Comparative Economic Survey and Analysis of Northeast Fishery Sector 10 (South Shore, Massachusetts)

Between 2009 (Days-at-Sea) and 2010 (Sector Catch Share)

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November 2011

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Executive Summary

The Comparative Economic Survey and Analysis of Northeast Fishery Sector 10, a six month intensive effort conducted by the Massachusetts Division of Marine Fisheries in collaboration with UMass Dartmouth's School for Marine Science and Technology, has concluded that severe economic losses have occurred in Sector 10, largely due to the difficult transition to catch shares. Between 2009 and 2010, the sector's groundfish landings declined 61 percent and groundfish gross revenue declined by 52 percent. The Sector 10's total revenue loss of $1,567,000 would have been significantly higher if not for a dramatic and unsustainable shift in effort by fishermen to non-groundfish species (lobster, dogfish, skate, etc). This shift in effort to non-groundfish species does not come without costs, and is likely to have negative conservation and management implications for other fisheries, as well as potential adverse economic impacts on the revenues of other non-groundfish fishermen.

Economic impacts in Sector 10 become more severe when business performance is evaluated at the individual level and when revenues are compared with costs. Thirty percent of permit holders lost at least 80 percent of their net groundfish revenue, totaling $301,000. Fifty-two percent lost at least half of their revenue as compared to 2009, totaling $667,000.

The Massachusetts Division of Marine Fisheries also compared 2010 aggregate information for all sectors and the common pool that lost revenue versus sectors and the common pool that gained revenue based on groundfish trips alone. This comparison showed total revenue was down approximately $11 million for 12 of 17 sectors and the common pool. Although we do not have an extensive Sector 10-like analysis informed by the voluntary sharing of confidential business information to evaluate the entire fishery, it is clear that even the five sectors that had revenue gain in 2010 included many individual participants that lost groundfish revenue.

Evaluating the true impacts of this sector management program throughout the groundfish fishery is complicated because not all sectors are homogenous. We do, however, see evidence of a fisheries disaster caused by the transition to catch shares, with a disproportionate impact on small boat (30 – 50') owners, which have been hampered by their limited range and limited access to quota.

Acknowledgements

This report relies on analyses performed by the Division of Marine Fisheries (DMF) Statistics Program. Brant McAfee and Story Reed performed all analyses (see Appendix) and through their communications with Northeast Fishery Sector 10, especially Sector Manager James Reardon, acquired data and clarified assumptions used in their analyses. They also communicated with and obtained guidance from Dr. Daniel Georgianna, University of Massachusetts Dartmouth's School for Marine Science and Technology (SMAST) and Dr. Eric Thunberg, National Oceanic and Atmospheric Administration (NOAA), who are involved in collaborative analytical work between DMF and NOAA Fisheries, i.e., a break-even analysis for the multispecies fishery. DMF Fisheries Analysts, Melanie Griffin and Nichola Meserve, provided valuable assistance to review, edit, and prepare the report for distribution.

Emily Keiley, a SMAST graduate student, developed the Sector 10 Questionnaire (Comparative Economic Survey) with input from staff at the Northeast Fisheries Science Center, DMF, and members of Sector 10.

NOAA Fisheries, as part of its collaboration with DMF to improve our understanding of Northeast Multispecies Fishery Management Plan Amendment 16 economic impacts, provided technical assistance and access to federal statistics.

Appreciation is also expressed to Sector 10 fishermen for their willingness to complete the Comparative Economic Survey (CES) and to allow us to report landings and revenue as shown in our tables and referred to in the text.

Finally, DMF Director, Paul Diodati, provided oversight and guidance to conduct the study and draft the report.

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Introduction

The Massachusetts Division of Marine Fisheries (DMF), working closely with the membership and manager of Northeast Fishery Sector 10, has prepared these analyses of Sector 10 revenues and costs during the first full year of Northeast Multispecies (Groundfish) Amendment 16 implementation. The purpose of this report is to make a comparison to the previous fishing year when all costs and revenues occurred under a longstanding days-at-sea (DAS) federal fisheries management program vs. Amendment 16's first year under sector (catch share) management.

This comparison was made possible by a DMF and SMAST Comparative Economic Survey (CES). The CES was developed collaboratively with the Sector 10 manager and members in order to ensure that the questionnaire design would encourage a high level of response and that sector members would feel comfortable sharing the information. This report provides more concrete data that serves to further strengthen Massachusetts Governor Deval Patrick's request to the Secretary of Commerce in November, 2010 for a fishery disaster declaration.

