

Catch Share Management in New England: Groundfish Sectors

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ABSTRACT:

The management of domestic fisheries by the use of catch shares has become a topic of increased attention in recent years. The New England Fishery Management Council (NEFMC) recently voted to adopt a catch share program for their Northeast Multispecies Fishery, proposing the addition of 17 new sectors which will manage a collective quota for the multispecies complex. This paper discusses the specifics of the Fishery Management Plan amendment as it pertains to the sector program and highlights three potential concerns that have been raised with regard to the implementation of sectors: insufficient monitoring, excessive consolidation, and impacts on communities. An exploration of actions taken by other regional Fishery Management Councils to address these concerns provides insight into potential management options that the New England Fishery Management Council may wish to consider as they move forward. These options are evaluated in the context of New England's groundfish fishery, culminating in recommended actions that would enhance the ability of the management program to achieve its desired goals. Evaluation of the monitoring program in the British Columbia Groundfish Fishery reveals the potential benefits of full monitoring coverage for the Northeast Multispecies Sector program. Considering accumulation limits set in 10 domestic catch share programs to address consolidation reveals the need for the NEFMC to establish accumulation limits at a level commensurate with the management plan's total objectives. Lastly, drawing from experiences in several Alaska fisheries and the new Pacific Coast Groundfish Fishery IFQ program, utilizing an adaptive management approach would provide the NEFMC with tools to mitigate undesired impacts on fishing communities. The above recommendations have the potential to strengthen the New England multispecies sector program and increase the likelihood of achieving the full suite of management objectives.

LIST OF ACRONYMS:

IFQ: Individual Fishing Quota

IQ: Individual Quota

ITQ: Individual Transferable Quota

IVQ: Individual Vessel Quota

LAPP: Limited Access Privilege Program

DAP: Dedicated Access Privilege

TURF: Territorial User Rights in Fishing

MSA: Magnuson Stevens Fishery Conservation and Management Act

EEZ: Exclusive Economic Zone

FMC: Fishery Management Council

RFMC: Regional Fishery Management Council

FMP: Fishery Management Plan

NOAA: National Oceanic and Atmospheric Administration

NMFS: National Marine Fisheries Service

SSC: Science and Statistical Committee

ACL: Annual Catch Limit

AM: Accountability Measure

DAS: Days at Sea

OY: Optimum Yield

VMS: Vessel Monitoring System

TAC: Total Allowable Catch

PSC: Potential Sector Contribution

ACE: Annual Catch Entitlement

BSAI: Bearing Sea and Aleutian Islands

CDQ: Community Development Quota

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INTRODUCTION:

In the United States marine fisheries are a public trust resource, meaning that marine fisheries are to be managed for the benefit of all citizens.¹ The first National Standard for Fishery Conservation and Management in the Magnuson Stevens Fishery Conservation and Management Act (MSA) reflects this sentiment, instructing fishery managers to “prevent overfishing while achieving, on a continuous basis, the optimal yield from each fishery.”² Historically, U.S. fisheries have been open-access with no legal barriers to participation. As overfishing became apparent, restrictions were placed on the total allowable catch in many fisheries. One of the unforeseen results was a “race to fish” among participants competing to catch largest possible portion of the catch from the total quota.

This competition is a result of the economic dilemma known as the “Tragedy of the Commons,” introduced by Hardin in 1968, stating that in the absence of property rights, individual self interest will incentivize overexploitation of a commonly held resource.³ In open access fisheries, no incentive exists to restrict the exploitation of the resource when someone else can profit from their moderation.⁴ Catch share programs address this race-to-fish dynamic, which in an open access situation makes it difficult to achieve a sustainable and efficient fishery.⁵

Background on Catch Shares:

Catch share programs encompass a broad spectrum of fishery management systems, in which managers allocate portions of a fishery’s scientifically determined catch limit to a discrete set of individuals, groups or communities.⁶ Simply put, they are a way of slicing up the pie. This allows managers to determine who may participate in the fishery and set a

limit on the amount that each of those participants may catch. A fundamental assumption of catch share management is that individual privilege holders of a resource are more likely to make decisions that promote the health and sustained use of the resource.⁷

Catch share programs can take many forms, including Individual Fishing Quotas (IFQs), Individual Quotas (IQs), Individual Transferable Quotas (ITQs), Individual Vessel Quotas (IVQs), Dedicated Access Privileges (DAPs), Limited Access Privileges Programs (LAPPs), Territorial Use Rights in Fishing (TURFs), Cooperatives, and Sectors. These programs vary by the nature of privilege holders (vessels, individuals, communities, or groups), the transferability of privileges, and whether privileges are catch-based, area-based, or both. Each fishery is unique and managers can use these variations on catch share management to meet the biological, social, and economic needs of fisheries and fishing communities.⁸

Most fisheries in the US have historically been managed using input controls including restrictions on gear type, fishing areas, trip limits and length of the fishing season. Input controls are often an ineffective strategy for meeting specific management goals. They are also inefficient from a business perspective because they increase fishing effort and fixed costs while revenue remains constant or decreases. Catch shares are a form of output control, meaning that the total catch (output) is capped. Fishermen in a catch share fishery have more flexibility to fish when they choose, while considering weather conditions, safety at sea, and market demand. It is important to note that catch share management does not eliminate the need for input controls. For example, managers may implement gear restrictions to reduce habitat impact and/or minimize bycatch, or set time/area closures to protect spawning aggregations.

Catch share management began in the 1970s in Australia, New Zealand and Iceland, as a strategy for promoting safety at sea and improving economic performance in the fishing industry.⁹ Today, catch shares are used in over 25 countries, including Canada and the U.S.¹⁰ U.S. catch share programs emerged in the 1990s when Fishery Management Councils implemented IFQ programs in the Mid-Atlantic surf clam and ocean quahog, South Atlantic wreckfish, and North Pacific halibut and sablefish fisheries.¹¹ Currently, there are 15 catch share programs operating in the U.S. with several additional programs expected to come on line by 2011(Figure 1).¹²

Figure 1: Catch Share Programs by Region (Source: NOAA Office of Sustainable Fisheries)¹³



Institutional Structure of U.S. Fisheries Management:

The Magnuson Stevens Fishery Conservation and Management Act (MSA) is the overarching piece of legislation that governs the management of domestic fisheries within the United States Exclusive Economic Zone (EEZ). The original act, passed in 1976 established the management process that is still in effect today. The MSA mandated the establishment of eight regional Fishery Management Councils (FMCs): North Pacific, Pacific, Western Pacific, Gulf of Mexico, Caribbean, South Atlantic, Mid-Atlantic, and the New England. The MSA also set forth the Fishery Management Plan (FMP) process for determining management measures for fisheries. It is each council's responsibility to create and amend FMPs for all fisheries within its region that require conservation and management; in the case of New England groundfish, this responsibility resides with the New England Fishery Management Council (NEFMC). The National Marine Fisheries Service (NMFS), housed within the National Oceanic and Atmospheric Administration (NOAA), is responsible for and has the authority to approve FMPs recommended by the regional FMCs. Responsibility for enforcing the Fishery Management Plans resides with the United States Coast Guard in collaboration with NMFS.¹⁴

The New England Fishery Management Council (NEFMC) is comprised of eighteen voting members.¹⁵ Included are the regional director of NMFS and the principle state official with primary marine fishery management responsibility from each of the region's states (Maine, Rhode Island, Connecticut, New Hampshire and Massachusetts) as appointed by the Governor.¹⁶ In addition, there is one appointed obligatory member from each state and seven appointed at-large members from the region.¹⁷ The obligatory and at-large positions

are nominated by the respective state's governor and appointed by the Secretary of Commerce.¹⁸

The New England Council is supported by a staff of 18 people, including 10 technical staff who are responsible for maintaining and drafting the FMPs.¹⁹ Council members are distributed among nine standing oversight committees who are responsible for reviewing and developing FMPs and their associated amendments. Also included in the process are a required Scientific and Statistical Committee (SSC) and optional advisory panels, comprised of members of the fishing industry, scientist, and environmental advocates who aid the council in decision making.²⁰ The members of the oversight committee and advisory panel for the Northeast Multispecies FMP are listed in Table 1. The Science and Statistical Committee (SSC) is comprised of experts in economics, biology, social science and natural resource management.²¹ The SSC advises the council and determines the allowable biological harvest levels for the regions' managed fisheries.²²

Table 1: Groundfish Oversight Committee and Advisory Panel Members for year 2010 (Source: NEFMC Website) ²³	
Groundfish Oversight Committee	
Rip Cunningham	Committee Chair, NEFMC
Terry Stockwell	Vice Chair, NEFMC
Rodney Avila	NEFMC
Pat Kurkul	NEFMC
Mike Leary	NEFMC
Sally McGee	NEFMC
Jim Odlin	NEFMC
David Pierce	NEFMC
Dave Preble	NEFMC
Mary Beth Tooley	NEFMC
Erling Berg	MAFMC
Howard King	MAFMC
Groundfish Advisory Panel	
Vincent Balzano	Saco, ME
Carl Bouchard	Exeter, NH
Richard Canastra	No. Dartmouth, MA
Bill Gerencer	Bowdoin, ME
Robert Lane	No. Falmouth, MA
Jason Margeson	Brewster, MA
Jackie Odell	Gloucester, MA
Paul Parker	North Chatham, MA
Maggie Raymond	So. Berwick, ME
Arthur Rocque, Jr.	Storrs, ME
Geoff Smith	Brunswick ME
John Williamson	Kennebunk, ME

Catch Shares in the U.S.

