Northeast Fisheries Science Center Reference Document 18-13

2015 Final Report on the Performance of the Northeast Multispecies (Groundfish) Fishery (May 2007 – April 2016)

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by Tammy Murphy[1], Gregory Ardini[1], Maria Vasta[2], Andrew Kitts[1], Chad Demarest[1], John Walden[1], and Daniel Caless[3]

[1]NOAA Fisheries, Northeast Fisheries Science Center,
166 Water Street, Woods Hole, MA 02543

[2]Integrated Statistics, Inc
16 Sumner Street, Woods Hole, MA 02543

[3]NOAA Fisheries, Greater Atlantic Region Fisheries Office,
55 Great Republic Drive, Gloucester, MA 01930

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EXECUTIVE SUMMARY

This report evaluates the economic and social performance of active limited access Northeast multispecies (groundfish) vessels for fishing years 2007-2015 (May 01, 2007 through April 30, 2016). Table 1 contains a summary of major trends in the fishery over the 2007-2015 period. All monetary metrics are reported in constant dollars using 2010 as the base year; nominal dollar values have been adjusted for inflation.

During 2007-2015, groundfish revenue decreased by $40.0 million (-43.9%), from $91.2 million in 2007 to $51.2 million in 2015, its lowest value during the nine-year period. Vessels enrolled in sectors comprised 97.7% of total groundfish revenue in 2015. Sector groundfish revenue generally declined from 2010, and 2015 sector groundfish revenue ($50.0 million) was lower than any year from 2010-2014. Common pool groundfish revenue in 2015 ($1.2 million) was at its highest value since its 2010 peak ($2.1 million), but common pool groundfish revenue only accounts for a small percentage of total groundfish revenue (2.3% in 2015). The decline in groundfish revenue over time is due to both decreased landings and lower aggregate prices. Groundfish landings in 2015 (41.6 million lbs.) were at their lowest level over the 2007-2015 period. The average price of groundfish aggregated over all groundfish species either decreased or remained the same every year from 2010-2015. The 2015 average price for groundfish species, $1.23/lb., marks the lowest average price since 2009 and the second lowest over the 2007-2015 period.

All species revenue in 2015 for the limited access groundfish fleet ($269.5 million) was lower than it was during 2007-2012, but the highest it has been since its 2012 value ($294.7 million). The increase in all species revenue from its nine-year low in 2014 ($257.6 million) was driven by an increase in non-groundfish revenue. Non-groundfish revenue in 2015 ($218.4 million) was at its third-highest value over the 2007-2015 period. Due to the declining trend in groundfish revenue and relatively more stability for non-groundfish revenue, the limited access groundfish fleet has generally become less reliant on groundfish revenue over time. In 2009, 31.4% of total revenue was from groundfish, a nine-year high. By 2015, this percentage fell to a nine-year low of 19.0%. Along with less reliance on groundfish revenue over time, the percentage of groundfish revenue derived from cod decreased sharply over time. The share of groundfish revenue generated from cod was >30% annually during 2007-2011 but decreased every year from 2012-2015, reaching a nine-year low of 12.4% in 2015.

The size of the active limited access groundfish fleet declined steadily from 2007 to 2015. Groundfish limited access eligibilities fell overall from 2007 to 2015 by 337 eligibilities (-19.9%). These eligibilities may be tied to a specific vessel or held in Confirmation of Permit History. Confirmation of Permit History provides a temporary holding place for inactive groundfish permits that allows the owner of the permit to retain the permit's fishing history without having to maintain a fishing vessel to attach the permit to. As of 2010, owners of permits held in Confirmation of Permit History that belong to sectors can lease the quota for allocated groundfish stocks associated with that permit to other sector members or to other sectors. Groundfish permit owners that belong to sectors can also transfer quota for allocated groundfish stocks between all the groundfish permits they own through leasing, including the permits held in Confirmation of Permit History. This allows groundfish permit holders to consolidate operations onto fewer vessels or to choose to lease out their unused groundfish quota to active fishermen. This flexibility has contributed to the trends observed from 2007-2015 in the number of permits held in Confirmation of Permit History and the number of active vessels. While the

total number of vessels (both active and inactive vessels) with a limited access groundfish permit has fallen over 2007-2015 by 528 vessels overall (-34.8%), the number of groundfish limited access eligibilities held in Confirmation of Permit History rose to a high of 369 eligibilities in 2015, a 392% increase from the 75 eligibilities held in Confirmation of Permit History in 2007. Both the number of active vessels and the number of active vessels with allocated groundfish landings from at least one groundfish trip fell to nine-year lows in 2015. The total number of active vessels in the limited access groundfish fleet declined by 361 vessels from 2007 to 2015, hitting a low of 678 vessels in 2015 for a 34.7% decline overall. The number of active vessels with allocated groundfish landings from at least one groundfish trip declined more sharply during this period, dropping to a low of 269 vessels in 2015, 327 vessels fewer than in 2007 (-54.9%).

Fishing effort also decreased overall through the 2007 – 2015 period. In 2015, limited access groundfish vessels across all size classes took 8,453 groundfish trips, 18,867 fewer than they took in 2007 (-69.1%). Additionally, vessels in the groundfish fleet spent 13,322 fewer days absent on groundfish trips in 2015 than they did in 2007, falling to a low of 15,144 days absent on groundfish trips in 2015 (-46.8%). As the number of groundfish trips declined more than the number of days absent on groundfish trips during this nine-year period, the average length of groundfish trips taken by the fleet grew longer, increasing annually since 2011 and peaking in 2015 at 1.79 days absent. Effort on non-groundfish trips also declined during this period, though not as sharply as effort on groundfish trips. The number of non-groundfish trips taken and days absent on non-groundfish trips both declined from 2007 to 2015, by 18.8% and 11.3%, respectively. Average trip length of non-groundfish trips varied slightly throughout the nine-year period, resulting in a modest overall increase (+2.2%) from 2007 to 2015. Average trip length for non-groundfish trips in 2015 was 0.93 days absent, the highest value for the nine-year time series.

The number of active vessel affiliations (the number of networks of vessels connected through one or more common owners) that hold at least one limited access groundfish permit declined each year between 2007 and 2015 for an overall decrease of 361 vessel affiliations (-34.7%). The number of active affiliations with revenue from at least one groundfish trip declined more sharply than the overall number of active vessel affiliations, dropping from 485 vessel affiliations in 2007 to 240 affiliations in 2015 (-245 vessel affiliations; -50.5%). Both all species and groundfish revenues were unequally distributed among vessels and vessel affiliations during 2007 – 2015, with groundfish revenue less equally distributed than non-groundfish revenue. Both all species and groundfish revenues are less equally distributed among vessel affiliations than among vessels. When measuring concentration of groundfish revenue among active vessel affiliations using the Gini coefficient, significant changes occurred more or less in three year increments. Although groundfish revenue was unevenly distributed in 2007-2009, the distribution of groundfish revenue became more unequal in 2010-2012 and 2013-2015.

Over the 2010-2015 period, the number of Moratorium Right Identifiers and vessel affiliations leasing in quota for allocated groundfish stocks has generally decreased, but the total volume (total live pounds) of quota for allocated groundfish stocks leased in has grown. The number of Moratorium Right Identifiers leasing in quota for allocated groundfish stocks decreased every year from 2010-2015, while total live pounds leased in by Moratorium Right Identifiers was at its second highest level over the six-year period in 2015. At the vessel affiliation level, the number of affiliations leasing in quota for allocated groundfish stocks in 2015 was at its second lowest level over 2010-2015, but total pounds leased in by vessel

affiliations peaked in 2015. Estimated total transfer payments at the Moratorium Right Identifier level increased in 2014 and 2015, but 2015 total transfer payments remained lower than estimated annual transfer payments during 2010-2012. Estimated total transfer payments at the vessel affiliation level in 2015 increased from 2012-2014, but remained lower than the estimated total values in 2010 and 2011.

Opportunities for crew in the limited access groundfish fleet generally decreased from 2007 to 2015. The total number of crew positions on groundfish vessels fell annually from 2007 to 2015, dropping to a low of 1,913 positions in 2015 (-783 positions, -29.0% from 2007). Number of crew trips also fell to a nine-year low of 100,438 trips in 2015, a decline of 55,994 trips from 2007 (-35.8%). The number of crew days for the fleet increased slightly in 2015 from a nine-year low of 151,479 crew days in 2014, but overall the number of crew days in 2015 was 47,112 fewer than in 2007. As crew opportunities decreased over time, time spent per earning opportunity increased. New Hampshire saw the largest percent decline of any home port state in terms of crew positions, crew trips, and crew days over the nine-year period.

Median owner and crew shares per day on groundfish trips in 2015 increased for vessels 50' to <75' and vessels 75' and above compared to 2012-2014 values. Median owner share per day on groundfish trips in 2015 decreased for vessels 30' to <50' compared to 2014 values. Median owner and median crew shares per active vessel were generally highest in 2015 over the 2007-2015 period for all vessel size categories > 30'. The lone exception was median crew share for vessels 30' to < 50', which peaked in 2011.

Table 1. Summary of major trends, by fishing year (May through April). Includes all vessels with a valid limited access multispecies permit.[1]

Performance Metrics	2007	2008	2009	2010 Total	2010 Sector Vessels	2010 Common Pool Vessels	2011 Total	2011 Sector Vessels	2011 Common Pool Vessels
Groundfish gross revenue (in millions of 2010 dollars)	$91.2	$90.4	$84.7	$83.4	$81.3	$2.1	$88.5	$87.7	$0.8
Non-groundfish gross revenue (in millions of 2010 dollars)	$214.9	$204.0	$185.2	$212.3	$116.3	$96.0	$236.0	$142.0	$94.0
Total gross revenue (in millions of 2010 dollars)	$306.1	$294.4	$269.9	$295.6	$197.6	$98.1	$324.5	$229.7	$94.8
Groundfish average price (in 2010 dollars)	$1.43	$1.26	$1.21	$1.43	$1.42	$1.58	$1.43	$1.43	$1.58
Non-groundfish average price (in 2010 dollars)	$1.10	$1.02	$0.99	$1.19	$1.17	$1.22	$1.11	$1.11	$1.11
Number of active vessels	1,039	966	923	857	436	421	781	445	336
Number of active vessels that landed GF*	596	550	519	392	292	100	371	291	80
Number of groundfish trips	27,320	26,618	26,223	13,536	11,239	2,297	16,015	13,717	2,298
Number of non-groundfish trips	39,401	36,791	37,953	38,667	16,595	22,072	33,862	16,883	16,979
Number of days absent on groundfish trips	28,465	27,277	25,071	18,524	16,920	1,605	21,566	20,049	1,517
Number of days absent on non-groundfish trips	32,463	30,671	31,670	31,406	16,024	15,382	28,039	15,489	12,551
Total Crew Positions	2,697	2,532	2,433	2,263	NA	NA	2,170	NA	NA
Total Crew-trips	156,432	150,112	150,520	124,436	NA	NA	122,535	NA	NA
Total Crew-days	200,661	192,057	189,063	170,534	NA	NA	169,856	NA	NA

*This refers to vessels that landed allocated groundfish from at least one groundfish trip.

[1] Crew positions, crew trips, and crew days were calculated at the fleet-level only.

