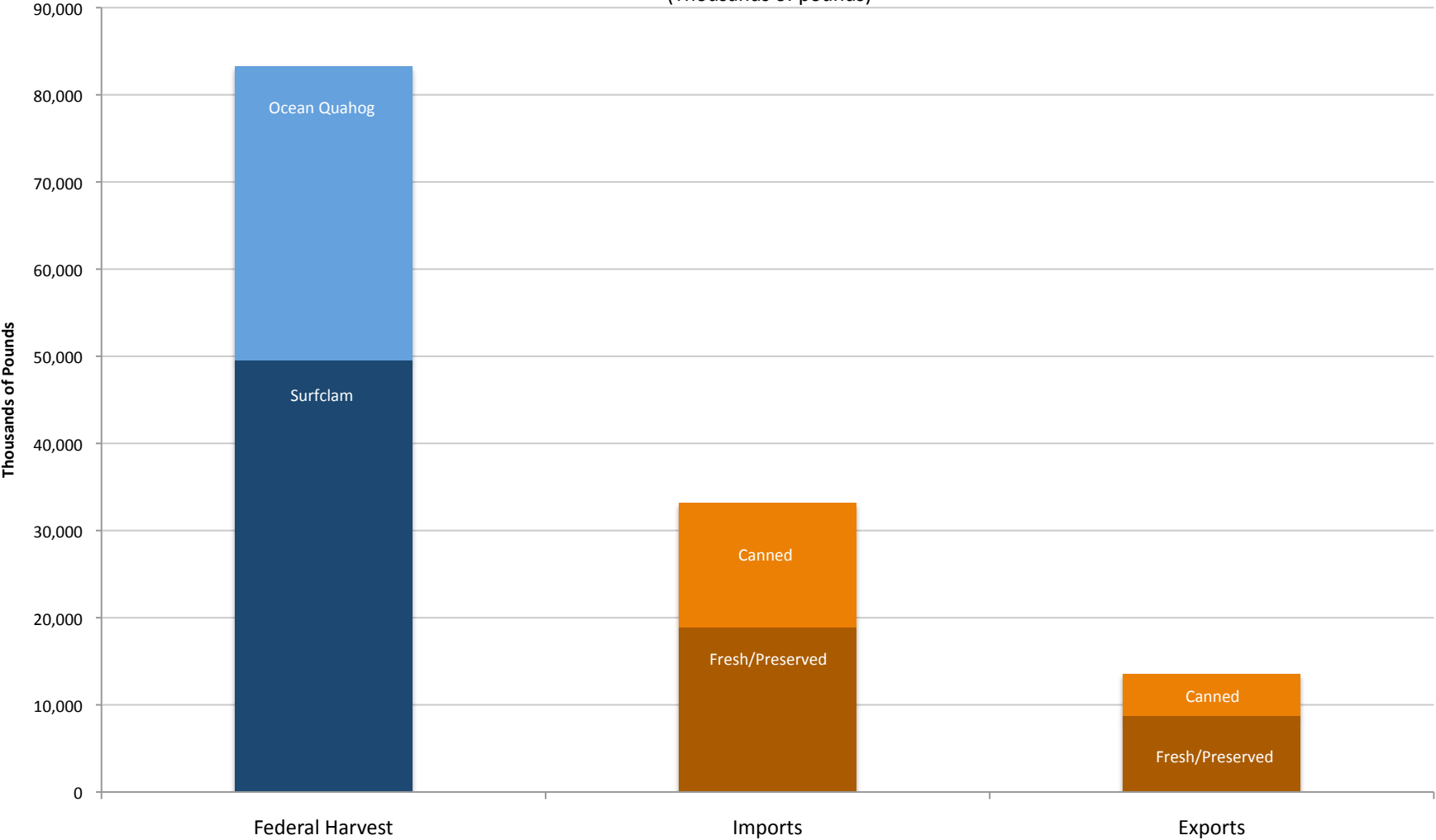


Figure 9

Surfclam Landings, Quota and Percent of Quota Landed