Statement of Problem

A November 2010 report prepared by the Massachusetts Marine Fisheries Institute (MFI) projected serious impacts on a majority of groundfish fishermen in Massachusetts as a result of Amendment 16 (catch share) implementation. That report formed the basis of a request for a fisheries disaster declaration that Massachusetts Governor Deval Patrick forwarded to the Secretary of Commerce. The Commonwealth's request was subsequently denied based on a NOAA Fisheries evaluation that showed no notable differences in total fishery revenue between FY2009 and FY2010.

NOAA, recognizing its evaluation did not account for costs associated with the new management program or impacts caused to individuals as a result of the new allocation system, left open an opportunity for the Commonwealth to resubmit additional information to identify any fishermen and communities that may be in need of targeted assistance. As a case study, we choose to analyze the impact of the new fisheries management program on Sector 10.

Background

The New England Fishery Management Council's (NEFMC) shift to hard quotas under sector management in fishing year (FY) 2010 fundamentally altered access to and operation of the groundfish fishery. The DAS program has been in place since 1994. Groundfish quotas under Magnuson-Stevens (except for quotas established through the 2002 U.S./Canada Transboundary Resources Sharing Understanding for cod, haddock, and yellowtail flounder) were last used from 1977-1982.

The sector management program allows groups of Northeast multispecies permit holders to "pool" their individual potential sector contributions (PSCs) thereby creating Annual

Catch Entitlements (ACEs) – sector allocations of groundfish stocks. PSC allocations are based on fishermen's catch histories from an 11-year period of 1996 – 2006. Once in sectors, fishermen are allowed to retain their PSCs for their own use. Northeast multispecies permit holders who do not join a sector fish in the "common pool" under individual allocations of DAS.

With the implementation of Amendment 16, sectors may receive a transfer of additional ACE from other sectors to supplement their members' contributions, and members of the common pool may lease additional DAS from other common pool members to supplement their individual DAS allocations. Members of sectors may also lease additional DAS from other members of sectors (but not from common pool vessels) for the purpose of fishing for monkfish and/or skates.

Impending socioeconomic effects caused by Amendment 16 were not well understood or quantified before its implementation. Nevertheless, fishermen anticipating hardships of a DAS program with hard quotas, reluctantly accepted the unknown risks of Amendment 16 sector management with its allocation approach. Now, after the first full year under Amendment 16 (May 2010 – April 2011), actual impacts are not yet fully understood, in part because what information has been collected suffers from confidentiality concerns preventing disclosure of individual situations.

A NOAA Fisheries update on FY 2010 performance in the groundfish fishery (August 2011 Report) has provided some preliminary information on revenue and landings, but it did not examine costs associated with joining a sector, vessel operating costs, effects of ACE trading, and changes in ownership patterns. NOAA Fisheries released a subsequent report in October 2011 that more extensively analyzes ACE trading information and fishery performance. The report concludes that consolidation increased under catch share management thereby strengthening the Commonwealth's assertion that targeted economic assistance is needed.

Choice of Sector 10

Approximately 400 permits remain active in the Northeast groundfish fishery. Among a number of Massachusetts-based sectors adversely affected by Amendment 16, DMF considers Sector 10 (with a membership of 40 permits with 27 ownership entities) to be stressed. Its fishermen's primary ports of landing – Scituate, Marshfield, Plymouth and Provincetown – suffer because vessels in this sector are smaller and have limited range.

This sector is disadvantaged geographically because it is located adjacent to a number of federal fishing closure areas. These rolling closures were designed to reduce fishing in areas of groundfish highest catches. Consequently, small vessels fishing in-shore have reduced catch histories relative to larger vessels that were not impacted to the same degree by rolling closures (i.e., larger, multi-day trip vessels). Acquiring a limited catch history because of rolling closure areas is not unique to Sector 10 vessels. This impact was felt by many small vessels fishing from other Massachusetts ports.

Sector 10 Concerns

The sector's objection to Amendment 16 was clearly described by Sector President Edward Barrett and the Sector Board of Directors in a March 25, 2010 letter to NOAA Administrator Dr. Jane Lubchenco. Some of their concerns were: "(1) NMFS records of historic landings used to calculate individual catch shares are deeply flawed…leaving fishermen with insufficient allocation to sustain their businesses, and (2) economic pressure and uncertainty may lead to catastrophic consolidation and loss of traditional fisheries and fishing communities which have existed, literally for centuries throughout our region."

Sector Cooperation

Recognizing the severe economic impacts of catch shares they have been experiencing, Sector 10 fishermen decided to share with DMF and SMAST what otherwise would be confidential information. Sector data are considered confidential because a sector (even with three or more members) is a "person" according to NMFS' interpretation of the Magnuson-Stevens Act definition of a "person." This oddity dramatically restricts Council and state and federal fisheries managers' access to and dissemination of vital information needed to evaluate the health of sectors and the impact of Amendment 16. It impedes the manner in which this information may be publicly discussed and released. In order to help substantiate the economic loss they have experienced, however, Sector 10 fishermen have allowed a first-hand and close look into their cost and revenue information. However, some of that information cannot be presented due to confidentiality concerns.