Table 1 (continued). Summary of major trends, by fishing year (May through April). Includes all vessels with a valid limited access multispecies permit.[2]

Performance Metrics	2012 Total	2012 Sector Vessels	2012 Common Pool Vessels	2013 Total	2013 Sector Vessels	2013 Common Pool Vessels
Groundfish gross revenue (in millions of 2010 dollars)	$67.7	$67.2	$0.6	$55.1	$54.1	$1.0
Non-groundfish gross revenue (in millions of 2010 dollars)	$227.0	$135.4	$91.6	$211.4	$128.7	$82.7
Total gross revenue (in millions of 2010 dollars)	$294.7	$202.5	$92.2	$266.5	$182.8	$83.7
Groundfish average price (in 2010 dollars)	$1.43	$1.43	$1.70	$1.30	$1.30	$1.53
Non-groundfish average price (in 2010 dollars)	$1.06	$1.03	$1.12	$1.05	$0.98	$1.19
Number of active vessels	762	445	317	734	419	315
Number of active vessels that landed GF*	356	286	70	311	231	80
Number of groundfish trips	14,652	13,005	1,647	10,677	9,163	1,514
Number of non-groundfish trips	32,847	17,297	15,550	32,778	17,943	14,835
Number of days absent on groundfish trips	20,076	19,007	1,070	17,407	16,371	1,035
Number of days absent on non-groundfish trips	28,940	16,341	12,599	29,180	16,962	12,218
Total Crew Positions	2,137	NA	NA	2,032	NA	NA
Total Crew-trips	117,562	NA	NA	106,913	NA	NA
Total Crew-days	169,097	NA	NA	158,121	NA	NA

*This refers to vessels that landed allocated groundfish from at least one groundfish trip.

[2] Crew positions, crew trips, and crew days were calculated at the fleet-level only.

Table 1 (continued). Summary of major trends, by fishing year (May through April). Includes all vessels with a valid limited access multispecies permit.[3]

Performance Metrics	2014 Total	2014 Sector Vessels	2014 Common Pool Vessels	2015 Total	2015 Sector Vessels	2015 Common Pool Vessels
Groundfish gross revenue (in millions of 2010 dollars)	$55.4	$54.6	$0.8	$51.2 ($56.0)**	$50.0 ($54.7)**	$1.2 ($1.3)**
Non-groundfish gross revenue (in millions of 2010 dollars)	$202.2	$123.7	$78.5	$218.4 ($238.7)**	$136.3 ($149.0)**	$82.1 ($89.7)**
Total gross revenue (in millions of 2010 dollars)	$257.6	$178.3	$79.3	$269.5 ($294.7)**	$186.3 ($203.7)**	$83.2 ($91.0)**
Groundfish average price (in 2010 dollars)	$1.28	$1.27	$1.65	$1.23 ($1.35)***	$1.22 ($1.34)***	$1.74 ($1.91)***
Non-groundfish average price (in 2010 dollars)	$1.01	$0.97	$1.08	$1.15 ($1.26)***	$1.19 ($1.30)***	$1.10 ($1.20)***
Number of active vessels	722	406	316	678	383	295
Number of active vessels that landed GF*	278	218	60	269	206	63
Number of groundfish trips	9,847	8,714	1,133	8,453	7,471	982
Number of non-groundfish trips	32,115	16,432	15,683	32,009	16,291	15,718
Number of days absent on groundfish trips	16,757	15,937	820	15,145	14,465	680
Number of days absent on non-groundfish trips	27,936	15,735	12,201	28,810	16,578	12,232
Total Crew Positions	1,999	NA	NA	1,913	NA	NA
Total Crew-trips	102,861	NA	NA	100,438	NA	NA
Total Crew-days	151,479	NA	NA	153,550	NA	NA

*This refers to vessels that landed allocated groundfish from at least one groundfish trip.
**Nominal gross revenue during Fishing Year 2015.
***Nominal average price during Fishing Year 2015.

[3] Crew positions, crew trips, and crew days were calculated at the fleet-level only.

1. INTRODUCTION

The Northeast Multispecies Fishery, referred to as the groundfish fishery, is managed by the New England Fishery Management Council (NEFMC). The groundfish fishery is carried out using both fixed and trawl gears.[4] The groundfish resource is distributed throughout waters of the Gulf of Maine (GOM) and Georges Bank (GB) and, to a lesser extent, Southern New England (SNE) and the Mid-Atlantic Bight. Prior to Fishing Year 2010, the groundfish fishery was primarily managed using effort controls, including Days at Sea (DAS) and trip limits. Amendment 13 to the groundfish Fishery Management Plan (FMP) was implemented in May 2004; it redefined initial allocations of DAS and allowed vessels to engage in DAS leasing and DAS transfers under certain conditions. Amendment 13 also introduced the "Sector Allocation" program, which gave fishermen the opportunity to voluntarily form "sectors", or groups of fishing vessels that would be allotted a share (quota) of the total Annual Catch Limit (ACL) for groundfish stocks. The fishing activity of sectors would be constrained by quotas rather than DAS. Sectors could request exemptions from many of the traditional input controls such as trip limits. In July 2004, the Georges Bank Hook Gear Sector was authorized and assigned an allocation for Georges Bank cod. The second sector, the Georges Bank Cod Fixed Gear Sector, was authorized and assigned a Georges Bank cod allocation in May 2007. This set the stage for Amendment 16 to the Northeast Multispecies FMP, which implemented a catch share program on May 01, 2010.

The catch share program was designed to comply with catch limit requirements and stock rebuilding deadlines required under the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (MSA). The new groundfish management program contained two significant changes. The first established "hard quota" annual catch limits (ACLs) for all 20 stocks in the groundfish complex. The second expanded the use of "sectors". Under Amendment 16, sectors are allocated subdivisions of groundfish ACLs called Annual Catch Entitlements (ACE) for all allocated groundfish stocks. All permit holders with a limited access groundfish permit that was valid as of May 01, 2008 were eligible to participate in a sector, including holders of inactive permits currently held in Confirmation of Permit History (CPH).

Sectors, including state permit banks, receive ACE for nine of 13 groundfish species in the FMP and are exempt from many traditional effort controls.[5] Each limited access groundfish permit has a potential sector contribution (PSC) that is a percentage of the total quota allocation for each allocated groundfish stock; these percentages are based on that permit's fishing history. When a fisherman becomes a sector member, his PSC is pooled with that of the other members of his sector; the pooled PSCs of the sector become the sector's ACE. Fishermen may hold limited access eligibilities, which are linked to a Moratorium Rights Identifier (MRI), in CPH. CPH permits are limited access groundfish eligibilities that are not attached to an actual vessel. An important consequence of Amendment 16 is that it allowed fishermen with permits in CPH to

[4] Fixed gear includes gillnet and hook gears including bottom longline, tub trawls, and rod and reel.

[5] The nine allocated species are American plaice (*Hippoglossoides platessoides*), cod (*Gadus morhua*), haddock (*Melanogrammus aeglefinus*), pollock (*Pollachius virens*), redfish (*Sebastes fasciatus*), white hake (*Urophycis tenuis*), winter flounder (*Pseudopleuronectes americanus*), witch flounder (*Glyptocephalus cynoglossus*), and yellowtail flounder (*Limanda ferruginea*). The four non-allocated groundfish species are halibut (*Hippoglossus hippoglossus*), ocean pout (*Zoarces americanus*), windowpane flounder (*Scophthalmus aquosus*), and wolffish (*Anarhichas lupus*). All references to groundfish species include these 13 species unless there is specific mention of the nine allocated species. Non-groundfish species are any species other than the 13 groundfish species listed here.

join sectors or to remain in the common pool with the option of leasing DAS, which was granted by Amendment 13. When a fisherman holding a CPH permit joins a sector, the PSC associated with those permits also becomes part of that sector's ACE. This is significant because it means that a fisherman can lease the PSC associated with his CPH permits to other sector members, or his sector can lease the PSC associated with his CPH permits to other sectors through ACE trading. A fishing vessel owner with groundfish permits in a sector may also opt to transfer quota, through leasing, between the groundfish permits they hold, including permits they have placed in CPH. This allows the owner the flexibility to consolidate quota on fewer vessels (including a single vessel) and reduce the costs associated with operating multiple vessels. However, sectors are not permitted to transfer ACE to or from common pool vessels. In 2010, approximately half (46%) of the vessels with limited access groundfish permits opted to remain in the common pool, likely because of their small individual potential contribution to a sector's total ACE. Common pool vessels act independently of one another; each vessel is constrained by the number of DAS it can fish, by trip limits, and by time and area closures designated in the FMP. These restrictions help ensure that the groundfish catch by common pool vessels does not exceed the common pool's allocation of the total ACL before the end of the fishing year.

Nineteen sectors operated in 2015 (see 80 FR 25143, May 1, 2015).[6] Two of these are state-operated permit bank sectors, and two others are "lease only" sectors,[7] which hold eligible permits with accumulated ACE that they can make available to fishermen that intend to actively fish for groundfish. Each sector establishes its own rules for using its allocation, but the allocated catch restrictions are applicable to the sector as a unit (i.e., not to individual vessels in the sector). Sector members are expected to work together to ensure that, as a whole, their sector's ACE is not exceeded.

This report provides an evaluation of the economic and social performance of the groundfish fishery for fishing years 2007-2015 (May 01, 2007 – April 30, 2016). In this report, all references to year refer to fishing years. [8] Table 1 presents data on major trends in the groundfish fishery by total fleet, sector vessels, and common pool vessels. Differences in the performance of sector and common pool vessels are discussed in Section 1.2; thereafter, the report focuses on the performance of the groundfish fleet as a whole. This report includes a subset of indicators that are sufficiently developed for reporting. These cover aspects of financial viability (landings, revenue, number of vessels and effort, and average vessel performance) and distributional outcomes (employment and fleet diversity). Gross revenues are based on landings and ex-vessel (first sale) prices and—together with fishing effort, operating costs, and quantities of fishing inputs—provide an indication of vessel performance. Employment opportunity is measured by the number of crew positions, crew trips, and crew days. Fleet diversity is measured

[6] These sectors were the Fixed Gear Sector (FGS), the Maine Coast Community Sector (MCCS), the Northeast Coastal Communities Sector (NCCS), Northeast Fishery Sectors 1 through 11 (NEFS 1 – NEFS 11), Northeast Fishery Sector 13 (NEFS 13), Sustainable Harvest Sectors 1 and 3 (SHS 1 and SHS 3), the State of Maine Permit Bank Sector, and the State of New Hampshire Permit Bank Sector. The Georges Bank Cod Hook Sector (operating since 2004) and the Georges Bank Cod Fixed Gear Sector (implemented in 2006) operated as separate sectors prior to fishing year 2010, when all members of the Georges Bank Cod Hook Sector joined FGS. In fishing year 2013, the Port Clyde Community Sector became known as the Maine Coast Community Sector.

[7] NEFS I and NEFS IV are lease only sectors. The SHS 3 Sector operated as a lease only sector through FY2014, but some members began actively fishing in FY2015.

[8] In the northeast groundfish fishery, a fishing year lasts from May 1 – April 30. For example, fishing year 2007 lasts from May 1, 2007 – April 30, 2008.

by vessel size and vessel revenue categories, and by distributions of revenues among individual vessels and vessel affiliations.