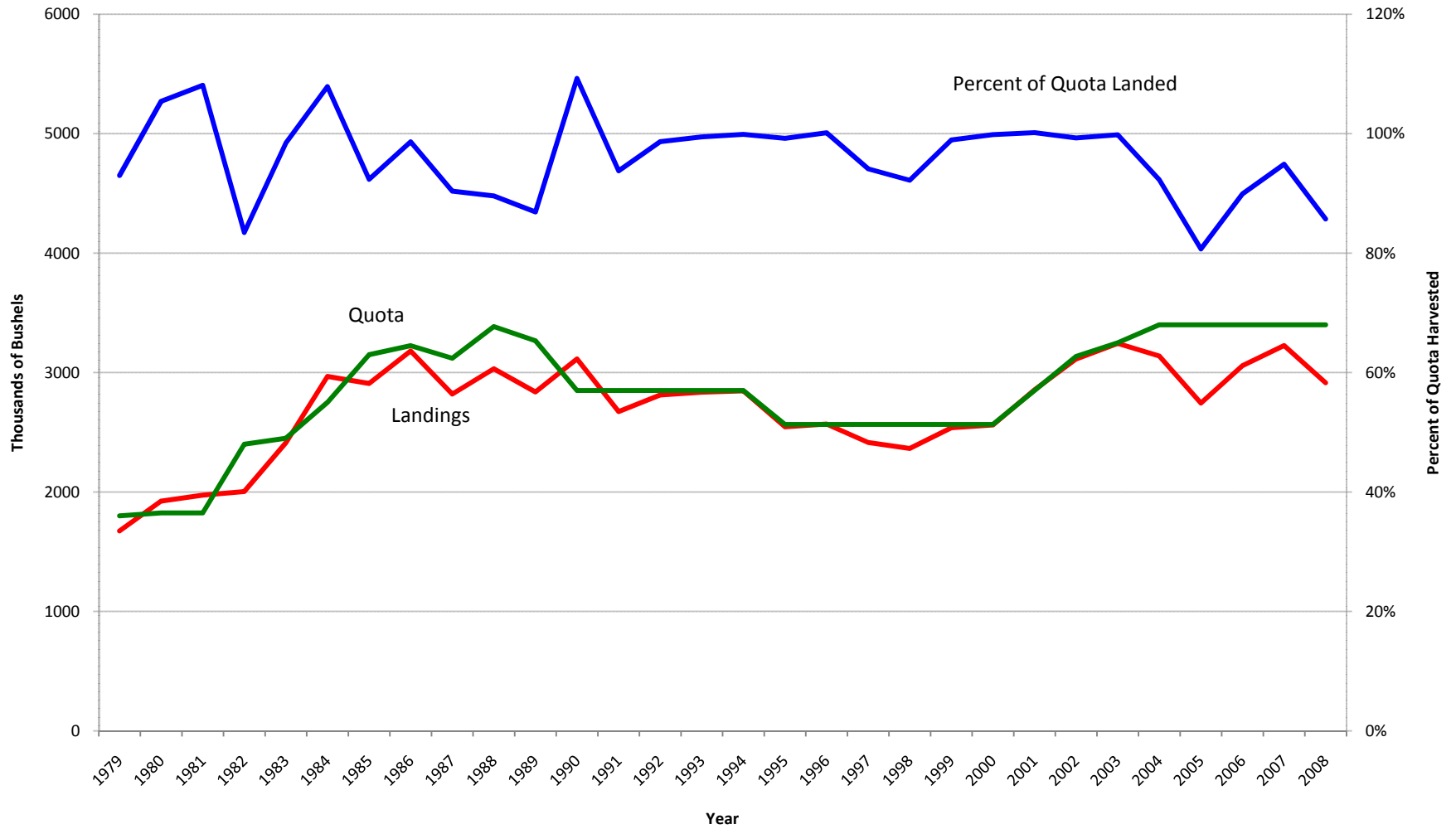


Figure 10

Ocean Quahog Quota, Landings, and Percent of Quota Landed