The adoption of U.S. catch share programs in the 1990s resulted in heated debate regarding the effectiveness, economic repercussions, and fairness of IFQ programs.²⁴ Responding to this controversy, Congress placed a moratorium on new IFQ programs in 1996 until further study could be conducted.²⁵ After the moratorium expired on October 1, 2000, Councils

continued to develop additional share based programs.^{i 26} The Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (MSRA) ended years of debate by explicitly authorizing Councils to use Limited Access Privilege (LAP)ⁱⁱ programs.²⁷ In addition to the act's endorsement of LAPs, it also stipulates a referendum provision for the adoption of Individual Fishing Quota programs (IFQs) in the New England and Gulf of Mexico Councils.²⁸ Thus, the NEFMC can only adopt an IFQ if approved by a two-thirds majority of voting eligible permit holders.²⁹ This provision only applies to individual catch share programs, and therefore does not apply to the groundfish sector program.

The 2006 MSA Reauthorization provides councils with a lot of latitude in developing catch share program; however, it does set forth several requirements. For example, it established U.S. citizenship or affiliation as a tenant for eligibility, requires monitoring and enforcement of the programs, and requires cost recovery of the incremental costs of catch share management that exceed those of traditional management.³⁰ The MSRA also stipulates a maximum of ten years permit duration, with the expectation of renewal unless the permits are limited, modified or revoked.³¹ Though this can give catch share permits a sort of rolling permanence, they are by no means permanent in the same respect as property rights. The legislation and NMFS have been very clear that though catch shares are a rights-based management technique, they do not confer actual property rights but

ⁱ The Gulf of Mexico Red Snapper IFQ was developed during the moratorium but not implemented until 2007 (Keithley Jr. W.R. FAO 2001 *Initial allocation of ITQs in the Gulf of Mexico red snapper fishery*, Case Studies on the allocation of transferable quota rights in fisheries.)

ⁱⁱ The term "Limited Access Privilege Program" was used by NMFS to include the variety of different catch share programs that adhere with the provisions outlined in the MSA. The National Marine Fisheries Service has recently adopted the blanket term "catch share" to replace "limited access privilege program".

rather a revocable privilege to harvest a certain amount of the resource.³² Furthermore, any catch share program must be consistent with the ten National Standards for Fishery Management and Conservation §16 U.S.C. 1851 (Table 2).

Table 2: MSA National Standards for Fishery Management and Conservation (Source: §16 U.S.C. 1851) ³³		
16 U.S.C. 1851		
MSA § 301		
TITLE III—NATIONAL FISHERY MANAGEMENT PROGRAM		
SEC. 301.	NATIONAL STANDARDS FOR FISHERY CONSERVATION AND MANAGEMENT	16 U.S.C. 1851
(a) IN GENERAL.—Any fishery management plan prepared, and any regulation promulgated to implement any such plan, pursuant to this title shall be consistent with the following national standards for fishery conservation and management:		
98-623	(1) Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.	
	(2) Conservation and management measures shall be based upon the best scientific information available.	
	(3) To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.	
	(4) Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.	
104-297	(5) Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.	
	(6) Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.	
	(7) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.	
104-297, 109-479	(8) Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirements of paragraph (2), in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.	
104-297	(9) Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.	
104-297	(10) Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.	

In addition to authorizing the use of LAPs in domestic fisheries, the 2006 MSRA also instructed councils to end and prevent overfishing by 2010 for fisheries that are subject to overfishing or categorized as overfished. The act also mandated that every management plan must contain set Annual Catch Levels (ACLs) which set the cap on the total catch allowed for the fishery, and adopt Accountability Measures (AMs) for each fishery that detail the actions to be taken if ACLs are exceeded.³⁴

Recent Developments – NOAA Policy on Catch Shares:

With a new administration in the White House and at NOAA, catch shares have come into the spot light of fisheries management policy. Dr. Jane Lubchenco, Administrator of NOAA created a Catch Shares Task Force in June of 2009. Members of the task force include a variety of regional Council members and NOAA staff. NOAA is currently assessing the benefits of catch share programs and seeking to address any challenges in their development and implementation.³⁵ The task force has five formal objectives:

1. To develop a new NOAA policy on catch shares that ensures that catch shares are fully considered when Councils take up fishery management plan amendments.
2. To make sure that Councils that want to move forward with catch shares have the technical and administrative support to move quickly to design a catch share system while empowering local fishermen to be part of the process.
3. To make sure that catch share designs achieve the best possible environmental and economic performance by supporting healthy ecosystems, reducing bycatch and habitat damage, and helping to meet annual catch limits.
4. To consider whether any organizational changes are needed within NOAA to provide the best possible communication and support.
5. To provide advice to the under secretary on how to allocate resources to the Councils to support this work, and how to create milestones so that progress can be evaluated.³⁶

NOAA released a draft policy on the use of catch shares in December 2009, and are accepting public comment until April 10, 2010 and attending the winter 2009/2010 round of Regional Fishery Management Council meetings to solicit feedback. The formal catch share policy is as follows:

To achieve long-term ecological and economic sustainability of the Nation's fishery resources and fishing communities, NOAA encourages the consideration and adoption of catch shares wherever appropriate in fishery management and ecosystem plans and amendments and will support the design, implementation, and monitoring of catch share programs.³⁷

NOAA will collaborate with federal and state agencies and partners to support the consideration and use of catch shares in the following categories:

1. Reduce technical and administrative impediments to designing catch share programs;
2. Provide expertise and related support to assist development of new catch share programs;
3. Inform and educate stakeholders so that they can best participate in the design and implementation of catch share programs;
4. Coordinate data collection, research and performance monitoring of catch share programs³⁸

The task force has identified a series of tangible actions specific to the above categories to ensure successful catch share programs (Appendix 1).

Some of the actions identified to *reduce technical and administrative impediments to designing catch share programs* include evaluating fishery characteristics that may indicate particular applicability of catch shares, and creating a model design to outline the necessary steps in designing a catch share program. The creation of nationally applicable frameworks such as a common catch share infrastructure and enforcement protocols would help identify standardized methods and best practices as well as outline roles and

responsibilities. The draft policy also suggests creating a specific policy guidance document to address the technical interpretation of the 2006 MSA amendments and promote consistent application of catch shares.³⁹

In order to *provide expertise and related support to assist development of new catch share programs*, the task force recommends providing support to NMFS regions, Councils, states and stakeholders to assist in the design, transition period and operation of catch share programs, including providing access to experts. Establishing a pool of experts to assist Councils and NOAA in designing catch share programs was a particularly important avenue identified. Among the other steps outlined are actions directed at fishery participants such as developing business analysis and decision tools to help individuals examine the potential impacts of different management options on their business, and working with fishery groups to develop innovative fishery management options.⁴⁰

Several educational avenues are identified in the draft policy to *inform and educate stakeholders so that they can best participate in the design and implementation of catch share programs*. These avenues include implementing a long-term outreach strategy to ensure stakeholders are engaged in the implementation of the catch share policy, creating a virtual information center to provide access to the best available scientific information, and implementing an 18-month schedule of regional workshops and webinars to actively engage stakeholders and provide relevant information. Also proposed is to establish an agency wide consulting group to help coordinate and capitalize on the expertise within the NMFS regions.⁴¹

To effectively *coordinate data collection, research and performance monitoring of catch share programs*, the task force recommends establishing a nationwide electronic reporting goal for all fisheries to improve accuracy, timeliness and completeness of reporting. As the question of monitoring is often raised in transition to catch shares, a work group to provide guidance on observer program design is proposed. Additional actions identified are conducting a comprehensive research program on catch shares and establishing relevant performance measures and criteria.⁴²

While by no means blindly advocating for the widespread adoption of catch share programs, the administration has cited recent scientific studies that have demonstrated their ability to eliminate the race to fish, reduce overcapacity, reduce bycatch, improve economic efficiency, create individual accountability, and foster stewardship of the resource.⁴³ The Task Force has concluded that it is in the best interest of the public good to support the exploration of catch shares as a means to achieve management goals in U.S. Fisheries.⁴⁴

NEW ENGLAND GROUND FISH FISHERY

The Resource:

All groundfish species, as the name implies, live near the ocean floor and feed on benthic organisms. Found throughout New England waters from southern New England to the Gulf of Maine, all fifteen groundfish species exhibit distinct body types, behaviors and habitat preferences. Most groundfish in New England are managed under a single plan, the Northeast Multispecies FMP. Prior to 2000, all groundfish were managed under this FMP when Amendment 12 created a separate FMP to manage three species (silver hake, red hake, and offshore hake) under the Small Mesh Multispecies program. The Northeast Multispecies FMP now covers 12 groundfish species: Atlantic cod, haddock, pollock, yellowtail flounder, witch flounder, winter flounder, windowpane flounder, American plaice, Atlantic halibut, redfish, ocean pout and white hake.⁴⁵

Several of these species inhabit multiple geographic locations, thus the 12 groundfish species are managed as 20 geographically distinct stocks. Many of these stocks have long been subject to overfishing; currently, two thirds of these stocks are overfished or undergoing overfishing (Table 3). The spatial relationship of the different groundfish species presents management challenges. Bycatch is a significant concern as it is difficult to fully utilize the healthy stocks within the fishery without catching other species whose stocks are overfished.⁴⁶