The trends in this report must be evaluated in the context of the quota changes that have occurred for fishing year 2015, as well as over the five years since Amendment 16 has been in place. From 2014 to 2015, several commercial sub-ACLs were cut from their 2014 levels: eastern Georges Bank cod (-17.1%), Gulf of Maine cod[9] (-75.1%), Georges Bank yellowtail flounder (-20.3%), CC/GOM yellowtail flounder (-4.4%), Georges Bank winter flounder (-44.1%), Gulf of Maine winter flounder (-45.2%), and ocean pout (-1.0%). Some stocks' sub-ACLs increased from their 2014 levels: Georges Bank cod (+1.0%), eastern Georges Bank haddock (+77.5%), Georges Bank haddock (+26.7%), Gulf of Maine haddock (+119.7%), SNE/MA yellowtail flounder (+2.7%), American plaice (+1.9%), SNE/MA winter flounder (+7.9%), redfish (+4.4%), white hake (+1.5%), and pollock (+3.8%). Atlantic halibut, which is not an allocated species, saw a 12.3% increase in its commercial sub-ACL from 2014 to 2015. There were no changes from 2014 to 2015 in the commercial sub-ACLs for the allocated stock of witch flounder. The non-allocated stocks of northern windowpane flounder, southern windowpane flounder, and wolfish also had no changes in their sub-ACLS from 2014 to 2015 (Table 2).[10]

Sub-ACLS for several allocated stocks were at their lowest point in 2015 for the 2010-2015 time period, with substantial cuts overall since the implementation of Amendment 16 in 2010. The commercial sub-ACL for Gulf of Maine cod in 2015 (207 mt) represents a decrease of 4,360mt (-95.5%) since 2010, and the commercial sub-ACL for CC/GOM yellowtail flounder in 2015 (458 mt) was a decrease of 321mt (-41.2%) since 2010. The commercial sub-ACL for witch flounder hit a low in 2013, and remained there in 2014 and 2015, for an overall decline of 28.4% since 2010. Sub-ACLs for five allocated stocks were at a high in 2015, with overall increases in quota since 2010: eastern Georges Bank haddock (+48.2%), Gulf of Maine haddock (+16.1%), redfish (+61.2%), and white hake (69.9%). SNE/MA winter flounder was first allocated in 2011 and the commercial sub-ACL was at a five-year high in 2015 (+79.9% since 2011). The sub-ACL for Atlantic halibut, a non-allocated stock, was also at its highest point in 2015 (Table 2).

Amendment 16 contains several broad goals and objectives, carried over from Amendment 13. This report does not provide a detailed analysis of progress toward achieving these goals and objectives. However, where possible, it addresses trends related to Goal 2, Goal 4, and Objective 7, particularly for economic efficiency and diversity of the groundfish fleet.[11] For example, changes in economic efficiency may be reflected by changes in revenue per unit effort and revenue per vessel and by changes in the Lowe Index, which measures productivity of the fleet. The diversity of the groundfish fleet can be explored by examining trends in (1) the

[9] While there was a significant cut in the GOM cod quota from 2014 to 2015, the additional restrictions on fishing for GOM cod that were implemented for a portion of 2014 were no longer in place for 2015. For additional details, see 79 FR 67362: Emergency Gulf of Maine Cod Management Measures.

[10] Sources: Northeast Multispecies Framework Adjustment 42 (2007-2008 Target TACs); 2009 Secreterial Final Interim Action (2009 Target TACs); NOAA Fisheries Groundfish Monitoring Reports webpage (2010-2015 sub-ACLs)

[11] Goal 2 in Amendment 16 is "create a management system so that fleet capacity will be commensurate with resources status so as to achieve goals of economic efficiency and biological conservation and that encourages diversity within the fishery." Goal 4 is "minimize to the extent practicable, adverse impacts on fishing communities and shore side infrastructure." Objective 7 states: "To the extent possible, maintain a diverse groundfish fishery, including different gear types, vessel sizes, geographic locations, and levels of participation."

number of vessels and vessel affiliations; (2) the geographic distribution of landings and revenues across ports and states; (3) employment indicators across ports and states; and (4) the distribution of revenues among vessels and vessel affiliations.

The NEFSC released the first performance report for the FY2010 groundfish fishery in 2011 (see Kitts et al. 2011), with subsequent performance reports released for the 2011, 2012, and 2013 fishing years (See Murphy et al. 2012, Murphy et al. 2014, Murphy et al. 2015). The NEFSC will continue to track and develop performance indicators pertinent to the groundfish fishery and other regional fisheries. Furthermore, the socioeconomic metrics and analyses provided in this report may be used for future reference in a possible catch share program review of the groundfish fishery. Lastly, external to the groundfish performance report, the Social Sciences Branch has conducted, and will continue to conduct, a variety of projects in the Northeast to further the understanding of social and economic issues in the groundfish fishery and other fisheries in the region.

1.1. Data and Analytical Approach

The vessels whose activities are evaluated in this report are those with valid limited access multispecies permits during fishing years 2007-2015. An active vessel is defined as a vessel with a limited access groundfish permit that has revenue from the landing of any species on any commercial fishing trip. Unless otherwise noted**,** weights are given in landed pounds (after heading/gutting) rather than in live pounds (whole fish), as prices are commonly calculated on a per landed pound basis. Landings data in this report should not be used to conduct comparisons with sector sub-ACLs or the catch monitoring reports issued for sectors, because the ACLs are calculated and monitored in live pounds and include both landings and discards. Gross revenues are revenues earned from fish that is landed and sold. This report uses the term total gross revenue when referring to the total revenue earned by limited access groundfish vessels from landing both groundfish and non-groundfish species (i.e., combined groundfish and non-groundfish revenue). When the distinction is needed, the report will reference "groundfish revenue" or "non-groundfish revenue".

Throughout this report, data pertaining to revenue and pounds of fish (e.g., landed, leased) are presented as rounded numbers. In cases where data are being presented at the individual vessel level or the individual trip level, values are presented in thousands (e.g., thousands of 2010 dollars; thousands of pounds). In cases where data are aggregated at the fleet, home port, or vessel size class level, values are presented in millions (e.g., millions of 2010 dollars; millions of pounds). As a result, some values are presented as $0.0 or 0.0. This does not mean that these values are truly equal to zero; rather, this indicates that these values could not be rounded up to $100,000 or 100,000 pounds (i.e., $0.1 or 0.1 lbs.). In cases where there are truly no data to report, "NA" was used as a placeholder.

All monetary metrics (revenues, prices, and costs) have been adjusted for inflation by converting nominal dollars for a given year into real, constant dollars. The GDP Implicit Price Deflator was used to adjust nominal amounts for inflation, with the second quarter of calendar year 2010 as the base time period. Nominal amounts observed for 2015 were indicated for selected metrics.

This report contains information about commercial fishing trips only.[12] A groundfish trip is defined as a trip where the vessel owner or operator declared, either through the vessel

[12] Past reports for Fishing Year 2010 and Fishing Year 2011 included party/charter trips as well.

monitoring system (VMS) or through the interactive voice response system, that the vessel was making a groundfish trip. This includes trips on which groundfish DAS were used, including monkfish (*Lophius americanus*) trips that used groundfish DAS.

Some statistics are reported by both home port and port of landing. "Home port" does not necessarily identify the port where fish are landed, but rather it is the information on "city and state where vessel is moored" provided by vessel owners on the vessel permit applications. Most often, the home port is the port where supplies are purchased and crew is hired, although this does not apply in all cases.[13] "Landed port" is the actual port where fish are landed. We report by home port and by landed port because the implications of each are different. For example, revenue by home port gives an indication of the benefits received by vessel owners and crew (and some fishing-related businesses such as gear suppliers) based in that port. Revenue by landed port gives an indication of the benefits that other fishing-related businesses (primarily businesses that handle fish, such as dealers and processors) derive from landings in their port. We identified the top six groundfish home ports[14] and landed ports in the Northeast based on average value for the nine year time period. For these six ports, we present data on landings, revenue, and the number of active vessels. We also present these metrics for the seven home port states and landed port states in the Northeast that are most involved in the groundfish fishery. For many home ports and landed ports, data confidentiality requirements are such that there are either too few vessels or too few dealers to allow for data reporting at the home port or landed port level. Therefore, data on landings, revenue, and the number of active vessels are aggregated to home port state(s) and landed port state(s).

Some indicators in the report use a measure of time called a "day absent." A day absent is defined as the number of days (24 hours each) a vessel is "absent" from port and is calculated by subtracting the sail date/time from the land date/time as entered on vessel logbook records, called vessel trip reports (VTRs). For comparative purposes, many measures have been calculated for both groundfish landings and all species landings. "All species" refers to the total of all species of fish or shellfish landed, including groundfish. The home port and length of a vessel are provided by the vessel owner on the vessel's yearly permit application. Data on vessel landings, nominal prices, and nominal revenues come from seafood dealer reports. Information about the number of fishing trips and crew size is obtained from VTRs.[15] In addition to mean values, standard deviations are provided to show the degree of variability in the data. Some standard deviations are large relative to the mean, indicating that the values are widely dispersed. Therefore, care should be used when comparing mean values that have large standard deviations.

Several performance metrics in this report, including effort and revenue, are examined by vessel size category using four vessel length classes: less than 30', 30′ to <50', 50′ to <75', and

[13] Alternative port affiliation data are available. Principal port declaration and the vessel owner's mailing address are also entered on the permit application. However, actual landings by port may vary widely from what a vessel owner thinks his principal port of landing will be before the fishing year begins. Also, an owner's mailing address can be different from a vessel's base of operation. Therefore, home port is typically used in social and economic studies to establish port affiliation (as in this report). As the home port listed for a vessel can change over the year depending on what is declared on permits, this report assigns a vessel's home port to be the first home port that is used during the given fishing year.

[14] In terms of groundfish revenue by home port, Chatham, MA is the 7th largest port. Due to data confidentiality concerns, we are unable to present revenue values for the 6th largest home port in the fishery.

[15] All data are from GARFO's fishing year 2007 – 2015 Data Matching Imputation System, or DMIS, database (a combination of seafood dealer reports, vessel trips reports, and quota monitoring reports) as of March 29, 2017. Differences in results reported in each year's annual performance report are due to updates to the DMIS database.

75′ and above. Many of the vessels in the less than 30' length class are considered to be "skiffs," a colloquial term used by fishermen and fishery managers to refer to small vessels, generally unseaworthy, used only for the attaching of a permit. Although skiffs may appear as inactive vessels in the database, the quota or DAS associated with their permits is commonly transferred to other vessels.

Some of the metrics in this report are presented at both the individual and at the affiliated vessel level. To evaluate changes at the affiliated vessel level, vessels were grouped according to ownership patterns. Permit applicants are required to list all persons and entities that have an ownership interest in the vessel for which a permit is being registered. Using this database, it is possible to find affiliations among vessels. We define "vessel affiliations" as networks of vessels connected through common owners. Vessels connected to one another through ownership, for the purpose of data analyses, are deemed a single vessel affiliation. For example, two vessels owned by one person are considered to be in one vessel affiliation. Further, a vessel owned in partnership is considered to be in the same vessel affiliation with a second vessel if that second vessel is owned by one of the partners. A vessel affiliation could have multiple vessels and/or multiple owners or it could consist of a single vessel and a single owner. A vessel affiliation can include vessels in multiple sectors and/or the common pool. It is likely that vessels in the same vessel affiliation are subject to some degree of joint decision making among common owners. The definition of vessel affiliation in this report is broader than that used for regulatory purposes under the Regulatory Flexibility Analysis (RFA). For RFA, an ownership group consists of all permits associated with a unique combination of owners.