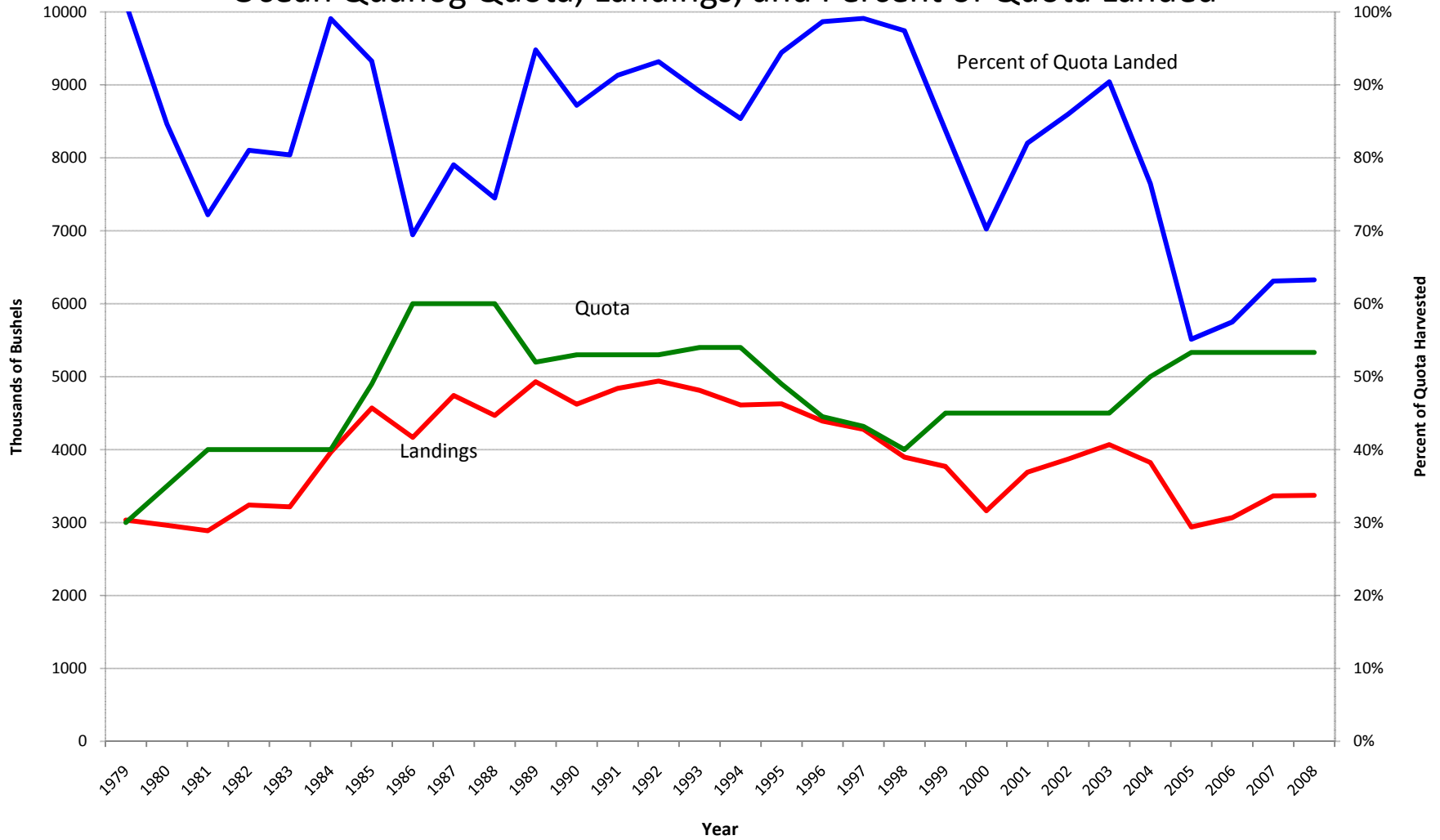


Figure 11
Surfclam and Ocean Quahog Landings per Unit Effort
(Bushels per Hour)