Table 3: Current Status of Stocks Managed Under the Northeast Multispecies FMP (Source: Recreated from Table 1 – Stock status summary and targeted rebuilding dates (based on GARM III, DPWG), p.7 of the Northeast Multispecies FMP Amendment 16)⁴⁷

Species	Overfishing?	Overfished?	Rebuilding Date
Cod (GB)	Yes	Yes	2026
Cod (GOM)	Yes	No	2014
Haddock (GB)	No	No	Rebuilt
Haddock (GOM)	No	No	Rebuilt
Yellowtail Flounder (GB)	Yes	Yes	2014
Yellowtail Flounder (SNE/MA)	Yes	Yes	2014
Yellowtail Flounder (CC/GOM)	Yes	Yes	2023
American Plaice GB/GOM	No	No	2014
Witch Flounder	Yes	Yes	2017
Winter Founder (GB)	Yes	Yes	2017
Winter Flounder GOM	Unknown	Unknown	
Winter Flounder SNE/MA	Yes	Yes	2014
Redfish	No	No	2051
White Hake GB/GOM	Yes	Yes	2014
Pollock GB/GOM	Yes	Yes	2017
Windowpane Flounder GB/GOM	Yes	Yes	2017
Windowpane Flounder SNE/MA	Yes	Yes	2014
Ocean Pout	No	Yes	2014
Atlantic Halibut	No	Yes	2055
Atlantic Wolffish	Unknown	Yes	

History of the Fishery:

The fishing industry in New England has a very long and deeply rooted history.

Groundfishing in New England began over 400 years ago, and was the first colonial industry in the United States. Prior to the introduction of steam powered trawlers during the industrial revolution, groundfish were caught using baited lines from schooners and their dories. Further technological advancements in the early 1900s of freezers and cold storage eventually replaced the salt cod market with a market for fresh and frozen fish, and shifted prosecution of cod stocks to haddock. This shift to haddock rapidly depleted the stocks off the New England coast as evidence by severe declines in landings during the middle of the 20th century, resulting in a northern shift of the fleet into Canadian waters.⁴⁸

After World War II, large distant water fleets began to exploit New England groundfish resources off of New England, particularly those off Georges Bank. These fleets, from countries such as the USSR, East Germany, Poland, Spain and Japan, were comprised of large factory ships which could exploit the resource at a dramatic rate not previously possible. Declining fish stocks and decreased domestic landings prompted the passage of the MSA, which established the 200 mile Exclusive Economic Zone (EEZ) in an effort to exclude international fleets from New England waters. The U.S. groundfish fleet built up capacity quickly, replacing wood trawlers with steel trawlers and incorporating small factory trawlers. This rapid increase in fishing effort, combined with ineffective management controls resulted in cascading collapse of the groundfish stocks in the 1980s, prompting the development of a management plan for New England's groundfish fishery.⁴⁹

Northeast Multispecies FMP:

The original Northeast Multispecies Fishery Management Plan was developed in 1986 with the objectives of controlling fishing mortality and rebuilding compromised stocks.⁵⁰ Since that time, there have been 16 FMP amendments (2 pending), and 44 framework adjustments (1 pending). The following paragraphs describe several relevant amendments to the FMP.

Amendment 5

Amendment 5 to the Northeast Multispecies FMP was implemented in 1994. Two major actions of this amendment included a moratorium on new vessel permits during the rebuilding period, and the implementation of a days-at-sea (DAS) effort reduction program. The DAS program operates by issuing permits to fishery participants that entitle them to fish a certain number of days in the season. The effort reduction program offered vessels two options: fleet-wide requirement of time out of groundfishing, or an individual vessel allocation of DAS as determined by historical performance. Both programs were subject to a six year gradual decrease in days-at-sea allowance.⁵¹

Amendment 7

Failing to sufficiently reduce fishing effort, Amendment 7 was adopted in 1996 to accelerate the DAS timeline in Amendment 5, and eliminate exemptions from the program. This amendment also established rebuilding programs for five overfished stocks, utilizing DAS controls, and minimum mesh size requirements and area closures.

Amendment 9

Amendment 9 was developed in 1999 to bring the FMP into compliance with the 1996 Sustainable Fisheries Act, establishing new overfishing definitions (status determination criteria) and setting Optimum Yield (OY) targets for the twelve groundfish species.⁵²

The above amendments were not effective in significantly reducing fishing mortality on groundfish stocks because of overcapacity and the amount of latent effort present in the fishery and the absence of specific, binding total quotas. To attempt to address the overcapacity issue, a federal buyback program was executed in 1996 and 1997, which purchased 79 active vessel permits. Given that the number of active vessels in the fishery remained constant over the next several years, previously inactive vessels likely reentered the fishery. Another buyback program was executed in 2001, this time purchasing 245 mostly inactive vessel permits. Despite the buy-backs and effort controls in place, the overall landing of groundfish still increased between 1994 and 2001.⁵³

Amendment 13

In December 2001, during the time the Council was drafting Amendment 13, the Conservation Law Foundation filed suit against NMFS, alleging the rebuilding plans implemented by NMFS were not consistent with the overfishing definitions outlined in Amendment 9. After negotiations between the various parties, Amendment 13 was developed to meet the requirements of the law and was implemented in 2004. The purpose of this amendment, consistent with the original FMP, is to end overfishing of groundfish stocks and rebuild all stocks that are overfished.⁵⁴

Amendment 13 implemented a wide suite of measures including new status determination criteria, formal rebuilding plans for all regulated groundfish stocks, dealer and vessel reporting requirements, and the required usage of Vessel Monitoring System (VMS) for all vessels managed by DAS. In order to control capacity, the amendment changed how days-at-sea may be used. DAS were broken down into three categories: Category A DAS can be used to fish any groundfish species subject to requirements of the FMP; Category B DAS can be used to fish only healthy stocks; Category C DAS are not active but may be retained and potentially reactivated in the future. Allocation of DAS to vessels is based upon fishing history between 1996 and 2001, provided a qualifying catch of 5,000 pound for each year. The resulting vessel effort, calculated based upon historical catch, would be distributed as 60% Category A DAS and 40% Category B DAS permits. In order to address latent capacity, many vessels that had not been active in the fishery were not awarded an allocation of either Category A or B DAS, effectively removing their permits from the fishery.⁵⁵

Although a number of permits were removed from the active fishery, the total DAS allocation was also reduced under Amendment 13, presenting a challenge for fishermen to remain economically viable under the reduced effort control.⁵⁶ To help buffer this impact, a DAS transfer program is also included in the Amendment to facilitate the exchange of DAS between limited access permit holders.⁵⁷ The DAS transfer program allows DAS to be transferred permanently between two vessels. The DAS leasing program allows DAS to be temporarily transferred from one permit holder to another. Both programs require that vessels be of similar length and fishing capacity.⁵⁸

In addition to the DAS management system, gear and area restrictions still apply to all participants regardless of permit category. The amendment also includes the use of trip limits which specify the amount of certain species which may be landed per fishing trip for Category A DAS permits.⁵⁹

Amendment 13 also included a mechanism for a group of fishermen to voluntarily operate as a sector. The formation of sectors required participants to develop a binding operation plan and contract with NMFS that would detail how the sector would ensure its catch would remain below its allocation. Sectors could apply for an allocation of one or more groundfish species, based upon the collective catch history of the participating vessels during the five year period prior to submission of a sector proposal. The sector would then be awarded an annual allocation, determined as a proportion of the sector's catch relative to the overall fishery catch, adjusted by the annual TAC. Sectors could fish this allocation collectively without some or all of the restrictions required for the common pool fishery: DAS limitations, trip limit and seasonal area closures.⁶⁰

Two sectors have been established to date: the Georges Bank Cod Hook Sector authorized by Amendment 13 in 2004 and the Georges Bank Fixed Gear Sector authorized by Framework 42 in 2006.⁶¹ Both sectors sought allocation only for cod and thus were not able to opt out of the DAS requirement, however, they are allowed to trade DAS within the sector irrespective of vessel size.⁶² An exception to the 5 year catch history formula was included in Amendment 13 for Georges Bank, allocating catch history based upon fishing years 1996 through 2001.⁶³ They are exempt from trip limits for cod and from the seasonal closure on Georges Bank.⁶⁴ The sectors also have the added benefit of being assured their

allocation will not be reduced unless as a consequence of a reduction in the overall cod TAC for which they receive a proportion.⁶⁵ Both the GB Hook and GB Fixed Gear Sectors have distributed their allocations to sector participants through the use of monthly quotas, which are fished competitively by each sector's members.⁶⁶

The Northeast Multispecies fishery is currently managed under Amendment 13 as described above. Under the DAS system, fishermen are still competing against a total catch limit, which entices fishermen to use their permits at the beginning of a season and to fish hard and fast to catch the most fish possible before the cap is reached and the fishery shuts down; the classic race to fish.