Approach and Methodology

This analysis assesses the impacts of the first year of sector management on Sector 10 in a variety of ways. The tables describe and compare the costs and revenues for Sector 10 for fishing years 2009 and 2010. For the purposes of this comparison, only permits that were 2010 members of Sector 10 were considered. Every attempt was made to utilize the most accurate and comprehensive data available in consultation with Sector 10 leadership.

Analysis focused on revenue performance at (1) the Sector level, which assessed profitability of Sector 10 as a single entity, (2) at the permit level, which assessed each permit independently, and (3) at the ownership level. It is important to consider profitability at the ownership level because single individuals can own multiple permits, therefore their cost/revenue structures are likely different from those only owning a single permit.

Landings, effort, revenue, leasing and cost data were analyzed at the permit level to estimate net revenue performance of each permit in Sector 10. Final results of the individual permit analysis were grouped according to permit holder to define their overall economic performance.

The analysis used each permit's landings, revenue and effort information as recorded in the NMFS NERO Sector Monitoring Database. Cost data (trip and fixed) were not available for each permit, thus to account for each permit's unique cost structure, profiles according to vessel length and gear type combinations were used to estimate these costs.

Cost profiles estimated fixed and trip costs for each permit. They were then deducted from overall revenue to arrive at a net revenue estimate for each permit. Also included in this analysis were: DAS and ACE leasing costs and revenues; marketing costs; and sector administration costs.

Estimating Loss of Groundfish Revenue for all Sectors and Common Pool

In addition to the in-depth Sector 10 Analysis, a comparison of the change in groundfish net revenue between 2009 and 2010 was done for all of the Massachusetts' based 17 individual sectors, including the common pool (treated as a single entity). This analysis was not constrained to the state of Massachusetts due to some sector membership and landings spanning multiple states.

The groundfish net revenue comparison accounted for estimated 2009 and 2010 DAS/ACE leasing revenues/costs for each sector (and common pool). Groundfish gross revenues for each sector and the common pool were adjusted according to their net leasing position in 2009 and 2010 (annual revenue gain or loss due to leasing).

The difference between 2009 and 2010 groundfish net revenue for each sector and the common pool was calculated to identify sectors that lost or gained groundfish net revenue. Losses for all sectors (and common pool) that lost revenue in 2010 were summed to estimate the magnitude of combined losses. Conversely, the gains for all sectors that gained revenue in 2010 were summed to estimate the magnitude of combined gains.

Refer to Appendix I for a full description of the data and methods used.

Results

Landings and Revenues

Sector 10 aggregate groundfish landings declined 61 percent from 2,026,900 lbs. in fishing year 2009 (DAS management) to 784,300 lbs. in 2010. Groundfish *gross* revenue decreased 52 percent from $2,996,800 to $1,430,000 [Table 1].

Net revenue from groundfish trips (including both groundfish and non-groundfish caught of those groundfish trips) also declined 52 percent (from $1,243,000 to $596,000) [Tables 1 and 2]. Decrease in groundfish revenue appeared consistent with a 62 percent decrease in groundfish trips from 1,861 trips in 2009 to 714 trips in 2010 [Table 3].

When non-groundfish from all trips is included in Sector 10 landings and value, the importance of other species to Sector 10 becomes obvious. Non-groundfish pounds rose slightly from 1,637,500 lbs. (2009) to 1,770,900 lbs. (2010) [Table 1], yet they comprised 54 percent of total landings in 2009 and jumped to 70 percent of total landings in 2010.

Net revenue for all trips (groundfish and non-groundfish) decreased from $1,509,500 in 2009 to $1,104,700 in 2010 (includes all revenues, trip costs, lease costs, and fixed costs). This was a decrease of $404,800 (27 percent). Non-groundfish trips increased by 43 percent (754 to 1,076 trips) [Table 3] which contributed to a non-groundfish gross revenue increase of 22 percent resulting from the Sector's non-groundfish landings in 2010 (1,770,900 lbs.). Non-groundfish landings and revenue increases were primarily from catches of spiny dogfish with smaller yet substantial amounts of summer flounder, *Loligo* squid, whelk, and lobster.

ACE Leasing

Groundfish quota moved both in and out of Sector 10 during FY 2010 through leasing. The sector leased 297,967 lbs. *to* other sectors, and leased 332,736 lbs. *from* other sectors, for a net balance of 34,769 lbs. leased in. Sector 10's net revenue gain from leasing was less than $3,000.