1.2. Performance of Sector and Common Pool Vessels

There are fundamental differences in the characteristics of sector and common pool vessels and in their ACE and DAS allocations.[16] Most common pool vessels are regulated by DAS and fleet-wide trimester quotas.[17]A large number of common pool vessels have few or no DAS. Some common pool vessels have small vessel exemption permits (for vessels less than or equal to 30') or hand gear permits (HA), which exempt them from DAS constraints. Finally, vessels opting into the common pool landed significantly less groundfish during the landings qualification period of 1996 through 2006 than those electing to operate in sectors, which resulted in the common pool being allocated only 1-2% of the total ACL for all stocks. In 2015, sector vessels accounted for 97.7% of the total value of groundfish landed (Table 1).

This section discusses major trends in performance, broken down by sector and common pool vessels, as presented in Table 1. Differences in these performance measures should not serve alone as the basis for an evaluation of catch share versus DAS management regimes. In Sections 2 through 8 of this report, performance indicators are reported for the active groundfish fleet as a whole, with sector and common pool vessels combined. Section 5 is an exception; Section 5 covers ACE/PSC leasing by sector vessels and does not include DAS leasing by common pool vessels.

[16] These may include differences in physical characteristics of the vessel, different fishing histories, and different attitudes about sector management. Also, fishermen presumably opted to join a sector or remain in the common pool based on their analysis of the advantages and disadvantages to them of each regimen.

[17] For additional information on common pool fishing regulations see the Greater Atlantic Regional Fisheries Office's northeast multispecies webpage.

The total number of vessels with a limited access groundfish permit and revenue from any species on any trip (active vessels), declined by 179 (-20.9%) over the 2010-2015 period. The number of active vessels that landed groundfish also declined every year during this six-year period. Possible reasons for the declining numbers of active vessels overall and of active vessels that target groundfish will be addressed in Sections 3 and 6. In 2010, the number of active vessels enrolled in sectors and in the common pool was roughly equal; of the 857 active vessels in the limited access groundfish fleet, 436 were enrolled in sectors and 421 were enrolled in the common pool. In 2015, there were 678 active vessels in the limited access groundfish fleet, with 383 vessels enrolled in sectors and 295 vessels in the common pool. The number of active vessels enrolled in sectors has been on a downward trend since 2012. In percentage terms, the proportion of active vessels enrolled in sectors initially increased during 2010-2012 (50.9% to 58.4%), but then declined from 2012-2015 (58.4% to 56.5%) (Table 1).

Total gross revenue (the sum of groundfish and non-groundfish revenues) for the entire fleet was $269.5 million in 2015, a 4.6% increase from 2014 and the highest value seen by the fishery since 2012. For sector vessels, the trend in total gross revenue is similar to the trend for the limited access groundfish fleet as a whole, with total gross revenue for sector vessels growing 4.5% from its six-year low in 2014 ($178.3 million) to 2015 ($186.3 million). The six-year high for total gross revenue earned by sector vessels was in 2011 ($229.7 million). Among common pool vessels, total gross revenue grew 4.9% in 2015 ($83.2 million) from its six-year low in 2014 ($79.3 million). The high point for total gross revenue by common pool vessels was in 2010 ($98.1 million), with declines each year from 2011-2014 (Table 1).

Groundfish revenue generated by the limited access groundfish fleet declined to a six-year low of $51.2 million in 2015. This represents a 42.1% decline from 2011, when fleet-wide groundfish revenue peaked at $88.5 million. Sector vessels also experienced a decline in groundfish revenue throughout the 2011 – 2015 period, hitting a 6-year low of $50.0 million in 2015. For common pool vessels, groundfish revenue in 2015 ($1.2 million) was at its highest value since its 2010 peak ($2.1 million). However, because the vast majority of groundfish revenue is generated by sector vessels, trends in the common pool have very little influence on fishery-wide performance (Table 1).

Non-groundfish revenue for the fleet as a whole reached a nine-year high in 2011 ($236.0 million), then declined each year from 2012-2014. In 2015, non-groundfish revenue increased to $218.4 million (+8.0% from 2014). For sector vessels, the trend in gross revenue for non-groundfish is similar to the limited access groundfish fleet as a whole. In 2011, sector vessels generated a six-year high of $142.0 million in non-groundfish revenue. For common pool vessels, non-groundfish revenues declined from 2010-2014 but increased by $3.6 million (+4.6%) from 2014 to 2015 (Table 1).

Common pool vessels earned higher average prices per pound for groundfish species than sector vessels during 2010 - 2015. This trend appears surprising on first look, as ex-vessel prices have been found to increase following the implementation of catch shares in a number of U.S. fisheries (Brinson and Thunberg, 2016) and one might expect that vessels that remain under traditional effort controls (common pool vessels) would receive lower ex-vessel prices than those under catch share management (sector vessels). However, because the makeup of vessels and groundfish species landed within sectors and the common pool can be quite different, attributing the price differential to management (type or form or regime) would be hasty. The price premium common pool vessels receive may reflect perceptions that the fish caught by these vessels is fresher and of higher quality since, on average, common pool vessels tend to be

smaller and take more single-day trips than sector vessels. The average groundfish price for sector vessels has been on a declining trend since 2012, and reached a low of $1.22/lb. in 2015. For common pool vessels, the trend is quite different, with the 2015 groundfish price of $1.74/lb. being a high since 2010. Across all limited access groundfish vessels, the 2015 groundfish price of $1.23/lb. is a six-year low and average groundfish prices decreased every year from 2012-2015 (Table 1).

Across all limited access groundfish vessels, the 2015 non-groundfish average price of $1.15/lb. was the highest since 2010, when non-groundfish average price for the fleet peaked at $1.19/lb. Average non-groundfish prices for sector vessels ($1.19/lb.) were at a six-year high in 2015. The 2015 high follows a period of annual decline from 2010-2014. For common pool vessels, average non-groundfish prices fluctuated up and down during 2010-2015. In 2015, average non-groundfish price for common pool vessels was slightly higher than 2014 (+$0.02/lb.), but lower than 2013 (-$0.09/lb.). Average non-groundfish price for common pool vessels peaked at $1.22/lb. in 2010 (Table 1).

Effort in the groundfish fishery is represented in part by the number of active vessels, the number of trips taken, and by days absent on trips. Effort targeting groundfish has decreased for both sector and common pools vessels since 2010. For the fleet as a whole, the number of vessels taking at least one groundfish trip declined every year from 2010-2015 to a low of 269 vessels in 2015 (-20.9% from 2010). Within the group of vessels that target groundfish, the number of sector vessels declined each year since 2010, reaching a low of 206 vessels in 2015 (-29.5% from 2010). The number of common pool vessels taking at least one groundfish trip also generally declined from 2010 to 2015, with 37.0% (-37 vessels) fewer common pool vessels taking a groundfish trip in 2015 than 2010. The total number of groundfish trips and the total number of days absent on groundfish trips also decreased to six-year lows for both sector and common pool vessels in 2015 (Table 1).

The number of non-groundfish trips taken by vessels in the limited access groundfish fleet also declined overall between 2010 and 2015, though not as sharply as the number of groundfish trips. The number of non-groundfish trips for the groundfish fleet as a whole fell annually to a six-year low of 32,009 trips in 2015, a 17.2% decline from the 38,667 non-groundfish trips taken by the fleet in 2010. By far the largest single year decline in the number of non-groundfish trips came in 2011, in which there were 4,805 fewer non-groundfish trips taken than in 2010. A modest overall decline in the number of non-groundfish trips taken by sector vessels since 2010 (-1.9%) led to a six-year low of 16,291 non-groundfish trips in 2015. For common pool vessels, the number of non-groundfish trips in 2015 (15,718 non-groundfish trips) was at its highest since 2011. The total number of days absent on non-groundfish trips shows no clear long-term trend for either sector or common pool vessels; sector vessels spent the most days absent on non-groundfish trips in 2013 (16,962 days), while common pool vessels spent the most days absent on non-groundfish trips in 2010 (15,382 days) (Table 1).

2. LANDINGS AND GROSS REVENUES

Gross revenues are one important indicator of financial performance. In commercial fishing, gross nominal revenues are a function of the amount of fish landed and the price paid at the time of sale. Prices paid by dealers vary by species and may fluctuate as a result of short- and long-term market changes. Annual changes in gross revenues can result from three different factors: changes in prices paid for fish at the dock, changes in quantity of landings, and changes

in the species composition of the landings. Flexibility to target specific species and/or market categories at times when market values are high can be important in maximizing gross fishing revenues. Information is provided below on landings, overall gross revenues, and prices for the 2007-2015 time period.

In this report, nominal revenues have been adjusted to account for the effects of inflation. Nominal revenues observed throughout the nine-year time span were converted to real revenues using the GDP Implicit Price Deflator, with the second quarter (April-June) of calendar year 2010 as the base time period. Nearly all revenues contained in this report are in constant 2010 dollars. We report monetary metrics in nominal amounts observed during the fishing year for selected metrics only (see Table 1, Table 3, and Table 4). Unless otherwise indicated, the discussion in this report refers to monetary amounts in real or constant terms, i.e. amounts that have been adjusted for inflation.

2.1. Landings

Total groundfish landings for all trips in 2015 were at a nine-year low of 41.6 million pounds (lbs.) (Table 3). The overall decrease in groundfish landings from 2007-2015 totaled 21.9 million lbs. (-34.5%), with the largest year-to-year decreases being between 2009 and 2010 (-11.4 million lbs.) and 2011-2012 (-14.5 million lbs.). In contrast, non-groundfish landings remained relatively steady, with a decrease of 6.3 million lbs. (-3.2%) from 2007-2015. Total landings of all species on all trips were at a nine-year low of 231.1 million lbs. in 2015. Groundfish landings accounted for 24.5% of total landings in 2007, and reached a nine-year high of 27.2% in 2009. The groundfish share of total landings then decreased every year until 2013, when it reached a nine-year low of 17.4%. In the following two years, there was a marginal increase to 18.0% in 2015 (Table 3).

As virtually all (>99%) groundfish landings occur on groundfish trips, the decreasing trend for groundfish landings in Table 3 also is apparent in Table 4. Groundfish landings on groundfish trips reached a nine-year low in 2015. Non-groundfish landings on groundfish trips decreased each year from 2007-2010. Since 2010, there have been year-to-year fluctuations. Non-groundfish landings on groundfish trips were 24.6 million pounds in 2015, a 1.0 million pound increase since 2010. Total landings of all species on groundfish trips during 2015 (66.2 million lbs.) were at the second lowest level of the 2007-2015 time period, with the low point occurring in 2013 (62.9 million lbs.). The annual groundfish share of total landings on groundfish trips has generally been 60-70%, though there appears to be a relatively minor decreasing trend since 2010 (Table 4).

2.2. Gross Revenues

Total gross groundfish revenues earned on all trips in 2015 were at a nine-year low of $51.2 million, a $40.0 million (-43.9%) decrease from 2007 (Table 3). During the nine-year time period, groundfish revenue started at a high point of $91.2 million in 2007 and decreased moderately through 2010 (-$7.8 million; -8.6%). After increasing to $88.5 million in 2011, groundfish revenue then sharply decreased in 2012 (-$20.8 million from 2011) and 2013 (-$12.6 million from 2012). Groundfish revenues essentially remain constant between 2013 and 2014, but decreased in 2015 to the nine-year low. Non-groundfish revenue on all trips follow a

different trend compared to groundfish revenue. Non-groundfish revenues in 2015 ($218.4 million) marked the third highest value during the nine-year period, behind 2011 ($236.0 million) and 2012 ($227.0 million).