As of 2006 the groundfish fishery includes approximately 650 vessels, utilizing 33,000 days at sea over the course of 19,000 fishing trips. Several gear types are used to prosecute the fishery, most commonly bottom trawl and gillnets. Excluding monkfish and other retained bycatch species, the fishery landed about 50 million pounds of groundfish in 2006 valued at \$73 million dollars. Groundfish are landed most actively in Massachusetts, New Hampshire and Maine, with the Gloucester, MA port receiving the highest volume of landings.⁶⁷

Amendment 16:

The New England Fishery Management Council began developing Amendment 16 in 2006.⁶⁸ The goals and objective of the Amendment remain as described in Amendment 13 and are outlined in Table 4.⁶⁹

Goals of Amendment 16	
Goal 1:	Consistent with the National Standards and other required provisions of the Magnuson-Stevens Fishery Conservation and Management Act and other applicable law, manage the northeast multispecies complex at sustainable levels.
Goal 2:	Create a management system so that fleet capacity will be commensurate with resource status so as to achieve goals of economic efficiency and biological conservation and that encourages diversity within the fishery.
Goal 3:	Maintain a directed commercial and recreational fishery for northeast multispecies.
Goal 4:	Minimize, to the extent practicable, adverse impacts on fishing communities and shoreside infrastructure.
Goal 5:	Provide reasonable and regulated access to the groundfish species covered in this plan to all members of the public of the United States for seafood consumption and recreational purposes during the stock rebuilding period without compromising the Amendment 13 objectives or timetable. If necessary, management measures could be modified in the future to insure that the overall plan objectives are met.
Goal 6:	To promote stewardship within the fishery.
Objectives of Amendment 16	
Objective 1:	Achieve, on a continuing basis, optimum yield (OY) for the U.S. fishing industry.
Objective 2:	Clarify the status determination criteria (biological reference points and control rules) for groundfish stocks so they are consistent with the National Standard guidelines and applicable law.
Objective 3:	Adopt fishery management measures that constrain fishing mortality to levels that are compliant with the Sustainable Fisheries Act.
Objective 4:	Implement rebuilding schedules for overfished stocks, and prevent overfishing.
Objective 5:	Adopt measures as appropriate to support international transboundary management of resources.
Objective 6:	Promote research and improve the collection of information to better understand groundfish population dynamics, biology and ecology, and to improve assessment procedures in cooperation with the industry.
Objective 7:	To the extent possible, maintain a diverse groundfish fishery, including different gear types, vessel sizes, geographic locations, and levels of participation.
Objective 8:	Develop biological, economic and social measures of success for the groundfish fishery and resource that insure accountability in achieving fishery management objectives.
Objective 9:	Adopt measures consistent with the habitat provisions of the M-S Act, including identification of EFH and minimizing impacts on habitat to the extent practicable.
Objective 10:	Identify and minimize bycatch, which include regulatory discards, to the extent practicable, and to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

In June, the New England Council voted to adopt Amendment 16 to the Northeast Multispecies FMP, which is currently pending approval by NMFS. The goals of the amendment are twofold: to comply with the 2006 MSRA requirements and to rebuild fish stocks by meeting mortality objectives. To accomplish the first goal, the action outlines a process for determining Annual Catch Limits (ACLs), and adopts Accountability Measures (AMs). The ACLs are linked to the AMs and automatically adjust management measures to maintain catch below the set target levels. In effort to achieve the second goal, the Council proposed seventeen additional sectors for the commercial groundfish fishery.⁷¹

Sector Program:

Instead of simply expanding on the sector program outlined in Amendment 13, Amendment 16 is a complete rewrite of the program. Sectors, as mentioned above are self selecting and largely self regulating harvest cooperatives. Amendment 16 defines sectors as:

“...a group of persons (three or more persons, none of whom have an ownership in the other two persons in the sector) holding limited access vessel permits who have voluntarily entered into a contract and agree to certain fishing restrictions for a specified period of time, and which has been granted a TAC(s) in order to achieve objectives consistent with applicable FMP goals and objectives.”⁷²

There is no requirement for sectors to be formed on the basis of gear type, permit category, or vessel characteristics, providing a great deal of flexibility in the composition of sector members. Sectors are required to submit a variety of documents outlining their planned

operation such as formation proposals, monitoring plans and operation plans. A NEPA document must also be submitted to NMFS assessing the impacts of sector formation.⁷³

Sectors operate by managing a combined allocation, which is the pooled allocation of all sector participants. Individual allocation for fishers joining sectors is determined by the proportion of the total landings for each specific species in the groundfish complex during the time period 1996-2006 as calculated by landings history recorded in NMFS commercial dealer database. This proportion is termed the individual's Potential Sector Contribution (PSC) and is considered permanent unless modified by future council action. The pooled PSC from all members of a sector is the sector's Total Allowable Catch (TAC) proportion. When Annual Catch Levels (ACLs) are determined, the relevant TAC proportion is multiplied by the ACL to determine the sector's Annual Catch Entitlement (ACE) in weight units. Amendment 16 removes the previous 20% cap on TAC shares that can be allocated to a sector, thus, there is no limit on the amount of TAC that can be allocated to a particular sector. For the two existing sectors, Georges Bank Cod Hook Gear Sector and Georges Bank Fixed Gear Sector, the allocation catch history baseline will remain 1996-2001 as approved in Amendment 13.⁷⁴

Sectors are allocated TAC proportions for all groundfish stocks within the management unit for which they qualify with the exception of Atlantic halibut, ocean pout, northern windowpane flounder and southern windowpane flounder whose small TACs are managed by alternate restrictions such as trip limits instead of catch allocation. Sectors are required to account for all catch with quota (ACE). To help facilitate this requirement, sectors are allowed to freely exchange ACE with other sectors and may carry up to 10% of unused ACE

over to the next fishing year. Transfers of ACE are temporary, pertain to a specific fishing year, and are subject to NMFS approval. The only mechanism by which permanent transfer of sector shares can be attained is by moving permits between sectors at the beginning of a fishing year. Participants in sectors operate according to their own business plans and may decide to fish their allocation collectively to reduce overhead operating costs. In addition to the increased flexibility provided by sector management, sectors are exempt from many of the effort control measures in place for the common pool such as DAS restrictions, trip limits for species with an allocated TAC and some time-area restrictions.⁷⁵

Sectors are held to a hard TAC, meaning that they will be penalized for any catch not accounted for by their annual allocated or acquired ACE. In addition to any actions for ACE overage outlined in the sector's operation plan, the overage will be deducted pound for pound from the following year's ACE, and the sector may be charged for the overages. In the event of continual ACE overages the sector's TAC share may be permanently reduced or their operational approval withdrawn. The benefit to sectors of being held to a hard TAC is that they are assured members of their sectors will not face reductions in their TAC proportion as the result of overages by vessels outside their sector. Each sector is responsible for only its behavior. Members of sectors are joint and severally liable for adherence to the regulation: "For the purposes of enforcement, a sector is a legal entity that can be subject to NMFS enforcement action for violations of the regulations pertaining to sectors. Vessels operating within a sector are responsible for judgments against the sector."⁷⁶ Fishermen in sectors have an incentive to ensure they and their fellow sector members play by the rules.⁷⁷

Sectors are responsible for monitoring their catch in terms of both landings and discards through actions outlined in their operation plan, and to stop fishing before their ACE is exceeded. Amendment 16 outlines several requirements such as landing all legal sized fish from the management unit, reporting all landings and discards to NMFS on a weekly basis, and implementing an independent third-party weighmaster/dockside monitoring system. The monitoring program will not replace the current VTR, dealer reporting, or NMFS Observer Program coverage requirements. Dockside monitoring is required of 50% of the trips in each sector, decreasing to 20% after the first year. By fishing year 2012 sectors are required to implement an industry funded at-sea monitoring and observer program, required at a level of less than 100% of trips. An estimated discard rate will be applied to sectors until an adequate at-sea monitoring program is implemented allowing a specific discard rate to be calculated.⁷⁸

Common Pool:

Fishery participants who chose not to join a sector are still eligible to fish individually in the common pool under a reduced DAS management program. Amendment 16 reduces Category A permits by 50%, resulting in a split of 27.5% Category A and 72.5% Category B permits from each permits DAS baseline. The common pool fishery is still required to adhere to Category A trip limits, gear and time-area restrictions, and reporting requirements. A hard TAC is also adopted for the common pool beginning in 2012, implemented through an Accountability Measure (AM) system whereby fishing will cease in a stock area when it is projected that the TAC of the stock will be caught.⁷⁹

STAKEHOLDER PERCEPTIONS:

Catch share management is a very contentious topic in New England. There are a wide variety of stakeholders involved including fishermen, processors, retailers, fishing organizations, environmental groups and NGOs. The Northeast Seafood Coalition (NSC), a non-profit fishing organization that represents groundfish fishermen, businesses and communities is a significant stakeholder. They are the largest groundfish trade association in New England and have agreed to manage 13 of the sectors created through Amendment 16.⁸⁰ The Gulf of Maine Research Institute has also been active in discussions surrounding catch shares.⁸¹ While not polarized in support or opposition for groundfish sectors, GMRI has engaged with fishermen to help adapt to the changing regulations.