A significant portion of Sector 10 ACE was neither landed nor leased out. The 1,098,637 lbs. not used was worth $1,235,600 in landed value (based on prices Sector 10 members received for their fish in FY 2010) or $269,100 in leased value. Most of the unused ACE was pollock (471,000 lbs.), Western Georges Bank haddock (158,400 lbs.), Eastern Georges Bank haddock (74,700 lbs.), plaice (85,200 lbs.), redfish (85,300 lbs.), and Gulf of Maine cod (108,800 lbs.).

Various factors, such as seasonal availability of species, weather conditions, mid-year adjustments to ACLs, "choke" species, and the first-year learning curve for sector management and operation, likely contributed to the sector's under-performance in using its ACE. Additionally, some sector members who initially were predisposed to continue their fishing businesses, lacked proper understanding of how NOAA would apply bycatch discards to ACE balances and were uncertain about sector rules, causing them to delay trading (or fishing) activity until it was too late in the season for transactions to be carried out.

Crew

Sector 10 experienced a 22 percent decrease in crew members employed from 28 crew member in 2009 compared to 22 in 2010. Total crew pay decreased from $738,200 to $495,700, representing a 33 percent decrease. Mean pay decreased from $26,365 to $22,530 [Table 4].

Individual Economic Performance [1]

Of all the permit holders (single and multiple permits), 21 out of 27 were above break-even in 2009 and 2010 [Table 5]. This was due to reliance on non-groundfish species in both years (pre- and post-Amendment 16 implementation). However, over 70 percent of these permit holders still saw a decline in *net* revenue (groundfish and non-groundfish) from 2009 to 2010. In some cases net revenue from groundfish trips alone declined dramatically:

- 5 permit holders lost 90% or more;
- 5 permit holders lost 70 – 90%; and
- 4 permit holders lost 50 – 70%.

Thirty percent (30%) of permit holders experienced an 80% reduction in net groundfish revenue equal to $301,000 (31% of total revenue). Thirty-seven percent (37%) of permit holders experienced a 70% reduction in net groundfish revenue equal to $519,000 (42% of total revenue). Forty-four percent (44%) of permit holders experienced a 60% reduction in net groundfish revenue equal to $592,000 (48% of total revenue). Fifty-two percent (52%) of permit holders experienced a 50% reduction in net groundfish revenue equal to $667,000 (54% of total revenue).

Permit holders below the Massachusetts per capita income increased from 59% in 2009 to 81% in 2010 [Table 5].

Estimating Loss of Groundfish Revenue for all Sectors and Common Pool

All 17 sectors and the common pool were examined to determine gains and losses in groundfish revenue between 2009 and 2010 [Table 6]. Aggregate losses of groundfish revenue total $10,888,000 for 12 sectors and the common pool [Table 7]. The remaining five sectors showed a revenue gain of $9,066,000.

Conclusions

We conclude this report demonstrates that severe adverse impacts have occurred to segments of the Massachusetts groundfish fishery due to the implementation of Amendment 16. Our in-depth analysis of Sector 10 clearly shows the significant loss of groundfish catch and revenues under Amendment 16. Our conclusions are supported by additional NOAA data and the Sector 10 Annual Report provided to NMFS.

Sector 10 landings and *gross* revenues for all fish on groundfish trips showed a precipitous decline. Groundfish landings dropped from 2,026,900 pounds in fishing year 2009 (DAS management) to 784,300 pounds in 2010 (61 percent decrease). *Net* revenue loss for groundfish trips was 52 percent ($1,243,000 down to $596,000). A 52 percent drop in net groundfish revenue for the Sector overall is significant, but drops in net groundfish revenue for individual groups of fishermen within the Sector go even deeper.

[1] Data to support individual economic performance is confidential and cannot be tabulated in this report.

Approximately one third of Sector 10 permit holders experienced a drop in net groundfish revenue of 80 percent these losses totaled about $301,000, equal to 31 percent of the Sector's total net groundfish revenue. Fifty-two percent (52%) of permit holders experienced a 50 percent reduction in net groundfish revenue equal to $667,000 (54 percent of total revenue). Sector 10's revenue losses in 2010 are additionally supported by the number of its permit holders below the Massachusetts per capita average income that increased from 59 percent in 2009 to 81 percent in 2010 [Table 5].

Sector 10 attempted to offset loss in groundfish revenue by increasing its reliance on non-groundfish in FY 2010. Non-groundfish landings increased from 1,637,500 lbs. to 1,770,900 lbs., and revenue increased by about $400,000 (from $1,814,800 to $2,207,000). Notably, in 2009 non-groundfish comprised 54 percent of total landings. In 2010 it jumped to 70 percent of total landings. Non-groundfish trips increased by 43 percent (754 to 1,076 trips) from 2009 to 2010 and groundfish trips decreased 62 percent from 1,861 trips in 2009 to 714 in 2010. Despite the 43 percent increase in non-groundfish trips, net revenue for all trips (groundfish and non-groundfish) decreased from 2009 to 2010 by 26 percent.