Combining groundfish and non-groundfish revenue, total gross revenue earned on all trips taken by the limited access groundfish fleet decreased by $36.6 million (-12.0%) from 2007 to 2015. The highest revenue year was 2011 ($324.5 million) and the lowest revenue year was 2014 ($257.6 million). Despite 2015 being a nine-year low for groundfish revenue on all trips, total gross revenue was at its highest level since 2012; due in part to an increase in non-groundfish revenues from 2014 to 2015 (+16.2 million; +8.0%). Groundfish revenue accounted for 29.8% of total revenue on all trips in 2007 and reached a nine-year high of 31.4% in 2009. The groundfish share of total revenue then decreased every year since, reaching a nine-year low of 19.0% in 2015 (Table 3).

The decreasing trend for groundfish revenue on all trips in Table 3 also is apparent in Table 4, which shows landings and revenues for groundfish trips. Groundfish revenue on groundfish trips reached a nine-year low in 2015 of $51.1 million. Non-groundfish revenue on groundfish trips decreased overall from 2007-2010. Since the nine-year high of 2007, non-groundfish revenue on groundfish trips decreased by $22.1 million (-51.3%) to $21.0 million in 2015.

Total gross revenue earned on groundfish trips reached a nine-year low of $72.1 million in 2015, representing a decrease of $62.0 million (-46.2%) from the nine-year high of $134.1 million in 2007. When considering only the five most recent years in the time series, there has still been a $48.3 million decrease in total gross revenue from groundfish trips. The annual groundfish share of total revenue on groundfish trips has ranged from a low of 67.9% in 2007 to a high of 78.0% in 2010. In 2015, groundfish revenue accounted for 70.9% of revenue earned from all species landed from groundfish trips (Table 4).

2.2.1. Revenues by Landing Port and Home Port

Total gross revenues by landing state and home port state are presented in Table 5 and Table 6, respectively. Connecticut is the only state of landing to have increased total revenue from 2007-2015; Massachusetts, Maine, New Hampshire, New Jersey, New York, and Rhode Island all experienced decreases over the nine-year period (Table 5). Connecticut and New Jersey were the only home port states to have increased total revenue over the nine-year period. Total revenues earned by vessels homeported in New York were the same in 2015 as they were in 2007 (Table 6).

Massachusetts was the highest-value landing port state for all species during every year from 2007-2015. In 2007, 55.7% of total gross revenue was from vessels landing in Massachusetts. Throughout the nine-year period this figure remained over 50%, but decreased slightly to a nine-year low of 52.5% in 2015. Absolute total gross revenue from landings in Massachusetts increased to a nine-year high in 2011 ($188.9 million), but has since been on a generally decreasing trend to $141.6 million in 2015. The largest groundfish landing ports in Massachusetts, New Bedford, Gloucester, and Boston, all experienced nine-year highs for total gross revenue in 2011, while highest total gross revenue for Chatham as a landing port was in 2014. All four of these landing ports have experienced general downward trends in total gross revenue since 2011. However, during 2015 there were increases in total gross revenue compared to 2014 for the port of Gloucester ($0.9 million; +3.5%) and the port of New Bedford (+$4.0 million; +5.4%) (Table 5).

The second-highest value landing port state for total gross revenue over 2007-2015 was Rhode Island. Rhode Island's nine-year high in total gross revenue occurred in 2007, with 2008 closely behind. Following a steep decline to a nine-year low of $28.0 million in 2009, total gross revenue partially rebounded and was $3.1 million (-8.2%) lower in 2015 compared to 2007. Point Judith, the largest groundfish landing port in the state, reached a nine-year high for total gross revenue in 2013 ($28.6 million). The value of all species landed in the port in 2014 and 2015 remained very close to its 2013 peak (Table 5).

The next three landing states by total gross revenue for 2007-2015 were New Jersey, Maine, and New York. These states experienced relatively similar levels of revenue in most years. In 2015, New Jersey was the number three port in total gross revenue behind Massachusetts and Rhode Island, while in 2014, Maine held the number three spot. From 2007-2015 New Jersey experienced a $0.5 million (-1.9%) overall decline in total gross revenue, though there is no clear revenue trend in the most recent years. Maine experienced a low point in total gross revenue in 2009, but has since seen moderate increases, with 2014 and 2015 yielding higher revenues than 2009-2013. Maine's top landing port, Portland, had similar total gross revenue trends to the state as a whole. New York had a $6.3 million (-30.1%) decline in total gross revenue during 2007-2015, and experienced revenue decreases every year since 2011 (Table 5).

The bottom two landing states by total gross revenue for 2007-2015 were New Hampshire and Connecticut. New Hampshire generally experienced declines in total gross revenue during the nine-year period, with the largest percentage decline of any landed port state over 2007-2015 (-$2.4 million; -38.7%). Connecticut generally saw increases in total gross revenue over the nine-year period, with a $3.6 million (+116.1%) increase from 2007 to 2015. Connecticut also saw revenue increases every year from 2007-2012, and experienced a nine-year high of $8.1 million in 2012. The remaining states in the Northeast that had landings by limited-access groundfish permit holders experienced year-to-year fluctuations in total gross revenue during 2007-2015, but total gross revenues increased 35.3% overall, with a high of $20.7 million in 2015 (Table 5).

The distribution of total gross revenue among home port states (Table 6) is similar to that seen by landing state (Table 5). Many of the total gross revenue trends are also similar between landing port and home port. Massachusetts was the top total gross revenue-earning home port state annually from 2007-2015, but experienced its three lowest revenue years from 2013-2015. As a home port, total gross revenues in Massachusetts declined by $23.2 million (-15.0%) from 2007 to 2015. The four largest groundfish home ports in Massachusetts all saw nine-year lows in one of these most recent three years as well. Overall total gross revenue declines from 2007-2015 in these four Massachusetts home ports ranged from 9.8% (New Bedford) to 28.0% (Chatham). Home port total gross revenue in Massachusetts tended to be lower than landing port revenue. Rhode Island, the second-highest ranking state in value from all species by home port, saw revenue decreases in the early part of the time series but experienced only minor changes since 2012. Overall, total gross revenue for Rhode Island as a home port has decreased from 2007-2015 by $6.6 million (-15.9%) The third and fourth states by home port for total gross revenue, Maine and New York, both tended to have higher revenue by home port than landing port. Maine's total gross revenue by home port reached a nine-year low in 2015 ($24.6 million), with an overall decline of $5.5 million (-18.3%) over 2007-2015. New York generally experienced relatively minor year-to-year fluctuations in home port total gross revenue, and 2015 revenue was equal to that from 2007. Among the lower-ranking total gross revenue states by home port,

Connecticut saw a generally positive trend while New Hampshire saw a generally negative trend; these patterns are consistent with the trends in total gross landing port revenue for these states. New Jersey experienced a nine-year high in home port total gross revenue of $24.0 million during 2015, with an overall increase of $1.6 million (+7.1%) from 2007-2015. As a home port state, New Hampshire lost $5.0 million (-54.3%) in total gross revenue from 2007-2015 (Table 6).

For groundfish revenue by landing port (Table 7), Massachusetts was the top state in every year from 2007-2015. For each year, over 75% of groundfish landing revenue was attributed to Massachusetts ports. Groundfish revenues in Massachusetts increased from 2007-2011 before sharply declining in 2012 and 2013. In 2015, groundfish revenues reached a nine-year low of $42.7 million, representing a decline of $33.6 million (-44.0%) since 2011. Since 2010, New Bedford has been the top groundfish landing port in Massachusetts, but groundfish revenue in the port decreased by $11.7 million (-39.5%) from 2010 to 2015. Gloucester was the second-highest ranked groundfish landing port in Massachusetts over this same time period, but also experienced significant revenue decreases of $13.8 million (-49.8%) from 2010 to 2015. The 2015 groundfish landing revenue totals in New Bedford ($17.9 million) and Gloucester ($13.9 million) represent nine-year lows. The third largest groundfish landing revenue port in Massachusetts in 2015, Boston, did not experience the same degree of revenue decreases as New Bedford and Gloucester since 2010. While 2015 groundfish landing revenue for Boston ($9.4 million) was lower than each year from 2010-2014, the figure is slightly higher than experienced during 2007-2009. Chatham, the fourth largest groundfish landing port in Massachusetts over the 2007-2015 period, experienced sharp declines in groundfish revenue over the course of the nine years. Of all the major landing ports, Chatham has seen the largest percentage decline in groundfish revenue since 2007 (-85.3%) and since 2011 (-78.3%), the peak year for groundfish revenue in Massachusetts (Table 7).

Maine has been the second-highest ranking groundfish revenue landing state every year from 2007-2015, but the groundfish revenue trends for Maine differ from those observed with Massachusetts. Starting in 2007, revenues decreased by $5.8 million (-57.4%) to a nine-year low of $4.3 million in 2010. Since 2011, groundfish revenues for Maine have fluctuated, but 2015 represents the lowest point since 2010 and the second lowest in the nine-year period. Because the vast majority of groundfish landed in Maine is landed in Portland, similar groundfish revenue trends have occurred in that port compared to the state as a whole (Table 7).

Other landing states represent, in general, an increasingly smaller portion of total groundfish revenue throughout the 2007-2015 time period. New Hampshire was the third-ranked state in aggregate groundfish revenue over 2007-2015, but the $0.6 million in revenue for the state in 2015 represents an 82.4% (-$2.8 million) decline since 2007 and the lowest value in the nine-year period. New Hampshire experienced decreases in groundfish revenue every year since 2011. Rhode Island was the fourth-ranked state in aggregate groundfish revenue from 2007-2015, though was ranked third in each year from 2013-2015. Following declines in 2008 and 2009, groundfish revenues in Rhode Island have consistently remained around $2.0 million annually. The vast majority of groundfish landed in Rhode Island is landed in Point Judith, and therefore trends in groundfish revenue for Point Judith drive groundfish revenue trends for the state as a whole. Connecticut, New Jersey, New York, and other states in the northeast typically experience small amounts of groundfish landings revenue. As an aggregate, these states had <$1.0 million in annual groundfish revenue from 2009-2015 (Table 7).

The distribution of groundfish revenue by home port state (Table 8) is similar to that seen by landing state in many cases (Table 7). Many of the groundfish revenue trends are also similar between landing port and home port. Massachusetts was the top groundfish revenue-earning state by home port from 2007-2015, but experienced its four lowest revenue years from 2012-2015. Groundfish revenues earned by vessels homeported in Massachusetts have fallen by $21.3 million (-35.9%) from 2007-2015. The four largest groundfish home ports in Massachusetts all saw nine-year lows during these most recent years as well. Overall percentage declines in groundfish revenues from 2007-2015 for these four Massachusetts home ports ranged from 18.8% (Boston) to 82.8% (Chatham). Home port groundfish revenue in Massachusetts tended to be lower than the state's landing port revenue. Maine, the second highest-ranked state in terms of groundfish value by home port, saw minor changes in the early part of the time series, but experienced declines since 2011 for an overall decline of -$5.8 million (-40.8%) from 2007-2015. Maine tended to have higher groundfish revenue as a home port state than landing port state, and this is especially evident in the early part of the time series. New Hampshire, the third-ranked state by aggregate groundfish revenue by home port over 2007-2015, has experienced a similar downward trend seen in the state's groundfish revenue by landing port, with a decline of $3.5 million (-71.4%) in groundfish revenues for vessels homeported in the state. Rhode Island, the fourth-ranked home port over the nine-year period, followed a similar trend to that of its groundfish revenue by landing port. Among the lower groundfish revenue states by home port, New York generally experienced relatively minor year-to-year fluctuations since 2009, and Connecticut had groundfish revenue no greater than $0.2 million annually since 2009. New Jersey experienced a nine-year low in groundfish revenue of <$0.1 million as a home port during 2015 (Table 8).