Several environmental groups including Oceana, Ocean Conservancy, Environmental Defense Fund (EDF) and EarthJustice have all been involved with catch share management in New England. EDF has been particularly active throughout the Amendment 16 process, strongly advocating for the adoption of sector management. They have also been actively engaged in catch shares nationally; convening a panel on catch shares during the September annual meeting of the American Fisheries Society, and in addition to the materials posted on their website have recently published a draft Catch Share Design Manual.⁸²

The perspectives of participant stakeholders, particularly fishermen and retailers are much more varied and less straightforward. These fishery participants work in a field with complicated and continually changing regulations. The adoption of the groundfish sectors

in Amendment 16 is a significant deviation from the norm of industry operations. Many fishermen made business decisions such as investing in larger boats to be more competitive under the DAS management system. In the new sector program, this higher fishing capacity does not result in a competitive advantage. Likewise, processors have made business decisions to accommodate large quantities of catch during a small time frame, which will likely be less utilized under the proposed management scheme. Hence, there is concern that groundfish sectors will leave some people at a significant disadvantage.⁸³

One of the goals of catch share management is to increase efficiency. The groundfish fleet is highly overcapitalized meaning that there is far too much fishing power or capacity for what the resource can support. Consolidation of the fleet and processors is an expected, and some argue necessary consequence of increased efficiency, however, much concern has been expressed as to the impacts that this will have on fishing communities. Allocation of quota (PSC) has also been a contentious topic. The Council voted to calculate allocation based upon historical landings which will leave some participants with very little quota. If the quota allocated is not sufficient to be profitable, those individuals will either need to exit the industry by selling their quota or purchase additional allocation on the quota market. As the number of fishery participants decreases, this may impact the structure of the groundfish fishery as a whole, changing the dynamics for processors and communities.⁸⁴

In addition to the participant stakeholders who have expressed opposition or concern over the new sector program, many have expressed strong support. Many fishermen recognize

the depleted status of the New England groundfish stocks and feel the management structure outlined in the amendment will help stocks recover and allow for a more profitable fishery in the future. The views expressed through public comment at council meetings have demonstrated that whether stakeholders support or oppose the amendment, they are passionate about their position. Fishery management in New England has long been a contentious topic, and the adoption of sectors is no exception. The NEFMC has the herculean task of balancing the ecological health of the resource with the region's economic viability. Frustrated with ineffectiveness of the DAS management scheme, the Council hopes that the groundfish sector program will be able to rebuild stocks and increase the fishery's economic performance.⁸⁵

NEW ENGLAND FISHERY MANAGEMENT COUNCIL PERSPECTIVE:

The NEFMC executive staff, in collaboration with the Fisheries Leadership and Sustainability Forum convened a workshop on catch share management for the purpose of educating the council community (council members, council staff, advisory panel, and SSC) on catch shares and providing a starting point for future dialogue about the use this management tool within the region. (Agenda, Appendix 2) While the workshop explored catch shares as a general management tool, there was much discussion about the groundfish sector program. Three main themes emerged from the sector discussions: monitoring, consolidation, and community impacts. The importance of adequate monitoring was expressed; council members discussed the high cost of monitoring to the industry, but also the consequence of not having adequate monitoring in eroding the integrity of the program. With an overcapitalized groundfish fishery, the implementation of sectors and ACLs are going to result in consolidation of the fleet. While reduction in capacity is necessary to recover stocks and maintain sustainable harvest levels, many fear the impact this will have on the fleet, crew and processing sector. The council community also expressed concern over how the sector program could negatively impact fishing communities.⁸⁶

MITIGATING CONCERNS:

MONITORING:

The success of any fishery management plan in adhering to set ACLs depends on the ability of managers to accurately monitor total mortality (both landings and discards). Catch shares are a tool that can help managers in achieving this goal by holding individuals, or in the case of sectors, entities, accountable to their allocated TAC. Robust monitoring is particularly important in catch share programs to ensure each participant stays within their quota and thus maintains the integrity of program. The functioning of the New England Groundfish sector program depends upon each sector catching only its allotted TAC. If monitoring is not sufficient to ensure that each sector is adhering to their allocation there becomes an incentive for sectors to catch more than their quota, resulting in ACL overages and subsequent reductions in overall TACs. This erodes the security of the program, undermines the expectation of future economic gains as a result of compliance, and sabotages rebuilding plans.

The 2006 MSA specifies that any catch share program must employ an effective system for monitoring and enforcement including the use of observers or electronic monitoring systems. Councils have flexibility in determining what constitutes an effective monitoring system and which combination of systems (ex: electronic monitoring, at-sea observers, dockside monitoring) would be most appropriate.⁸⁷ Understanding the challenge this poses, the NOAA Draft Catch Share Policy proposes the creation of a working group comprised of NOAA, Council, state and other experts to provide advice and guidance to

Councils in determining what level of monitoring would be sufficient for their particular program.⁸⁸

As referenced above, Amendment 16 requires sectors to outline mechanisms to adequately monitor catch and discards in their operation plans. These mechanisms require independent dockside monitoring at a rate of 50% of trips for FY 2010 and 20% in subsequent years, and at-sea monitoring or electronic monitoring beginning in FY 2012. At-sea/electronic monitoring levels will be determined by NMFS on an annual basis and will be in addition to the NMFS-funded observer coverage. Though the level of observer coverage has not been determined, the proposed rule set the requirement at less than 100% coverage. The amendment stipulates that electronic monitoring may be used in lieu of onboard observers if the technology is deemed efficient for a specific gear type and area. However, electronic monitoring has not been approved for any area or gear type in the multispecies fishery. NMFS-funded observer coverage for sectors will be approximately 38% for FY 2010. Vessels fishing in the common pool will be subject to 30% NMFS-funded observer coverage for FY 2010 and 20% dockside monitoring in 2012 once a hard-TAC is adopted. Both sector and common pool vessels are required to use a Vessel Monitoring System (VMS) for each multispecies fishing trip.⁸⁹

A major consideration in the establishment of monitoring levels is cost. The industry will be required to cover the cost of dockside and at-sea monitoring with the exception of the NMFS-funded observer program. This is projected to cost between \$13,500 and \$27,000 per vessel within a sector.⁹⁰ The expense of monitoring on sectors will be particularly significant as the fishery rebuilds and TAC proportions are low, however, monitoring is

particularly important to ensure ACE is adhered to and the fishery rebuilds to provide higher economic gains to participants. Monitoring within the context of sectors can help to reduce the per capita costs by consolidating fishing effort and thus the amount and expense of monitoring. NOAA has pledged \$16.7 million dollars to help the New England Northeast Multispecies fishery transition to sector management, including \$5.8 million to subsidize monitoring costs in FY 2010.⁹¹

Perspectives from Other Regions:

Despite the high cost of comprehensive monitoring, experts from existing catch share programs have attested to the necessity of incorporating complete observer coverage to uphold the integrity of the program.⁹² Some managers stress the importance of full monitoring particularly during the first years of operation, while others advocate for a gradual increase. The following description of the British Columbia Groundfish Individual Vessel Quota (IVQ) system provides a case study of the benefits and costs associated with monitoring a multispecies fishery.

The British Columbia Groundfish Fishery manages more than 60 different stocks of groundfish off the Pacific Coast of Canada. The fishery is currently managed under an Individual Vessel Quota (IVQ) system which was phased in between 1990 and 2006. The management unit is now integrated to include five fisheries in the management complex, which enables trading between stocks to address bycatch. The fishery has phased in a robust and effective monitoring system which has enabled the fishery to adhere to the 27 species specific TACs within the fishery.⁹³

The monitoring system involves the use of self-reported data (ex: logbooks, sales slips and hails), 100% dockside monitoring and 100% at-sea monitoring. The requirement for full dockside monitoring was phased in from 1990 to 1996 and in some cases was implemented before the particular fisheries' transition to the IVQ system. Government certified monitors are required to observe the offloading of a vessel's catch, at a cost of \$72 per hour for the trawl fishery and \$113 per hour for the hook and line and trap fishery. The required 100% at-sea monitoring was phased in between 1996 and 2006. Monitoring must be performed either by an at-sea observer for the trawl fishery or with the use of electronic monitoring for the hook and line and trap fisheries. Electronic monitoring data is audited against fishing logs and dockside monitoring to ensure compliance. At-sea monitoring costs are \$567 per day for observers and \$55 per day for electronic monitoring. The costs of the program are shared between industry and government: vessels pay for 100% of dockside monitoring and 70% of at-sea monitoring, the government pays for 30% of at-sea monitoring and 100% of maintenance and data entry into the Fishery Operating System database. Total cost of monitoring in 2007, including the government portion, ranged from 3.05% to 7.58% of the total fishery value.⁹⁴

The monitoring system in place for the BC groundfish fishery has resulted in full catch accounting, improved data collection for stock assessments, and a reduction in discards from 26% in 1997 to 13% in 2006. The IVQ program has increased economic returns for fishery participants, encouraged more selective fishing practices, and provided greater industry flexibility.⁹⁵

Discussion/Recommendations:

While there are certainly significant differences between the groundfish fishery in British Columbia and the groundfish fishery in New England, the above example demonstrates the positive outcomes of robust monitoring in managing a multispecies fishery. In a report commissioned by the Gulf of Maine Research Institute (GMRI), experts Howard McElderry and Bruce Turriss from the BC groundfish IVQ program provide recommendations on potential monitoring and reporting options for the New England sector program.⁹⁶ McElderry and Turriss recommend implementing an enhanced dockside monitoring program and a phased in implementation of at-sea monitoring using a combination of observers and electronic monitoring.⁹⁷

Instead of adopting a phased-in approach, Amendment 16 seems to be phasing out dockside monitoring by reducing the required level to 20% after the first year. Unless there is a dramatic increase in the requirement for at-sea monitoring, the sector program may be moving toward a less robust system. While the need to gradually increase monitoring is understandable from a cost and infrastructure perspective, it is important that the requirements not be so relaxed that sector members lose trust in the program. Once participants lose faith that management has created a fair playing field it could be difficult to regain compliance. Moving toward comprehensive monitoring as early as possible is necessary to assess if the program is functioning according to the specified goals.