We believe fishermen attempted to compensate for the NEFMC's decision not to use recent years of catch history and exclude factors other than catch history in allocating groundfish. Redirection to non-groundfish species enabled the majority of Sector 10 permit holders to be above break even in 2010, but masked a dramatic loss of revenue from groundfish. Non-groundfish landings and revenue increases were primarily from catches of spiny dogfish with smaller yet substantial amounts of summer flounder, *Loligo* squid, whelk, and lobster.

Redirection of fishing effort into non-groundfish fisheries likely will have serious implications for fishing mortality increases that require further evaluation by the NEFMC, Mid-Atlantic Fishery Management Council (MAFMC), and the Atlantic States Marine Fisheries Commission (ASMFC). Further evaluation of effort shifts into other fisheries is particularly important for the NEFMC since the Council has established a Sector Policy regarding mortality controls aimed at minimizing the potential for mortality increases in non-sector fisheries.

Both the MAFMC and ASMFC should consider these effort shifts as possible detriments to achieving the desired conservation benefits from their previously established management programs. Expanded effort into non-groundfish fisheries also will have unintended consequences for non-sector participants who have traditionally fished in those fisheries.

There was no significant gain in Sector 10's net revenue from inter-sector ACE leasing this year. It's not clear why ACE leasing did not have more widespread benefits, but it's likely that some unfamiliar elements about Amendment 16 administrative procedures and newly developing sector management practices hampered the timing of transactions and fishermen's decisions about fishing.

This report found that negative impacts were not limited strictly to permit holders. The number of crew members employed by Sector 10 permit holders declined by 22 percent. Sector 10 average crew income also decreased slightly, in contrast to a widely held belief that catch shares result in fewer crew jobs but with higher pay. This finding substantiates claims that Amendment 16 has had an adverse impact on crew.

Although a detailed analysis of the economic consequences of Sector 10 having to assume at-sea monitoring costs beginning in 2012 (May 1) was not done, some simple calculations are instructive. Assuming the same effort levels in FY 2010, we estimated the Sector's costs will be about $153,090 in 2012 (based on industry responsibility for 30% observer coverage). If increased observer coverage eventually is required to provide greater accountability for the groundfish fleet now having few restrictions, the sector's cost would rise. We conclude that Sector 10's current earnings cannot support monitoring costs.

This Sector 10 analysis was performed to estimate the impacts of Amendment 16 on this sector. Assuredly, similar negative impacts exist elsewhere and possibly are widespread. Presumably, many fishermen throughout the Commonwealth, similar to those in Sector 10, bought permits that became virtually worthless under sector management (little catch history, but plenty of DAS) and experienced a difficult first year adjusting their business plans. While impacts across sectors and permit holders are not homogenous, we believe this analysis can be used to estimate negative impacts from catch share management across the Massachusetts multispecies fishery.

Our analysis of lost groundfish revenue in 2010 for 12 sectors and the common pool is nearly $11 million. The remaining five sectors gained about $9 million in 2010; we conclude, however, that some individual participants (ownership entities) within these five sectors also lost groundfish revenue.

Tables

Table 1. Aggregate Sector 10 Gross Landings and Revenue Performance

	2009	2010	FY09 - FY10 Difference	FY09 - FY10 % Change
Total Permits	40	40	0	0%
Active Permits	31	25	6	-19%
Total Permit Holders	27	27	0	0%
Active Permit Holders	25	24	1	-4%
NEFS 10 Groundfish Pounds	2,026,901	784,339	-1,242,562	-61%
NEFS 10 Non-Groundfish Pounds	1,637,479	1,770,928	133,449	8%
NEFS 10 Total Pounds	3,560,339	2,529,328	-1,031,011	-29%
NEFS 10 Groundfish Revenue	$2,996,761	$1,430,026	-1,566,735	-52%
NEFS 10 Non-Groundfish Revenue	$1,814,833	$2,207,061	392,228	22%
NEFS 10 Total Revenue	$4,811,594	$3,637,087	-1,174,507	-24%

Source: DMF/SMAST/NMFS Break Even Analysis

[1]All pounds are landed (dressed) pounds, NOT live pounds

[2]Only Includes landed lbs. and gross revenue from landings, excludes all expenses

Table 2. Sector 10 Estimated Net Revenue Performance

	2009	2010	FY09 - FY10 Difference	FY09 - FY10 % Change
All Trips[1] (Groundfish and Non-Groundfish)	$1,509,496	$1,104,678	-$404,818	-27%
Groundfish Trips[2]	$1,242,950	$595,994	-$646,955	-52%

Source: DMF/SMAST/NMFS Break Even Analysis & NEFS 10

[1]Evaluates entire business performance, including all revenues, trip costs, lease costs and fixed costs.