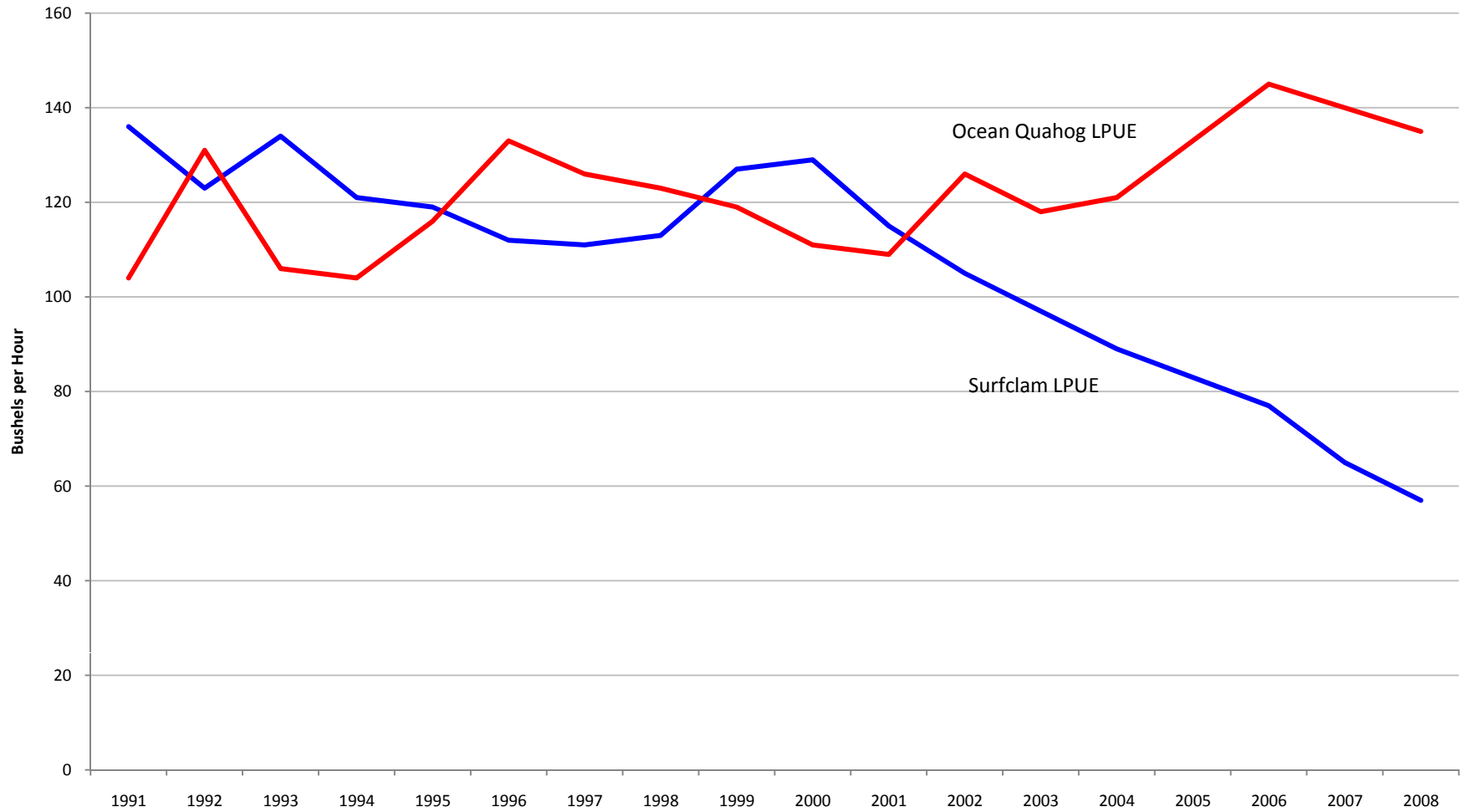