2.2.2. Revenues by Species

The top groundfish species by annual revenue from 2007-2012 was cod (Table 9). In 2013 pollock was the top revenue species, while in 2014 and 2015 haddock sales earned the most revenue. Cod was by far the highest revenue-generating species aggregated over the nine-year period, and redfish was the lowest (Table 9).

In terms of increasing groundfish species revenue trends, redfish is the clearest example, though plaice revenue has also increased moderately from 2007 to 2015. Revenue from both of these species reached a nine-year high in 2015, and redfish had only one year (2013) where revenue decreased from the previous year. Plaice revenue reached $5.0 million for the first time in 2015, after remaining between $4.1 and $4.8 million during the previous eight years. White hake revenue was higher in 2015 than 2007, but revenue decreased every year from 2012-2015. In recent years, haddock has had a generally positive revenue trend, following a nine-year low in 2012 (Table 9).

While the majority of allocated groundfish species exhibited negative trends in revenue during the 2007-2015 period, cod stands out as a particularly strong example. Revenue from cod decreased every year from 2011-2015, and the declines in 2012 from 2011 (-$14.1 million; -46.5%) and again in 2013 from 2012 (-$7.2 million; -44.4%) were especially sharp. During every year from 2007-2011, revenue from cod accounted for over 30% of total groundfish revenue. In 2015, when cod revenue hit a nine-year low, only 12.4% of groundfish revenue was from cod. Pollock and witch flounder revenue were also at nine-year lows in 2015. Revenue for both pollock and witch flounder decreased every year from 2011-2015. Revenue for winter flounder and yellowtail flounder were at their second-lowest levels in 2015 across the nine-year period.

Winter flounder and yellowtail flounder revenue have been on a generally declining trend, with 2007 being the nine-year high for both species (Table 9).

The top non-groundfish revenue species landed by the limited access groundfish fleet in every year from 2007-2015 was sea scallops (Table 10). Lobster was the second-highest non-groundfish species in each of these years. Many of the top non-groundfish species do not show clear revenue trends across 2007-2015. Sea scallop revenue reached a nine-year high in 2012, but decreased the following two years to a nine-year low in 2014. Scallop revenue then rebounded in 2015, with an increase of $13.9 million (+24.5%) from 2014. Lobster revenue generally decreased over the early portion of the nine-year period and increased in the later part. Lobster revenue in 2015 is very close to that seen in 2007. Loligo squid and scup revenue reached nine-year highs in 2015, and loligo squid saw one of the longest sustained periods of annual increases in revenue (2009-2013) among non-groundfish species during the nine-year period. Compared to the other nine non-groundfish species, loligo squid also experienced the largest increase in revenue, both in absolute (+$10.2 million) and percentage (+43.0%) terms, from 2007 to 2015. Atlantic herring revenue was at its highest values during the final three years of the time series (Table 10).

In terms of decreasing revenue trends for non-groundfish species, anglerfish (monkfish) annual revenue was at lower values during 2013-2015 compared to 2007-2012. Anglerfish revenue did, however, increase slightly in 2014 and 2015. Revenue from skates was at a nine-year low in 2015, though 2014 skate revenue was higher than seen in 2010-2013 (Table 10).

2.3. Prices

Trends in average groundfish and non-groundfish prices are presented in Table 1 and Figure 1. Price trends for the nine allocated groundfish species are presented in Figure 2. All prices are presented in real terms (constant 2010 dollars) to adjust for inflation. The average price of the nine allocated groundfish species (as a group) trended downward, with the price falling from $1.43/lb. in 2010 to $1.23/lb. in 2015. The 2015 price marks the second lowest since 2007; average groundfish price was at a nine-year low of $1.21/lb. in 2009. Among sector vessels, the average groundfish price also trended downwards since 2010, reaching a low of $1.22/lb. in 2015. Average groundfish price generally exhibited an increasing trend for common pool vessels, with the 2015 price of $1.74/lb. being the highest since 2010. The average price of all non-groundfish species (as a group) was $1.15/lb. in 2015, a $0.14/lb. increase over 2014, and its highest value since 2010 and second highest value since 2007 (Table 1).

At the species level, witch flounder has most frequently yielded the highest ex-vessel price (2007-2010 and 2013-2015), and the 2014 witch flounder price ($2.47/lb.) was the highest single-species price in a given year since 2007. Cod yielded the highest price in 2011-2012, and the second highest price in 2013-2014. Winter flounder has frequently been among the highest-priced groundfish species, having been one of the top three species in most years over the 2007-2015 period. Redfish was the lowest-price species in 2008-2015, and all other groundfish species had average prices at least twice that of redfish during 2013-2015. Pollock yielded the lowest price of all groundfish species in 2007 (Figure 2).

In terms of price trends by species, the price of pollock increased every year from 2007-2014, other than 2011. Prices then decreased slightly in 2015, but were still at the second-highest level since 2007. Despite the generally increasing price trend for pollock, the species had the

second lowest groundfish price from 2008-2015, ahead of redfish. White hake followed a similar price trend to pollock, with white hake also yielding a nine-year high in price during 2014 before slightly decreasing in 2015. Cod and haddock both experienced downward trends in price since 2012, resulting in the 2015 average cod price ($1.87/lb.) and the 2015 average haddock price ($1.15/lb.) being at their lowest levels since 2009. Yellowtail flounder and plaice prices were variable during 2007-2015, with no obvious upward or downward trend (Figure 2).

Using simple average nominal prices of all groundfish species combined to compare changes in prices over time may be misleading because this average does not account for annual changes in the quantity and mix of groundfish species landed. A price index was therefore constructed to more accurately reflect price trends of groundfish species. The approach used the "Fisher Ideal" index (Balk 2008), which was constructed from price and quantity data recorded in dealer purchases of all groundfish species. Quarterly data was used in all fishing years from 2007 through 2015. May-July (quarter one) of 2007 was set as the base period, with a value of 1.0.

The index values (Figure 3) show how combined nominal prices have changed in relation to quarter one 2007 nominal prices. A value less than one means that prices are lower compared to the base time period, while a value greater than one indicates that prices have increased relative to quarter one in 2007. Compared to 2007 quarter 1, all values were greater than one in 2014 and 2015, indicating higher prices relative to the base time period. Generally, the price index showed similar trends in fishing years 2013-2015. The peak index value occurred in quarter 3 in 2013, 2014 and 2015, which corresponds to the months of November, December and January. Prices in the 3rd quarter of 2013 were higher than in 2014 and 2015, and 2015 was slightly lower than 2014. In all three years, the index was between 1.2 and 1.4, indicating relative price stability. Since implementation of the catch share system (2010 Q1), the price index has stayed between 1.2 and 1.4 in 14 out of 24 quarters (Figure 3).

3. NUMBER OF VESSELS AND EFFORT

Effort indicators provide information about the amount of fishing activity that took place in a fishing year in order to produce that year's landings. This report uses four variables as indicators of fishing activity and fishing effort: number of active vessels; number of trips taken; number of days absent from port; and average trip length. In a given fishing year, "active vessels" in the limited access groundfish fleet are defined as vessels with a limited access groundfish permit that received revenue from any species. Conversely, "inactive vessels" refer to vessels with a limited access groundfish permit which did not have any landings of any species in a given fishing year.

3.1. Number of Vessels

The total number of groundfish limited access eligibilities declined annually from 2007 to 2015, hitting a nine-year low of 1,358 eligibilities in 2015 (Table 11). The number of vessels with revenue from any species from any trip, as well as the number of vessels with landings of allocated groundfish from at least one groundfish trip, also declined annually during this time period, dropping to nine-year lows in 2015. The number of active vessels in the limited access groundfish fleet fell from a high of 1,039 vessels in 2007 to a low of 678 vessels in 2015 (-34.7%), while the number of vessels with allocated groundfish landings from at least one

groundfish trip fell from 596 vessels in 2007 to 269 vessels in 2015 (-54.9%). The greatest annual decrease in the number of vessels with revenue from any species occurred between 2010 and 2011 (-76 vessels), while the greatest annual decrease in the number of vessels with allocated groundfish landings from at least one groundfish trip occurred between 2009 and 2010 (-127 vessels). Not only did the absolute number of vessels with allocated groundfish landings decrease from 2007 to 2015, but the percentage of vessels with allocated groundfish landings also declined during this period. In 2007, 39.3% of vessels with a limited access groundfish permit had allocated groundfish landings from at least one groundfish trip; this number fell to 27.2% in 2015 (Table 11).

While the absolute number of inactive vessels with limited access groundfish permits declined overall from 2007 to 2015, the percentage of vessels with limited access groundfish permits that were inactive remained relatively stable throughout this time period. In 2007, there were 479 inactive vessels with limited access groundfish permits. After increasing to 526 vessels in 2010, the number of inactive vessels with limited access groundfish permits fell to a nine-year low of 312 inactive vessels in 2015 (-34.9% from 2007). The percentage of vessels with limited access groundfish permits that were inactive fluctuated throughout this same period, increasing from a low of 32% in 2007 to a high of 39% in 2011, then returning back to a low of 32% in 2014 and 2015 (Table 11).

Both the absolute number and the percentage of groundfish limited access eligibilities held in CPH rose between 2007 and 2015, with the largest absolute annual increase occurring between 2010 and 2011. In 2007, there were 75 groundfish limited access eligibilities (4.4% of total eligibilities) held in CPH. By 2015, there were 369 eligibilities (27.2% of total eligibilities) held in CPH, a 392.0 % increase in the number of groundfish limited access eligibilities held in CPH from 2007 (Table 11).

Care should be taken when interpreting the reduction of active vessels in the groundfish fleet. Amendment 16 implemented a number of measures that induced the fishery toward fewer active vessels without necessarily requiring owners of non-active vessels to leave the fishery entirely. For example, Amendment 16 made it possible for an owner with multiple groundfish permitted vessels to consolidate operations on to fewer vessels in order to reduce operational costs. In addition, Amendment 16 allows owners of permits held in CPH, which are not associated with an actual fishing vessel, to participate in sectors (i.e., allows the owner of permits in CPH to contribute the landings history for permits in CPH as PSC toward a sector's yearly allocation of ACE). Alternatively, if the eligibility in CPH is in the common pool, the holder of that eligibility can lease DAS to other vessels, with some restrictions. Therefore, while it is clear that fewer vessels within the groundfish fleet are earning revenue from landing allocated groundfish on groundfish trips, and it is clear that the number of vessels actively fishing under a limited access groundfish permit has decreased, we cannot conclude that all owners of all inactive vessels are no longer involved in the fishery in some way. Some of these owners may still be earning revenue by leasing out PSC/ACE or DAS, while others may have chosen to direct their fishing effort into a different fishery. Still others have chosen to leave commercial fishing completely.