[2]Only evaluates revenues and costs associated with Groundfish trips, prorates fixed costs according to proportion of overall revenue from Groundfish

Table 3. Sector 10 Trip Effort (all trips)

	2009	2010
Groundfish Trips	1,861	714
Non-Groundfish Trips	754	1,076
Total Trips	*2,615*	*1,790*

Source: DMF/SMAST/NMFS Break Even Analysis

[1]Evaluates all trips

Table 4. Sector 10 Crew Employment (all trips)

	2009	2010
Total Crew	28	22
Estimated Total Crew Pay	$738,222	$495,670
Mean Crew Pay	$26,365	$22,530

Source: and DMF/SMAST/NMFS Break Even Analysis

[1]Evaluates all trips

[2]Crew equal to sum of median crew members (minus captain) each active permit reported on VTRs for all trips

[3]Crew pay based on 18% crew share of revenue after all trip and leasing costs

Table 5. Sector 10 Total Net Revenue (all trips) by Permit Holder

	2009	2010
Total Permit Holders	27	27
Permit Holders Above Break Even	21	21
Permit Holders Above MA Per Capita Income	11	5
Permit Holders Median Income	$44,681	$27,386
Permit Holders Mean Income	$55,066	$40,072

Source: US Census & US Bureau of Economic Analysis and DMF/SMAST/NMFS Break Even Analysis

[1]2009 MA Per Capita Income: $49,816

[2]2010 MA Per Capita Income: $51,302

[3]Due to unidentified ACE leasing revenues in 2010 of $22,726, individual net revenue analysis omits this income

Table 6. List of 2010 Sectors/Common Pool Included in Analysis

Common Pool
Georges Bank Fixed Gear Sector
Northeast Coastal Communities Sector
Northeast Fishery Sector 2
Northeast Fishery Sector 3
Northeast Fishery Sector 4
Northeast Fishery Sector 5
Northeast Fishery Sector 6
Northeast Fishery Sector 7
Northeast Fishery Sector 8
Northeast Fishery Sector 9
Northeast Fishery Sector 10
Northeast Fishery Sector 11
Northeast Fishery Sector 12
Northeast Fishery Sector 13
Port Clyde Community Groundfish Sector
Sustainable Harvest Sector 1
Tri-State Sector

Table 7. Sector/Common Pool Groundfish Revenue Differences, FY2009 - FY2010

	Loss/Gain	Count
Total Loss from Sectors/Common Pool who Lost Revenue	-$10,888,123	13
Total Gain from Sectors who Gained Revenue	$9,066,059	5
Aggregate Sector/Common Pool Revenue Difference, FY09-10	-$1,822,063	18

SOURCE: NMFS NERO "Plan B" Database, NMFS DAS Leasing Database, NMFS ACE Leasing Database

[1]Revenue from Groundfish Species ONLY

[2]Includes Common Pool and Sector Permits from all states

[3]Accounts for DAS/ACE Leasing Revenue/Costs

Appendix I

I. Data Sources

The Sector 10 analysis required integrating data across an array of sources. The majority of these data were available from existing federal fisheries data collection programs, while others needed to be collected directly from Sector 10. Without exceptional cooperation and data sharing from both the National Marine Fisheries Service (NMFS) and Sector 10 this analysis would not have been possible. The Sector 10 analysis incorporated data from the following sources:

- **MADMF/MFI Comparative Economic Survey (CES)**
- **Sector 10 Sector Manager Annual Report**
- **DMF/SMAST/NMFS Break Even Analysis Dataset (BEA)**
  - NMFS NERO Sector Monitoring Database
  - Northeast Fisheries Observer Program (NEFOP)
- **NMFS Days-at-Sea (DAS) Leasing Database**
- **Personal Correspondence:**
  - Jim Reardon, Sector 10 Sector Manager
  - Meeting with Sector 10 Board of Directors
- **SAFIS Dealer Reports**

Comparative Economic Survey (CES):
In order to fill gaps in existing data required to assess the economic health of Sector 10, the Massachusetts Division of Marine Fisheries (*MarineFisheries*) and the University of Massachusetts School for Marine Science and Technology (SMAST) conducted a Comparative Economic Survey (CES) for fishing years 2009 and 2010. Sector 10's Sector Manager distributed surveys to all members of Sector 10, who filled them out and returned them to DMF staff for data entry and analysis. These surveys aided understanding of Sector 10's costs and revenues in the 2009 and 2010 fishing years. Specifically, these data increased the precision of fixed and trip cost estimates for each permit. They also provided invaluable qualitative information describing the unique position of each Sector 10 member.