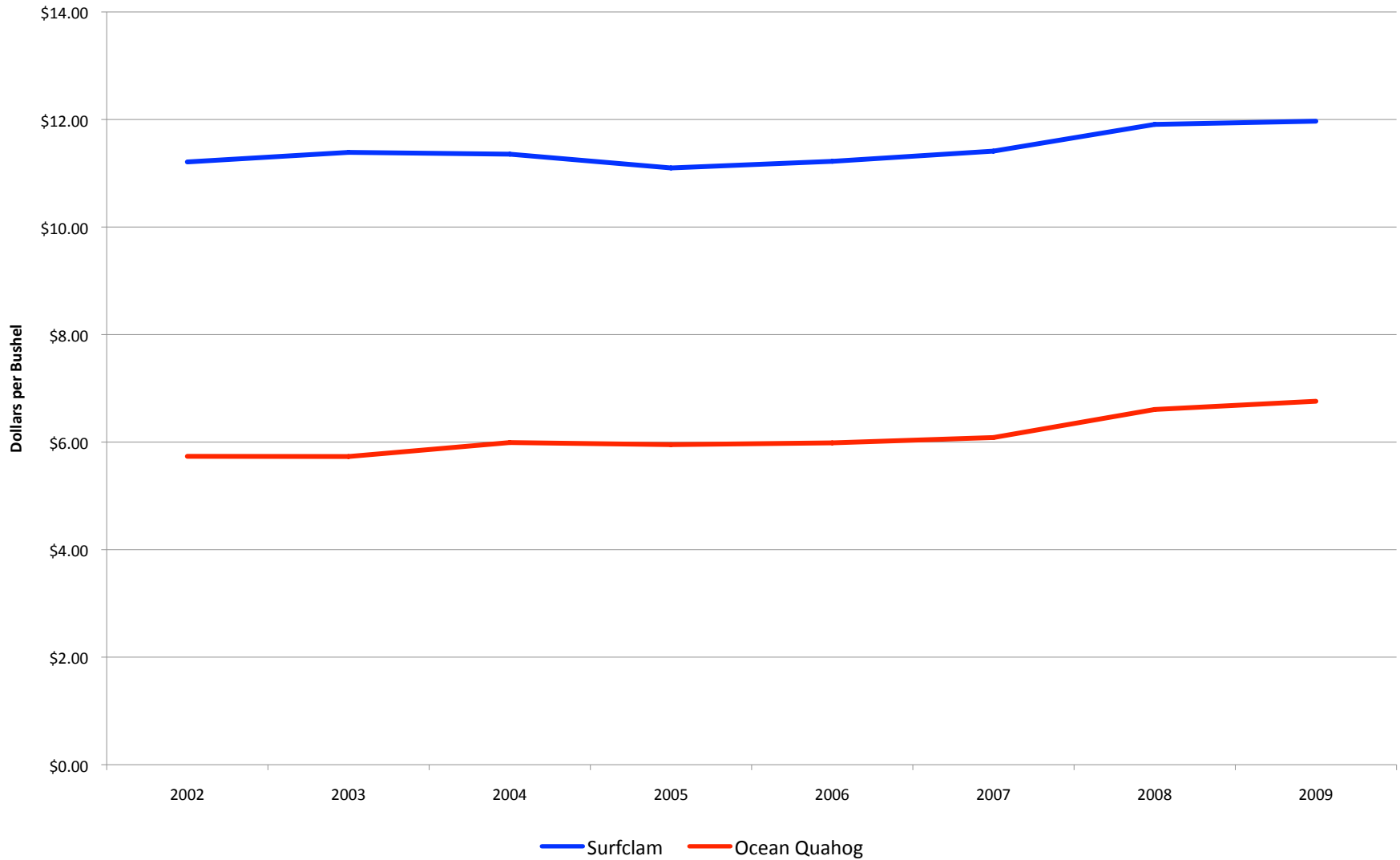