3.1.1. Number of Active Vessels by Home Port

The number of active vessels with revenue from any species decreased across all home port states from 2007 to 2015 (Table 12). Overall declines from 2007-2015 in number of active vessels with revenue from any species ranged from 6.3% (-1 active vessel) in Connecticut, to

55.0% (-33 active vessels) in New Hampshire. All other northeast home port states combined also experienced a 15.9% decline in active vessels with revenue from any species from 2007 to 2015. In terms of absolute change, Massachusetts lost the greatest number of active vessels, with 189 fewer active vessels in 2015 compared to 2007. The number of active vessels with revenue from any species remained relatively stable in Connecticut, which had 16 active vessels in 2007 and 15 active vessels in 2015. The home port states of Massachusetts, New Hampshire, and Rhode Island did not see an increase in number of active vessels with revenue from any species in any year from 2007 to 2015 (Table 12).

The six largest groundfish home ports saw a decline in number of active vessels with revenue from any species from 2007 to 2015. Decreases over the nine-year period ranged from 17.9% (-10 vessels) in Point Judith, to 42.9% (-9 vessels) in Portland. Gloucester saw the most dramatic decrease in terms of absolute change, with 46 fewer active vessels in 2015 compared to 2007 (-39.0%). The number of active vessels with revenue from any species either decreased or remained the same from the previous year every year in five of the six largest home ports. The exception was Point Judith in 2015, with three more active vessels than in 2014 (Table 12).

The number of active vessels with revenue from at least one groundfish trip also fell across all home port states between 2007 and 2015 (Table 13). The largest annual decrease in the number of active vessels with revenue from at least one groundfish trip occurred between 2009 and 2010, with 127 fewer active vessels in 2010 compared to 2009. Decreases from 2007 to 2015 in the number of active vessels with revenue from at least one groundfish trip ranged from 22.2% (-2 active vessels) for Connecticut, to 93.6% (-44 active vessels) for New Jersey. In terms of absolute change, Massachusetts lost the most active vessels with revenue from at least one groundfish trip during this time period. The number of active vessels with revenue from at least one groundfish trip home ported in Massachusetts declined annually, resulting in an overall decrease of active 188 vessels from 2007 to 2015 (-55.0%) (Table 13).

The number of active vessels with revenue from at least one groundfish trip generally declined across all six major home ports from 2007 to 2015, with Gloucester, New Bedford, and Portland all hitting nine-year lows in 2015. The remaining three major home ports, Boston, Chatham, and Point Judith, reached nine-year lows in number of active vessels with revenue from at least one groundfish trip in 2014. For these six top ports, changes during 2007-2015 in the number of active vessels with revenue from at least one groundfish trip ranged from 23.8% (-10 vessels) for Point Judith, to 55.4% (-31 vessels) for Boston. Gloucester experienced the greatest decrease in number of active vessels in absolute terms, with 48 fewer vessels having revenue from at least one groundfish trip in 2015 compared to 2007 (Table 13).

3.1.2. Number of Active Vessels by Vessel Size

The number of active vessels with revenue from any species was at a nine-year low for the limited access groundfish fleet as a whole in 2015 (Figure 4). When divided by size class, decreases in number of active vessels from 2007 to 2015 ranged from 20.6% (-27 vessels) for the 75’ and above size class, to 44.0% (-33 vessels) for the less than 30’ size class. In terms of absolute declines, the size class that experienced the largest drop in number of active vessels with revenue from any species was the 30’ to < 50’ length class, which had 208 fewer vessels in 2015 compared to 2007. Despite small annual increases in number of active vessels in the less than 30’ size class (+ 7 vessels in 2009, + 3 vessels in 2013), the number of active vessels still declined overall for this smallest length class from 2007 – 2015. Additionally, the 50’ to < 75’

size class also experienced an overall decline in number of active vessels during this nine year period (Figure 4).

The number of active vessels with revenue from at least one groundfish trip was also at a nine-year low for vessels in all size classes in 2015 (Figure 5). Decreases from 2007-2015 in the number of active vessels with revenue from at least one groundfish trip ranged from 41.0% (-32 vessels) for the 75' and above size class, to 65.1% (-233 vessels) in the 30' to < 50' size class. The decline of 233 vessels taking groundfish trips over 2007-2015 in the 30' to < 50' length class was the largest drop in absolute terms among vessel class sizes. Despite some small annual increases in number of active vessels with revenue from at least one groundfish trip (2009 for the less than 30' length class, 2011 and 2015 for the 75' and above length class), the number of active vessels still declined overall throughout the time period. One particularly striking comparison is that the number of vessels in the 30' to < 50' size class with revenue from at least one groundfish trip in 2007 (358 vessels), 2008 (340 vessels), and 2009 (313 vessels) was higher than the total number of vessels with revenue from at least one groundfish trip remaining in the fleet in 2014 (310 vessels) and 2015 (280 vessels) (Figure 5).

3.2. Number of Trips, Days Absent, and Trip Length

In order to evaluate vessel activity patterns during 2007 - 2015, VTR data pertaining to number of fishing trips, days absent from port, and average trip length were analyzed, both in the aggregate and across vessel size classes (Table 14).[18] Effort by the limited access groundfish fleet on groundfish trips generally decreased between 2007 and 2015, with the number of groundfish trips taken and the number of days absent on groundfish trips both hitting nine-year lows in 2015. However, when groundfish trips were taken, they were longer in length during the later years of the 2007-2015 time period than they were in the earlier years for all vessel class sizes except the <30' class size. The limited access groundfish fleet took 8,453 groundfish trips in 2015, a 69.1% decrease from the 27,320 groundfish trips taken in 2007. As a whole, the fleet spent 15,144 days absent on groundfish trips in 2015, a 46.8% decrease from the 28,466 days the fleet spent absent on groundfish trips in 2007. The biggest annual change in effort occurred between 2009 and 2010, when the number of groundfish trips dropped from 26,223 in 2009 to 13,536 in 2010 (-48.4%), and the number of days absent on groundfish trips dropped from 25,071 to 18,525 (-26.1%). While the number of groundfish trips and the number of days absent on groundfish trips both decreased from 2007 to 2015, the average trip length of groundfish trips taken by the fleet increased during this time period, from 1.05 days in 2007 to a nine-year high of 1.79 days in 2015. The largest annual change in average groundfish trip length occurred between 2009 and 2010, when average trip length increased by almost half a day (+0.41 days) (Table 14).

Each individual vessel size class experienced overall reductions in the number of groundfish trips taken and the number of days absent on groundfish trips during this time series. In terms of both percent and absolute change, vessels in the 30' to < 50'size class saw the

[18]For some trips, trip length could not be calculated due to missing values for sail and landing dates in the VTR data for the trip. In this case, the sail and landing dates from AMS data were used to determine the trip length when possible. For trips where the resulting trip length value was either zero or negative, trip length was set at 1 day. For cases where the resulting trip length was $\geq$ 31 days, trip length was treated as missing. Finally, in cases where trip length could not be determined because sailing and landing dates were not available from either the VTR or AMS data, the value of trip length was treated as missing. Thus, the average trip length values provided in this report may differ from those obtained by dividing the overall number of days absent by the overall number of trips listed in this report for both groundfish and non-groundfish trips.

greatest decline in number of groundfish trips (74.0%; 18,476 to 4,800 trips) taken and number of days absent on groundfish trips (62.2%; 9,774 to 3,699 days) from 2007 to 2015. Vessels in the smallest length class took 41.8% fewer groundfish trips (-110 trips) and spent 47.8% fewer days absent on groundfish trips (-48 days) in 2015 compared to 2007, even after increasing from lows of 101 groundfish trips in 2010 and 41 days absent on groundfish trips in 2013. In 2015, number of days absent on groundfish trips decreased to nine-year lows for vessels in the two largest size classes. In 2015, vessels in the 50' to < 75' size class spent 5,306 days absent on groundfish trips, which is 6,071 fewer days absent compared to 2007 (-53.4%). Vessels in the 75' and above size class spent 6,087 days absent on groundfish trips in 2015, a decline from 7,215 days absent on groundfish trips in 2007 (-15.6%) (Table 14).

From 2007 to 2015, average groundfish trip length increased for vessels in the 30' to < 50', 50' to < 75', and 75' and above size classes. In terms of percent change, vessels in the 30 to < 50' experienced the greatest increase in average groundfish trip length from 2007 to 2015. Average groundfish trip length for vessels in the 30' to <50' size class was 0.53 days in 2007; this rose to a high of 0.77 days in 2015 (+45.3%). Vessels in the 50' to < 75' size class had an average groundfish trip length of 2.11 days in 2015, a 30.3% increase from 1.62 days in 2007. Average groundfish trip length for vessels in the largest size class (75' and above) increased from a low of 5.09 days in 2007 to 6.15 days in 2015 (+20.8%). Only vessels in the smallest size class experienced an overall decrease in average groundfish trip length during this time series, falling from 0.39 days in 2007 to 0.34 days in 2015 (-8.6%) (Table 14).

Effort on non-groundfish trips by the limited access groundfish fleet also generally decreased during 2007-2015, though not as dramatically as effort on groundfish trips. The number of non-groundfish trips taken by the fleet fell to a nine-year low of 32,009 trips in 2015, an 18.8% decrease from 39,400 non-groundfish trips in 2007. Number of days absent on non-groundfish trips also decreased overall from 2007 to 2015, dropping from 32,462 days in 2007 to 28,810 days in 2015 (-11.3%). The greatest annual decrease occurred between 2010 and 2011, when the number of non-groundfish trips taken fell from 38,667 trips in 2010 to 33,862 trips in 2011 (-12.4%), and the number of days absent on non-groundfish trips fell from 31,405 in 2010 to 28,040 in 2011 (-10.7%). Average length of non-groundfish trips for the groundfish fleet was at its second highest value in the time series in 2015, with an overall 2.2% increase from 0.91 days in 2007 to 0.93 days in 2015 (Table 14).

Vessels in the less than 30' size class took fewer non-groundfish trips and had fewer days absent on non-groundfish trips in 2015 than they did in 2007, despite an uptick in both of these effort indicators after they decreased to nine-year lows in 2012. Overall, compared to 2007, vessels in this length category took 21.7% fewer non-groundfish trips in 2015 and had 21.0% fewer days absent on non-groundfish trips in 2015. The average length of non-groundfish trips for vessels in this size class also displayed a slight decline during this time series, falling from 0.36 days per trip in 2007 to 0.33 days per trip in 2015 (Table 14).

Vessels in the 30' to < 50' size class experienced a similar overall decrease in effort indicators for non-groundfish trips during the 2007 – 2015 time series. There were several upticks in number of non-groundfish trips taken and number of days absent on non-groundfish trips during 2009 – 2010 and 2012 – 2014. However, vessels in this size class took 17.1% fewer non-groundfish trips (-4,258 trips) and spent 13.9% fewer days absent on non-groundfish trips (-1,354 days) in 2015 than they did in 2007. Vessels in the 30' to < 50' size class also experienced a slight overall decrease in average trip length on non-groundfish trips from 2007-2015. Average

non-groundfish trip length for vessels in this size category was 0.45 days/trip in 2007; by 2015, the average trip length decreased to 0.43 days/trip (Table 14).

Vessels 50' to < 75' took 2,189 fewer non-groundfish trips (-21.4%; 10,239 to 8,050 trips) in 2015 than they did in 2007. However, unlike other length classes, vessels in this length class spent slightly more days absent on non-groundfish trips in 2015 than they did in 2007. After falling to a nine-year low of 11,611 days in 2014, in 2015 the number of days absent on non-groundfish trips by vessels in the 50' to < 75' size class increased to 12,542 days (+5 days from 2007). From 2007-2015, the average trip length of non-groundfish trips generally increased for this size class, rising from 1.28 days/trip in 2007 to a nine-year high of 1.57 days/trip (+22.7%) in 2015. Vessels in the 50' to < 75' vessel size class were the only ones to experience an aggregate increase in average length of non-groundfish trips over the nine-year period (Table 14).