Sector 10 Annual Report Data Provided by Sector Manager:
The sector manager, Jim Reardon, provided data from the sector's year-end report. Data used from this report included inter-sector trades, intra-sector trades, and calculated ACE harvested by species stock. These data were crucial for estimating ACE leasing costs and revenues borne by individual permit holders because they described intra-sector trades between Sector 10 members in addition to inter-sector trades Sector 10 made with other Sectors. These data facilitated the construction of estimated annual net leasing positions per permit. The difference in value between ACE leased out and ACE leased in by permit holders determined their overall net leasing position. Without these data, a comprehensive review of leasing for Sector 10 would not have been possible.

Sector 10 (Board of Directors):
Due to the collaborative nature of this analysis, DMF consulted Sector 10 board members on numerous occasions to verify analytical methods. Specifically, Sector 10 board members provided all ACE leasing price data used for ACE leasing calculations, verified fixed and trip cost estimates, verified estimated DAS leasing costs, and specified the appropriate crew lay system.

Effort, Landings and Revenue Base Data
The Sector 10 analysis used data generated from DMF/SMAST/NMFS's Break Even Analysis (BEA) to determine baseline landings, revenue and effort data for each active permit in Sector 10. These data were generated from the NMFS NERO Sector Monitoring Database which was also the source for the "Report for Fishing Year 2010 on the Performance of the Northeast Multispecies (Groundfish) Fishery (May 2010 – April 2011)". In contrast to the BEA, this analysis included all Sector 10 permits regardless of their gear type, groundfish landings, and/or permit transfers. The data included each Sector 10 permit holder's FY2009 and FY2010 landings and revenue separated by trip type (groundfish or non-groundfish). Effort data included their number of trips taken by trip type (groundfish and non-groundfish) and the number of days absent.

All vessels listed in Sector 10's FY2010 Operating Plan Roster were included in the analysis, including inactive vessels. Inactive vessels received zero values for all effort, landings and revenue fields in the base dataset. The majority of these vessels were either skiffs (<20 ft) or had been inactive for longer than five years. It is important to include these permits in the overall analysis because they can still have costs associated with them via ongoing maintenance of an inactive vessel or conversely they can potentially produce revenue by leasing either DAS or ACE.

II. Methodology

Vessel Categories
The lack of individual fixed and trip cost data specific to each permit required assigning each permit to a vessel category. Assigning each permit into a vessel category facilitated the application of fixed and trip costs, which were organized into profiles specific to each vessel category. These vessel categories were pivotal for estimating costs for both active and inactive permits. The BEA defined these categories according to primary gear type each permit used to land groundfish and the length of the vessel.

Sector 10 vessel categories:

- Gillnet vessels less than 40 ft.
- Gillnet vessels greater than or equal to 40 ft.
- Longline vessels less than 40 ft.
- Otter trawlers less than 50 ft.
- Otter trawlers between 50 and 65 ft.

Some Sector 10 vessels did not fit perfectly into the above categories due to their reported gear types. DMF staff assigned these vessels to the categories above by

consulting the gear types they reported using on both their VTR reports and the CES. All situations were resolved by applying this method. Generally, most of these vessels were lobster vessels who had cost structures similar to the Longline < 40 ft. category.

Cost Estimates
Costs were broken into four primary categories: (1) trip costs, (2) fixed costs, (3) sector costs, and (4) marketing costs. Trip costs include all costs associated with fishing operations; fixed costs include all overhead expenses; and sector costs include all sector administrative costs. DAS and ACE leasing were treated differently because they represent potential cost or revenue; leasing costs and revenues are further explained later in the report.

Trip Costs
Trip costs were estimated by pairing each permit's effort statistics with a trip cost profile. The BEA developed these cost profiles from NEFOP data collected during observer deployments. Profiles were developed for FY2009 and FY2010 for each vessel category described above. These cost profiles estimated the total cost of either day trip or multi-day trips depending upon the mode of fishing. They estimated the cost of ice, fuel, bait, food, and miscellaneous supplies incurred during an average fishing-day for each vessel category. Thus, the final trip cost estimate for each permit was dependent upon its gear and vessel length combination, the number of trips made, trip duration, and number of crew.