While widespread monitoring will be expensive for the industry, not adopting a robust monitoring system may come at the expense of the entire sector program and the sustainability of the fishery. I recommend that the Council consider moving toward 100% dockside monitoring and 100% at-sea monitoring over the course of the next several years. The council could utilize the 30:70 cost split between government and industry as employed in the BC groundfish IVQ program, which would allow industry to pay incrementally for the increase from 30% to 100% coverage. NMFS should work to develop electronic monitoring system that will be acceptable for use in the fishery, perhaps utilizing the current level of observer coverage to validate new systems. Finally, the disparate management regime employed in sectors and the common pool presents a potential obstacle to achieving full catch accounting. The Council should consider strategies to increase the monitoring coverage for vessels participating in the common pool.

CONSOLIDATION:

One of the concerns often noted when moving toward catch share management is consolidation. Though consolidation is not necessarily a function of catch shares, the inability for individuals to enter the fishery without holding quota makes consolidation a greater concern. Consolidation can occur in an open access fishery when there are very low TACs, or low input controls such as DAS that hinder a fishery participant from earning enough income to stay in the fishery. In a catch share system, individuals who are allocated a very small percentage of the TAC either purchase additional quota or sell their share and exit the fishery. In fisheries such as the New England Multispecies fishery where there is far more capacity than the resource can sustain, some consolidation is actually a goal of

management. Consolidation can “right-size” a fishery to a level where the remaining participants are economically viable, and the stocks are able to sustain the resulting harvest. One of the benefits of the sector program is that sector members can consolidate their fishing operation onto fewer vessels, reducing the sector’s capitol overhead costs.

What is feared when fisheries consolidate is that a large portion of shares will be accumulated by a single entity to the point where they can influence market prices; this is referred to as an excessive share. Market power from excessive accumulation of quota shares can take two different forms: monopoly power over the sale of fish to consumers, or monopsony power in the market for quota.⁹⁸ The 2006 MSA instructs councils to ensure that no person or entity acquires excessive shares of the quota in a program:

Magnuson-Stevens Fishery Conservation and Management Act 2006 §303A (c)(5):
(D) Ensure that limited access privilege holders do not acquire an excessive share of the total limited access privileges in the program by—
(i) establishing a maximum share, expressed as a percentage of the total limited access privileges, that a limited access privilege holder is permitted to hold, acquire, or use; and
(ii) establishing any other limitations or measures necessary to prevent inequitable concentration of limited access privileges.⁹⁹

The MSA does not provide guidance on what constitutes an “excessive share”, thus, it is up to the councils to determine what ownership limits are sufficient to avoid excessive market power while achieving the other management goals of the fishery. Consolidation can be regulated by establishing excessive share caps which set an upper limit on the portion of quota that can be held by one entity.¹⁰⁰

Under Amendment 13, sector allocation was restricted to no more than 20% of the annual TAC. This restriction has been removed in Amendment 16, resulting in no ownership cap

for sectors. While sectors may lease ACE with other sectors, they may only transfer DAS permits and the associated PSC with other vessels within the same sector. Outside of the fishing year, permits and allocation may move between sectors by means of vessel owners exiting one sector and joining another, bringing with them their associated PSC. Vessels fishing in the common pool are free to transfer and trade their DAS permits. Amendment 16 removes the previous DAS leasing cap, thus there is no limit to the number of DAS permits that can be leased to a single permit holder. The amendment also eliminates the DAS conservation tax on the permanent transfer of DAS permits, therefore no reduction in DAS will result from the transaction.¹⁰¹

For consolidation to occur under Amendment 16, DAS permits and their associated fishing history (PSC) may be consolidated under a smaller number of DAS permitted vessels in the common pool, sector members may leave sectors and sell their DAS permits in the common pool, or sectors may purchase the DAS permit of sector members and increase the sector's PSC. The requirement for sector membership to consist of at least three participants provides some buffer against excessive consolidation; however, there is no requirement that all three sector members actively fish their PSC.¹⁰²

Perspectives from Other Regions:

Table 5 shows some of the accumulation limits established for existing catch share programs in the U.S. There are a number of different motivations for why councils have chosen to adopt different levels of excessive share limits. Some councils have opted not to set limits on consolidation to ensure the resource TACs are fully utilized in fisheries with a

small number of participants such as in the South Atlantic Wreckfish ITQ fishery. Other councils have adopted very small limits to help maintain the composition of the fishery, often setting the accumulation cap at the level of the highest share granted in the initial allocation, as was done in the Gulf of Mexico Red Snapper IFQ fishery.

Table 5: Accumulation Limits for Existing Catch Share Programs (Source: NOAA Fisheries Service Catch Share Program Spotlights¹⁰³)	
Wreckfish ITQ (SAFMC)	
	10% initial cap, no cap thereafter.
Alaska IFQ Halibut and Sablefish Program	
	Unless grandfathered in based on original landings history, no one can hold or control more than 0.5%-1.5% of the halibut or sablefish shares in various combinations of areas (Gulf of Alaska, Bering Sea, and Aleutians). There are similar restrictions on the amounts that can be used on any single vessel.
Bering Sea & Aleutian Islands (BSAI) American Fisheries Act (AFA) Pollock Cooperatives (NPFMC)	
	No entity (individual, corporation, or entities affiliated with each other above a minimum common ownership or control standard) can harvest more than 17.5%, or process more than 30% of the pollock directed fishery allocation.
Pacific Sablefish Permit Stacking Program (PFMC)	
	No vessel may stack (register) more than three sablefish-endorsed permits during the sablefish primary season. No individual or entity may own or hold (lease or otherwise obtain) more than three permits unless that individual or entity owned more than three permits as of 11/1/00.
Bering Sea & Aleutian Islands (BSAI) Crab (King & Tanner) Rationalization Program (NPFMC)	
	Individuals may not hold/use more than 1%-10% of shares (varies by fishery). Processors may not process more than 30% of processor shares for each fishery.
Gulf of Mexico Red Snapper IFQ (GMFMC)	
	For any single fishing year, no person shall own IFQ shares that represent more than 6.0203 percent of the total, which is the maximum percentage issued to a recipient at the time of the initial apportionment of IFQ shares.
Central Gulf of Alaska Rockfish (NPFMC)	
	No person may hold more than five percent of the catcher vessel or more than 20 percent of the catcher/processor quota. No catcher vessel cooperative may harvest more than 30 percent, and no processor may process more than 30 percent of the catcher vessel quota.
Bering Sea & Aleutian Islands (BSAI) (NPFMC) Non-Pollock Cooperatives (NPFMC)	
	No single person can collectively hold or use more than 30% of the quota share unless grandfathered in; no single vessel may catch more than 20% of the initial TAC assigned to the non-AFA trawl catcher/processor sector in a year.
Mid-Atlantic Golden Tilefish Individual Fishing Quota (IFQ) Program (MFAMC)	
	No person or entity may own, or hold an interest in, more than 45% of the tilefish IFQ total allowable landings (TAL) at any time.
Gulf of Mexico Grouper and Tilefish IFQ	
	Holdings can be no greater than a certain percentage of the total available quota for each species/group. The caps were determined by the maximum IFQ share issued to a person, corporation, or other entity at the time of initial apportionment of the IFQ shares. The caps are: Red Grouper 3.69%; Gag Grouper 2.29%; Other Shallow Water Grouper 7.05%; Deepwater Grouper 14.28%; and Tilefish 11.47%.

Discussion/Recommendations:

The management program adopted by the Council reflects their desire to reduce overcapacity and latent effort in the fishery. Given that DAS permit holders operating in the common pool have a pre-computed catch history (PSC) tied to the DAS permit, this facilitates transfers within the common pool and migration of vessels in and out of sectors. The complicated yet fluid nature of the system creates avenues for consolidation of the fishery. While reducing overcapacity is one goal of the management plan, excessive consolidation could jeopardize other outcomes the council hopes to achieve. In a fishery where stocks have low TACs for rebuilding purposes, managers may hope to reduce some capacity while retaining enough vessels and participants that the fishery could be fully utilized when stocks rebuild. If not outlined in the final rule, I recommend the council identify a limit on excessive shares within the first years of implementation to avoid drastic and undesired changes in the composition of the fishery.

COMMUNITIES:

The removal of excess capacity in a fishery can have a negative impact on fishing communities by removing fishing, processing, and industry supporting jobs. The NEFMC has noted that the loss of fishing communities is a significant concern moving forward with the sector program. The 2006 MSA in National Standard 8 instructs councils to consider fishing communities when developing and amending FMPs:

Magnuson-Stevens Fishery Conservation and Management Act 2006 §301

(a)(8):

(8) Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of

overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirements of paragraph (2), in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.¹⁰⁴

In authorizing the use of LAPs in domestic fisheries, the 2006 Act allows communities to be allocated and hold quota and authorizes the formation of regional fishing associations which may acquire quota.¹⁰⁵

The fourth goal outlined in the Northeast Multispecies FMP Amendment 16 is to “minimize, to the extent practicable, adverse impacts on fishing communities and shoreside infrastructure.”¹⁰⁶ Sectors in and of themselves do not provide community protection. The formation of sectors is not contingent upon ties to community or region. The location of sector and the ports its members fish out of is considered a private business decision intended to provide flexibility but not necessarily protect communities.¹⁰⁷ Some sectors may choose to form around a community or region; however, membership and location are not static elements of sectors and may shift over time, providing little long term community protection.