Figure 12

Surfclam and Ocean Quahog Prices Paid by Processors



2009 data through April 12, 2009.

Figure 13

Analysis of Effective Quota Concentration by Share Cap, Size of Competitive Fringe, and Competition from Non-SCOQ Clams

Scenario 1: Non-SCOQ Clams as Percent of TAC = 0%

Maximum HHI by Level of Share Cap and Aggregate Share Held By Fringe Quota Holders							
Share Cap	Percent Fringe						
	0%	5%	10%	15%	20%	25%	30%
20%	2000	1825	1700	1625	1600	1425	1300
25%	2500	2275	2100	1975	1900	1875	1650
30%	2800	2725	2700	2425	2200	2025	1900
35%	3350	3075	2850	2675	2550	2475	2450
40%	3600	3425	3300	3225	3200	2825	2500
45%	4150	4075	4050	3625	3250	2925	2650
50%	5000	4525	4100	3725	3400	3125	2900
55%	5050	4625	4250	3925	3650	3425	3250
60%	5200	4825	4500	4225	4000	3825	3700
65%	5450	5125	4850	4625	4450	4325	4250
70%	5800	5525	5300	5125	5000	4925	4900

Scenario 2: Non-SCOQ Clams as Percent of TAC = 10%

Maximum HHI by Level of Share Cap and Aggregate Share Held By Fringe Quota Holders							
Share Cap	Percent Fringe						
	0%	5%	10%	15%	20%	25%	30%
20%	1653	1508	1405	1343	1322	1178	1074
25%	2066	1880	1736	1632	1570	1550	1364
30%	2314	2252	2231	2004	1818	1674	1570
35%	2769	2541	2355	2211	2107	2045	2025
40%	2975	2831	2727	2665	2645	2335	2066
45%	3430	3368	3347	2996	2686	2417	2190
50%	4132	3740	3388	3079	2810	2583	2397
55%	4174	3822	3512	3244	3017	2831	2686
60%	4298	3988	3719	3492	3306	3161	3058
65%	4504	4236	4008	3822	3678	3574	3512
70%	4793	4566	4380	4236	4132	4070	4050

Figure 13

Analysis of Effective Quota Concentration by Share Cap, Size of Competitive Fringe, and Competition from Non-SCOQ Clams

Scenario 3: Non-SCOQ Clams as Percent of TAC = 20%

Maximum HHI by Level of Share Cap and Aggregate Share Held By Fringe Quota Holders							
Share Cap	Percent Fringe						
	0%	5%	10%	15%	20%	25%	30%
20%	1389	1267	1181	1128	1111	990	903
25%	1736	1580	1458	1372	1319	1302	1146
30%	1944	1892	1875	1684	1528	1406	1319
35%	2326	2135	1979	1858	1771	1719	1701
40%	2500	2378	2292	2240	2222	1962	1736
45%	2882	2830	2813	2517	2257	2031	1840
50%	3472	3142	2847	2587	2361	2170	2014
55%	3507	3212	2951	2726	2535	2378	2257
60%	3611	3351	3125	2934	2778	2656	2569
65%	3785	3559	3368	3212	3090	3003	2951
70%	4028	3837	3681	3559	3472	3420	3403

Scenario 4: Non-SCOQ Clams as Percent of TAC = 40%

Maximum HHI by Level of Share Cap and Aggregate Share Held By Fringe Quota Holders							
Share Cap	Percent Fringe						
	0%	5%	10%	15%	20%	25%	30%
20%	1020	931	867	829	816	727	663
25%	1276	1161	1071	1008	969	957	842
30%	1429	1390	1378	1237	1122	1033	969
35%	1709	1569	1454	1365	1301	1263	1250
40%	1837	1747	1684	1645	1633	1441	1276
45%	2117	2079	2066	1849	1658	1492	1352
50%	2551	2309	2092	1901	1735	1594	1480
55%	2577	2360	2168	2003	1862	1747	1658
60%	2653	2462	2296	2156	2041	1952	1888
65%	2781	2615	2474	2360	2270	2207	2168
70%	2959	2819	2704	2615	2551	2513	2500