Fixed Costs
DMF staff used CES data to generate fixed cost profiles according to each vessel category. Sector 10 membership expressed distrust of global fixed cost data used in the larger BEA because they felt the data were inaccurate. Thus, the decision was made to use CES fixed cost data wherever possible. The sample size for the CES fixed costs was much smaller than the global estimates made used in the BEA. However, after reviewing the CES fixed cost estimates, Sector 10 board members felt the CES fixed costs were more reflective of their situation. Due to the low sample size of the CES, certain vessel categories' fixed costs needed to be estimated. Linear regression of the global fixed costs used in the BEA provided these estimates. This approximated the rate of change of fixed costs between vessel sizes within the same gear category. These rates were then applied to known CES fixed costs to estimate fixed costs for vessel categories not represented in the CES. Fixed costs were also applied to inactive permits whose vessel length were greater than 20 ft and were commercially active between 2006 and 2010. However, since these inactive vessels likely incurred fewer fixed expenses than active vessels, fixed cost estimates for these vessels were reduced by 15%.

Fixed costs included: improvements and investments; haul out costs; repair and maintenance; moorage and docking fees; professional fees; non-crew labor; association fees (minus Sector fees); communication; business travel; business vehicle; hull and vessel insurance; interest payments on business loans; permit and licensing fees; business taxes; and safety equipment.

Sector Costs
DMF staff estimated sector costs by using information supplied in the CES and from correspondence with Sector 10 board members. Consensus was reached on a fixed $2500.00 fee for each active sector member (those with landings in FY2010) and a $0.04 surcharge on all landed pounds of groundfish or ACE leased out of Sector 10. All costs except for the $0.04/landed groundfish lbs. surcharge were borne solely by the permit holder and not shared by the crew.

Marketing Costs
Marketing costs include trucking and/or auction fees associated with the transportation and sale of fish/shellfish (all species). The CES and Sector 10 board members supplied auction fee data, with a consensus on applying a $0.04/lbs. charge to all landed pounds (groundfish and non-groundfish species).

Trucking costs were more variable depending upon the location of landings. Generally, landings outside of major ports had to be trucked to dealers in major ports. The CES and Sector 10 board members indicated a $0.10/lbs. charge on all trucked species. No clear, quantitative method could be determined from the CES or Sector 10 board member consultation on how to apply trucking costs. Thus, each permit's landings were separated by port of landing and a $0.10/lbs. charge was applied to all landings occurring outside of Boston, Chatham, Gloucester, Nantucket, Point Judith, and/or Provincetown.

DAS and ACE Leasing
DAS and ACE leasing were treated similarly in this analysis because both represent either potential revenue or costs depending if they are leased in or leased out by the permit. When leased in, these leasing costs were both considered a cost of fishing and were treated as such with regards to proportions of the expense paid by crew and permit owners. When leased out, these leasing revenues were considered direct revenue for each permit owner. Thus, if a permit were a net lessee, this cost would be distributed between the owner and the crew according to that permit's lay system. If a permit was a net lessor, all revenues go directly to the permit owner with none distributed to the crew.

DMF staff estimated net DAS leasing value by querying the total DAS leased in and DAS leased out by permit. The average cost per DAS leased in and leased out was provided in the CES. This provided an estimated value for DAS leased in and DAS leased out. The net of these values provided the final estimated DAS leasing position for each permit.

DMF staff estimated net ACE leasing value by apportioning the amount of ACE (pounds) by species stock that each permit leased in and leased out. The average price paid for each unit of ACE by species stock in Sector 10 was multiplied by the amount of ACE each permit leased in or leased out to estimate a value for each transaction type (leased in or out). The net of these values was used to estimate the final ACE leasing position of each permit. Currently, no standard data collection infrastructure exists for permit level ACE transaction data, thus these data were obtained from the Sector 10 Manager.

Analysis at the permit level presumes that each transaction of ACE or DAS incurred a cost or revenue, and that no ACE or DAS were freely traded (no charge). This method is not perfect and likely does not capture the true net positions of individuals who traded ACE/DAS for no charge between permits that they own. Grouping permits by permit holder should minimize this effect assuming that individuals traded DAS/ACE between their permits free of charge. By grouping the permits at the ownership level, leasing costs from certain permits are offset by revenues from other permits within the permit holder. Unfortunately, these dynamics must be assumed due to the structure of the leasing data and the lack of specific values for each transaction.

Crew Lay System

Sector 10 is composed primarily of owner-operator fishing businesses and therefore utilizes a fundamentally different crew lay system than larger fishing businesses that employ both captain and crew. After consultation with the CES and Sector 10 board members, an average crew share of 18% per employed crew member was established. This value was multiplied by the median number of employed crew (total crew – captain) per permit to estimate the total proportion of trip revenue and costs to apply to the permit owner and the crew. All trip costs were assumed to "come off the top", and the crew received their crew share of vessel revenue after trip costs. In addition to sharing all operational costs of fishing, crew members were responsible for sharing: DAS/ACE leasing, auction, trucking, and variable sector administration expenses.