NMFS has proposed permit banks as one mechanism to mitigate adverse socio-economic impacts to fishing communities resulting from catch shares. State-operated permit banks sponsored by NOAA would be considered a sector and allowed to transfer ACE to qualifying sectors. Permit banks would be allocated ACE based upon the PSC associated with the permits owned by the bank on an annual basis just as with other sectors. The banks can transfer all or some of their ACE for groundfish stocks to a select group of sectors which are

identified in the Memorandum of Agreement between NMFS and the state operating the permit bank. Permit banks may only lease out ACE, and are not authorized to purchase ACE from functioning sectors. The Maine Department of Marine Resources is currently working on an agreement with NMFS to operate a Maine permit bank.¹⁰⁸ There is question as to the actual impact that permit banks will have on preserving fishing communities given that the banks will be operated by the state and not held by communities themselves.

Perspectives from Other Regions:

Protecting fishing communities may be the most difficult challenge to address of the three highlighted in this paper, however, there are many options that have been employed in other regions which may warrant consideration in New England. Many of these options provide community protection as a function of catch share design decisions while others are additional programs designed specifically for the purpose of protecting communities.

The Alaska Halibut and Sablefish IFQ Program was designed with fishing-dependent communities in mind and incorporated design elements to ensure the fishery remained an owner-operated fleet and not a distant corporate fleet.¹⁰⁹ The program assigned allocation based upon geographic region to ensure a broad distribution of shares, and based upon vessel size with restrictions on larger vessels fishing quota from smaller vessel categories.¹¹⁰ A number of quota shares were also blocked, meaning that they could not be divided or consolidated to ensure that small portions of quota stay within the fishery and allow for new entrants.¹¹¹ The IFQ program also includes low excessive share caps set at 0.5% for halibut, 1% for sablefish.¹¹² The allocation and transferability aspects of the

Alaska Halibut and Sablefish IFQ Program have been effective in retaining the economic viability of Alaskan fishing communities.¹¹³ In 2004 a Community Quota Entity (CQE) program was adopted in the fishery to encourage participation from small rural communities who had previously participated in the fishery.¹¹⁴ CQEs are authorized to hold and fish quota up to 50,000 pounds per species, however they must purchase the IFQ at the current market rate and then lease the quota of local residents.¹¹⁵ Despite the revolving loan system in place through the Gulf of Alaska Coastal Communities Coalition (GOAC3), the cost of purchasing quota has resulted in low participation in the CDQ program.¹¹⁶

Other examples of design elements in Alaska are the Bearing Sea & Aleutian Islands (BSAI) Pollock Cooperatives and the Bearing Sea & Aleutian Islands (BSAI) Crab Rationalization Program. Bearing Sea & Aleutian Islands (BSAI) Pollock Cooperative program is comprised of three different types of vessels: Catcher/Processors (40% of allocation), Catcher Vessels (50% of allocation) and Motherships (10% of allocation), with no transferability between vessel types. A unique aspect of the program is that catcher vessels are required to join into a cooperative agreement with their primary shoreside processor as a condition to receiving quota share. The purpose of this contingency was to protect processing plants and the communities for whom they provide employment. The cooperative agreements ensure that fish which had historically been processed on land continue to come ashore and not be diverted to at-sea processing motherships.¹¹⁷

Bearing Sea & Aleutian Islands (BSAI) Crab Rationalization Program is a very complicated system designed to balance the interests of vessel owners, processors, captains, crew, and

communities. Shares are allocated to catcher vessels, catcher processor vessels, processors, and crew.¹¹⁸ Similar to the above program, the processor quota is also facilitated by regional landing requirements whereby catcher vessels have to land their catch at ports in the region associated with their quota, and commit a certain percentage of their catch to associated processors.¹¹⁹ Two to three percent of the quota is allocated to skippers and crew; there is also a loan program in place to facilitate the purchase of quota by crew.¹²⁰ The program includes a first right of refusal clause for communities which grants them the opportunity to purchase processor shares before they are allowed to be sold outside the community.¹²¹

Perhaps the most notable and direct community program in domestic fisheries is the Alaska Community Development Quota (CDQ) program. The purpose of the program is to support economic development, alleviate poverty, and provide social benefits to residents of rural villages in western Alaska.¹²² The CDQ program was adopted by the North Pacific Fishery Management Council (NPFMC) in 1992 for the Pollock fishery and grew to include allocations for halibut, sablefish, groundfish and crab by 1995.¹²³ The 1996 reauthorization of the MSA established the Alaska CDQ as a permanent program, requiring allocations of the above species by law.¹²⁴ There are 65 communities that participate in the program, each belonging to one of six different CDQ groups who share between 7.5% and 10% of the total fishery TAC for each included species.¹²⁵ Given the industrialized nature of many of the BSAI fisheries, many communities lease their quota to large vessels as a means to generate revenue for the community.¹²⁶ The program has been successful in supporting

the participating rural communities; providing \$500 million in revenue used to build supporting infrastructure and over \$110 million in wages, education and training.¹²⁷

The Pacific Fishery Management Council (PFMC) has recently developed Amendment 20 to the Pacific Coast Groundfish FMP, which will be submitted to NMFS for approval in 2010 for implementation in the 2011 fishing year. The plan outlines a hybrid catch share program for managing the groundfish fishery. The at-sea component of the fishery, including catcher-processor and mothership vessels targeting Pacific whiting will be managed under a cooperative system, where co-ops fish a jointly held quota. The shoreside component of the fishery is comprised of multispecies groundfish trawl and whiting trawl vessels that deliver to shoreside processing facilities will be managed with an IFQ system. The Council has adopted an Adaptive Management Program (AMP) for the multispecies IFQ sector to address the following objectives: community and processor stability, conservation, facilitate new entrants, and address unintended or unforeseen consequences of IFQ management. The AMP will be allocated 10% of the total groundfish (excluding Pacific whiting) quotas to be used in programs designed to achieve economic and social goals for communities. During the first two years of the new program, the 10% AMP set-aside will be distributed to current permit holders while the Council develops a system to employ the quota to communities.¹²⁸

Discussion/Recommendations:

While the programs in Alaska are direct with their intent to protect communities and have been effective in doing so, the landscape of fisheries and communities in Alaska are very

different than in New England. There are still, however, lessons that can be learned from the Alaskan examples to help protect fishery-dependent communities by means of protecting jobs and infrastructure. I recommend that the New England Council consider through future amendments to the Northeast Multispecies FMP a program for processor allocations and regional landing requirements. One of the concerns that have been raised for the new sector program is that shoreside infrastructure will be consolidated to the point of not only jeopardizing the viability of communities but also reducing capacity to a point where there will be a shortage of ports and processors when the ACLs increase. I also encourage the council to consider the implementation of captain and crew quota to provide an avenue for new entrants into the fishery.

The Pacific Groundfish Fishery has many similarities to the New England Groundfish Fishery. Management of the Pacific Groundfish Fishery encompasses 90 different stocks; a complex, inter-related fishery on par with that in New England. The PFMC is also constrained by a number of overfished stocks, and required to end overfishing and implement ACLs and AMs.¹²⁹ I think much can be drawn from the Adaptive Management Program (AMP) approach adopted for the Pacific Groundfish Fishery to mitigate adverse consequences on communities. Unlike communities in Alaska, fishing communities in the Pacific and New England regions are somewhat cosmopolitan, and depend on the fishery for income and livelihood rather than subsistence. Commercial fishing is a way of life in these living waterfront communities.

Given that the sector program has already determined allocation without an adaptive management set-aside in place, the council would need to be creative in how to acquire

quota. A buy-back program, as has been advocated by many stakeholders, of latent or low DAS permits would both facilitate reduction in capacity and supply quota for adaptive management. Potential uses of the adaptive management set-aside could be to provide crew and captains access to quota, provide access to new entrants into the fishery, and supplement quota to fishery-dependent communities. Building off of the state-operated permit bank concept, the council could also consider allocating some of the adaptive management quota to communities in order to establish community-run permit banks.

CONCLUSION:

In summary, I recommend the council consider the adoption of the following management components to the Northeast Multispecies Fishery FMP to address three potential areas of concern with the new sector program:

- Monitoring:
 - Full Catch Accounting: 100% dockside and 100% at-sea observer coverage.
 - Develop an electronic monitoring system to augment at-sea observer coverage.
 - Cost sharing between government and industry for monitoring coverage.
 - Competitive bidding process for observers to reduce costs.
 - Increased monitoring coverage for common pool vessels.
- Consolidation:
 - Establish accumulation limits for sectors and common pool DAS permits.
- Communities:
 - Incorporate an adaptive management program.
 - Execute a buy-back program to acquire quota.
 - Allocate quota to processors in historical processing communities.
 - Establish a quota purchase program for crew, captains and new entrants.
 - Allocate quota to and establish community-run permit banks.

It is difficult to predict whether or not a management program will achieve its goals and objectives prior to implementation, however, the three concerns discussed in this paper, if not addressed, are likely to compromise the ability of the management plan to achieve its desired outcome. The above recommendations, though each addressing a specific concern, are mutually beneficial components to a robust management system. While the cost of complete monitoring will largely be borne by industry participants, full catch accounting will increase their confidence in the program and rebuild stocks to levels that support

greater catch limits and thus result in greater profits. Establishing accumulation limits will work hand in hand with community protection. The mechanisms outlined above to protect communities address the social and economic goals of the groundfish fishery in New England. Adopting an adaptive management approach will allow the Council great flexibility in responding to unanticipated consequences of sector management, economic fluctuations, and changing management priorities outside of the FMP amendment process.

The NE groundfish fishery has long been plagued by overfished stocks, declining catch limits, overcapacity, and decreasing economic returns. The NEFMC has invested several years in the careful development of a program that will balance the social, economic, and biological goals of the fishery. Sectors are a new approach that, with hard catch limits and individual accountability, has the potential to end the race to fish and rebuild groundfish stocks. The Council was very thoughtful in its consideration of alternatives, and arrived at the proposed sector program with much support from industry, NGOs and NMFS. The incorporation of these recommendations will further strengthen the New England Multispecies sector program and increase the likelihood of rebuilding New England's groundfish stocks while maintaining vibrant fishing communities.

APPENDIX:

<p>Appendix 1. Summary of specific activities proposed to support the consideration of catch share programs under the draft NOAA policy, subject to availability of funds. (Source: NOAA draft Catch Share Policy)¹³⁰</p>	
<p>1. Reduce technical and administrative impediments</p>	
1.1	Provide Councils a list of possible characteristics to evaluate catch share applicability.
1.2	Issue policy guidance on the interpretation and consistent applicability of the new limited access privilege section of the Magnuson–Stevens Act.
1.3	Create a common catch share infrastructure to minimize costs of catch share programs to taxpayers and the industry in areas such as issuing allocations and monitoring transfers, information systems to track landings, and enforcement and observer capabilities for monitoring, control and surveillance.
1.4	Develop best practices for enforcement protocols associated with catch share programs.
1.5	Create a model catch share program design process including design of public listening sessions and workshops, a catch share design handbook, and identification of reference materials and expertise.
<p>2. Providing expertise and related support</p>	
2.1	Assist in the design, transition and operation of catch share management.
2.2	It is NOAA policy to compute and recover only the incremental operating costs associated with
2.3	LAPs (not the full costs of management) to minimize any disincentive to consider catch shares.
2.4	Identify experts and assign them among Councils and NOAA regional offices in active consideration and design of a catch share program.
2.5	Complete a NOAA nationwide task-order contract for use by any Council and NMFS region to easily access outside expertise to assist in designing and executing catch share programs.
2.6	Develop business analysis and decision tools on the web for use by industry to help evaluate the relative merits of different catch share designs.
2.7	Work with fishing communities to develop community sustainability plans, and create fishing community trusts or permit banks. Promote the wider use of the NMFS Fisheries Finance program for purchase of quota shares.
<p>3. Informing and educating stakeholders</p>	
3.1	Implement a long term education and outreach strategy to help ensure the public is aware of
3.2	NOAA’s Catch Share Policy, informed of its progress, and engaged in its implementation.
3.3	Create a virtual information center/web portal to centralize catch share bibliographies, references, Frequently Asked Questions, referrals to regional expertise, case studies, news and information. Conduct an 18-month schedule of regional workshops and webinars around the

3.4	country including a focus on: 1) means to ensure sustainable communities and
3.5	employment; 2) how to evaluate options for transferability and regulate excessive
	shares; and 3) design options for initial allocation of privileges.
	Create an internal Catch Shares Center of Expertise as a coordination/consulting
	group.
	Create a speakers bureau of fishermen willing to share their catch share experiences
	with other fishermen and Councils.
4. Data, research and performance monitoring	
4.1	Establish a nationwide electronic reporting goal for all fisheries regardless of their
	current status as a catch share program.
4.2	Provide scientifically-based advice and best practices guidance to establish observer
	programs for different catch share designs.
4.3	Create a catch shares market news service.
4.4	Conduct a catch share research program.
4.5	Establish relevant performance measures for monitoring progress

AGENDA

**MOUNT WASHINGTON RESORT
310 MOUNT WASHINGTON ROAD
BRETTON WOODS, NEW HAMPSHIRE
OCTOBER 20-21, 2009**

"CATCH SHARES WORKSHOP"

The purpose of the workshop is to share information and concerns about the use of catch shares in NEFMC managed fisheries.

The main objectives are to:

- increase understanding of the science, economics, and policies related to catch shares;
- help decision makers learn from successes, failures, and challenges in other regions; and
- to place catch shares in context with what has already been approved in New England with an eye towards future direction and action.

Monday, October 19, 2009

5:00-6:00pm Registration (*Hotel Lobby; for workshop participants only*)

Tuesday, October 20, 2009

8:00-9:00am Continental breakfast (*Presidential Foyer; available to workshop participants only**)

9:00-9:30am **Welcome and Opening Remarks** (*Madison/Adams Rooms*)

- John Pappalardo, NEFMC Chair
- Purpose: Results of the Survey; Workshop Format

9:30-10:45am **Introductory Presentations**

- Chris Kellogg, NEFMC Deputy Director
- Snapshot of New England Fisheries
- Amy Schick Kenney, Duke's Nicholas Institute
- Overview of Catch Share Programs
- Q & A; Participants and Public

10:45-11:00am Break

11:00-12:30pm **Breakout 1 (#1-16); Breakout 2 (#17-33); Breakout 3 (#34-49); Breakout 4 (#50-64)**

12:30-2:00pm Lunch (*Outside Lower Veranda; available to workshop participants only**)

2:00-3:30pm **Breakout 1-4 rotation** (*continued*)

3:30-4:00pm Break

4:00-5:30pm **Breakout 1-4 rotation** (*continued*)

5:30pm **Adjourn** (*dinner on your own*)

Wednesday, October 21, 2009

7:30-8:30am Continental breakfast (*Monroe Foyer; available to workshop participants only**)

8:30-10:00am **Breakout 1-4 rotation**

10:00-10:15am Break

10:15-12:00pm **Reports from the Panel Discussions** (*Madison/Adams Rooms*)
We will share the ideas and themes that emerged from all the discussions in the breakout sessions then allow for a general discussion

12:00-1:30pm Lunch (*Outside Lower Veranda; available to workshop participants only**)

1:30-2:30pm **Guest Speaker**

- Monica Medina, Office of the Under Secretary

2:30-3:30pm **Looking Forward**

- John Pappalardo and Rip Cunningham will lead a discussion of the Council members on where to go from here

3:30-4:30pm **Participant and Public Comment Period**

4:30pm **Workshop Closing**

** Restaurant service is available in the hotel for workshop observers and the hotel has 3 restaurants to accommodate guests:*

** Mt. Washington Dining Room - jackets and reservations are required; please call 800-314-1752*

** Stickneys Restaurant - casual dining; reservations recommended; please call 800-314-1752*

** Fabyans Restaurant - casual dining; no reservations required; shuttle service available to restaurant by calling 603-278-2222*

*****A Note on the Workshop:**

At the workshop, we will have four concurrent breakout sessions. The workshop participants will be broken into small groups and rotate through each of the breakouts. Each breakout will begin with brief presentations from a panel (2-4 experts) and be followed by Q&A and discussion and each will run 90 minutes.

We have recruited a diverse group of experts who can provide insight from their own experiences, but also apply their lessons learned to the situation in New England. We have experts from the following categories: Council staff, Council members, NMFS, states, fishermen, academics, and scientists, as well as geographic diversity (both domestic and international).

Breakout 1: Pacific Groundfish

Focus: look at the development of the most recent and most complex catch share program in the United States by inviting a variety of perspectives on the same topic.

Experts/Panelists:

- Tom Ancona, PFMC Groundfish Advisory Panel Chairman, California
- Merrick Burden, Senior Analyst, PFMC
- Don Hansen, Former Groundfish AP Chair and Council Chair, PFMC
- Don McIsaac, Ph.D., Executive Director, PFMC

Breakout 2: The Many Flavors of Catch Shares

Focus: learn about the wide variety of catch share programs and unique design elements found in the United States and internationally.

Experts/Panelists:

- Joe Childers, Fisherman, Alaska
- Mark Holliday, Ph.D., NMFS, Office of Policy
- Jonathan Peacey, New Zealand
- Bruce Turriss, British Columbia

Breakout 3: Fishing Communities and Catch Shares

Focus: Design elements for supporting fishing communities.

Experts/Panelists:

- Ed Backus, Ecotrust, North Pacific Fisheries Trust
- Wes Erikson, Fisherman, British Columbia

- Steve Minor, Fisherman, Alaska

Breakout 4: Data Collection and Monitoring Programs

Focus: hear about the data collection and monitoring programs that support catch share programs in other parts of the United States and world.

Experts/Panelists:

- Jessica Gharrett, NMFS Alaska Programs

- Howard McElderry, Archipelago Marine Research, British Columbia

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