In terms of percent change, vessels in the largest size class, 75' and above, saw the greatest overall decline in number of non-groundfish trips (-23.0%, -579 trips) taken and number of days absent on non-groundfish trips (-22.7%, 2,191 days) from 2007 to 2015. Over the course of the time series, the average trip length of non-groundfish trips also generally became shorter for vessels 75' and above. Vessels in the 75' and above size class had an average trip length of 4.05 days on non-groundfish trips in 2007; this decreased to an average of 3.90 days in 2015 (-3.7%). Vessels in this largest size class experienced a nine-year low average non-groundfish trip length of 3.54 days in 2008 (Table 14).

4. ECONOMIC PERFORMANCE

A complete assessment of fishery economic performance requires information from all vessels on all fishing-related costs and on all fishing-related revenues to determine profits. Actual annual financial profit is the sum of the owner's share of net revenue (i.e., gross revenue less trip-related costs) for all trips made over a year less annual fixed costs.[19] One of these pieces of required information is the cost of purchasing additional ACE or DAS or the revenue from selling any excess. While some information on ACE purchase cost is available, information about the sellers of ACE is incomplete. There are also data limitations concerning fixed costs and crew payments.[20] Due to these data limitations, the Social Sciences Branch (SSB) does not have sufficient information to estimate profitability for various segments of the groundfish fleet or at a finer level (e.g., at the vessel affiliation or the individual vessel level).

[19] Fixed costs are typically those that do not vary with the amount of fishing effort (as do trip-related costs). These costs include, but are not limited to, expenses such as insurance, principal and interest payments on business loans, office and business vehicle expenses.

[20] Fixed cost and crew payment data were collected through a voluntary survey in 2006-2008. However, vessel owner response to that fixed cost survey was poor. In 2012, SSB implemented a redesigned cost survey to collect information about fixed costs and crew payments incurred in 2011 from approximately 50% of the commercial fishing vessel owners in the Northeast, according to vessel size and primary gear type. The survey was repeated in 2013, surveying the remaining half of vessel owners in the Northeast for fixed costs and crew payments incurred in 2012. The 2012 and 2013 surveys resulted in higher response rates than the 2006-2008 efforts, with response rates of 30% and 21%, respectively. The SSB now has fixed cost and crew payment data for 741 commercial fishing vessels in the Northeast. For more detailed information on the 2012 and 2013 surveys see Das (2016). The fixed cost survey was repeated in 2016 for costs incurred by commercial fishing businesses in 2015, though these data have yet to be analyzed. Both the Northeast Fishery Observer Program (NEFOP) and the At-Sea Monitors (ASM) Program collect some of fishing-related trip costs, and these data can be used to evaluate financial performance. Information contained in VTR and dealer data can also be used to derive additional performance measures.

This report uses three metrics to evaluate financial performance: (1) revenue per vessel and day; (2) total factor productivity, and (3) net revenue. None of these measures alone provides a complete assessment, but taken together they allow insights into important aspects of economic performance and provide some indication of trends in the economic efficiency of the active groundfish fleet.

4.1. Revenue per Vessel

Landings revenue per unit of effort was used as a proxy measure for profitability. Profitability is often measured as the ratio of total revenue divided by total cost, with a ratio greater than one indicating positive profits. Because a complete accounting of costs is not available, effort is used as a proxy for cost. If the costs of inputs used to generate effort are constant, comparing the ratio of revenue per unit of effort in two time periods serves as a proxy for profitability change. With constant input prices and revenue, an increase in effort would increase costs, reducing the revenue per unit effort ratio, and imply reduced profitability between the two time periods. Conversely, increased revenue with constant (or lower) effort would imply an increase in profitability. However, even with constant effort, the costs of inputs used to generate effort could be increasing.

The gross revenue per effort metrics used in this report characterize the performance of an average vessel within each vessel size category. However, individual vessel performance can vary substantially, in either direction, from the average. As stated above, changes in gross revenue per unit effort can also be accompanied by changes in the use (and therefore the cost) of inputs.[21] These caveats should be considered when evaluating the results that follow.

The number of active vessels that received revenue from at least one groundfish trip generally declined across all vessel size classes from 2007 to 2015 (Table 15). In 2015, the count of such vessels was at a nine-year low for the <30', 30' to <50', and 50' to <75' vessels. For vessels 75' and above, the number of active vessels with revenue from any species on a groundfish trip was at a nine-year low in 2014 before increasing by one vessel in 2015. There was a noticeable drop in active groundfish vessels across size classes in 2010, the first year of widespread sector management. Trends for average total gross revenue among vessels on groundfish trips vary by vessel size class. Vessels in the smallest size class (less than 30') saw a nine-year high in average total gross revenue on groundfish trips in 2015 ($7.0K), after hitting a nine-year low in 2013 ($1.5K). For vessels 30' to <50', the two lowest years for average total gross revenue on groundfish trips were 2013 ($100.3K) and 2015 ($105.1K), indicating a downward trend. Among vessels 50' to <75', average total gross revenue on groundfish trips in most years was around $250K, with exceptions in 2010 ($294.3K) and 2011 ($346.1K). For the largest size class, 75' and above, average total gross revenue on groundfish trips was higher during 2010-2015 than during 2007-2009. However, since 2010, no clear trend in revenue is evident (Table 15).

The number of active vessels that received revenue from at least one non-groundfish trip also displayed a declining trend across vessel size classes. In 2015, the count of such vessels was at a nine-year low for all vessel size classes, except for the 50' to <75' class, which reached its low in 2013 (154 vessels). Average total gross revenue for vessels on non-groundfish trips showed a generally positive trend for all size classes. In 2015, the less than 30' and 50' to <75'

[21] For example, the amount of fuel used could increase because of a change in fishing behavior that may generate an increase in revenue per day absent.

size classes saw nine-year highs in average total gross revenue on non-groundfish trips. The 30' to <50' size class experienced a nine-year high in average total gross revenue on non-groundfish trips in 2014 before slightly decreasing in 2015. Vessels in the 75' and above size class saw the highest average total gross revenue on non-groundfish trips in 2012, though the 2015 average total gross revenue was only slightly lower (Table 15).

4.2. Fleet Productivity

Productivity and productivity change are key economic indicators, and critical factors in economic growth. With a single output and single input, productivity is typically measured as the ratio of output produced to the input used. With a more complicated production process, productivity is measured as aggregate output divided by aggregate input, and is called Total Factor Productivity (TFP). TFP is the most general measure of productivity, and changes in TFP can be measured at the firm level or at the aggregate industry level.

Fishing vessels typically catch multiple species on a trip using multiple inputs. For example, vessels use labor (crew), capital stock (vessel length and horsepower), and energy (fuel) on fishing trips to harvest a variety of fish and shellfish species. Due to this multiple output, multiple-input fishing technology, index numbers which combine outputs and inputs into a single number and compare those totals with a base year or time period total are necessary to measure TFP change.

A recent national effort estimated productivity change for all catch share fisheries in the United States, including the northeast multispecies fishery, using the Lowe index. Productivity change was defined as the ratio of a Lowe output quantity index to a Lowe input quantity index. The Lowe output and input quantity indices are aggregate values of total outputs produced, and total inputs used to produce the outputs, with both indices constructed using fixed prices. The index is constructed at the fishery level.

For the northeast multispecies fishery, the Lowe output index was constructed using the value of all species landed on groundfish trips (Table 16). The Lowe input index is the aggregate value of capital services, labor services, fuel and materials used on all groundfish trips. The base year for the indices is 2007. A value greater than one for the Lowe index indicates an improvement in productivity, while a value less than one signifies a decline in productivity, compared to 2007. A final point is that these numbers have not been adjusted to account for changes in biomass which may have occurred.

In 2014, productivity rose two percent from 2013 levels (0.98 vs. 0.96), and then increased again by six percent in 2015 (1.04 vs 0.98). The overall index in 2015 was 1.04 which indicated higher productivity than in 2007, and was the third straight year of productivity gain. However, productivity gains were largely due to further reductions in input usage. In 2015, the input index was half of that in 2007 (0.5 vs. 1.0). The decline in inputs was caused in part by an exit of vessels (Table 16).

In 2014, the output index declined to a low of 0.53, meaning outputs were nearly half 2007 levels (0.53 vs. 1). The index remained at this level in 2015, which was also a low for the time series. Between 2010 and 2012, the Lowe Index decreased, as the output index declined more than the input index. After 2012, the input index declined more than the output index, resulting in positive yearly productivity change. In terms of the overall index, productivity gains from 2013 onward were positive and the overall Lowe index was greater in 2015 than in the base year (1.04 vs. 1; Table 16).

5. ACE LEASING

Every limited access groundfish permit has a potential sector contribution (PSC) based on its fishing history during the qualifying years of 1996-2006. The PSC is a percentage share of the total allocation for each allocated groundfish stock. Every limited access groundfish permit also has a tracking identification number called a Moratorium Right Identifier (MRI). PSC is technically allocated to MRIs, which are subsequently linked to vessels through Northeast Multispecies limited access fishing permits. When permit holders join a sector, their PSC is pooled and becomes the sector's annual catch entitlement (ACE). Each sector determines how to distribute its ACE among its members. All allocated groundfish caught on sector fishing trips count toward that sector's ACE. ACE is transferable between sectors via approved leases, while PSC is transferable within sectors using lease arrangements.

ACE and PSC are generally leased in because one fisherman or sector wishes to catch more than their initial allocation for a particular stock. It is important to note that some sectors or fishermen may choose to lease out most or all of their ACE/PSC rather than catch it. Traditional definitions of economic rationality[22] suggest that if a fisherman chooses to lease out quota for a stock or set of stocks, it is because they perceive the benefits from leasing the quota (the leasing revenues he or she would receive) outweigh the expected benefits from using the quota to harvest fish. Conversely, if a fisherman chooses to lease in quota for a particular stock or set of stocks, it is presumed that they perceive the expected benefits, through increased fishing opportunities, from leasing in the quota to exceed the combined costs of leasing and additional operational costs. It is important to note that the revenues to be gained from harvesting a portion of ACE may consist of not only revenues earned from landing the stock for which the leased quota is held, but possibly revenues that may accrue from other stocks the fisherman is able to land only because he has leased in ACE for a particular constraining stock. For example, if a fisherman has harvested all of his own quota for GOM cod and cannot catch haddock in the Gulf of Maine without catching some GOM cod, he may lease in ACE for GOM cod to allow him to continue to fish for haddock. In this case, the expected benefits of leasing in quota for GOM cod are the revenues from landing that GOM cod and the revenues from landing all other fish the GOM cod quota allows him to harvest (including revenues from haddock), less the costs associated with harvesting the fish associated with that portion of the GOM cod quota, including leasing costs. ACE is often transferred in order to achieve an optimal balance of species/stocks since many species/stocks are caught jointly.

ACE and PSC leases result in transfer payments within the industry. If there are no transaction costs—that is, no costs associated with these transfers[23]—the payments are not a cost to the industry. However, at the individual vessel or vessel affiliation level, leasing costs and leasing revenues can have important distributional consequences among commercial fishermen. Every pound of ACE or PSC leased represents a cost to the lessee and a reimbursement to the lessor, both of whom are industry members or, in some cases, permit banks. A frictionless lease market[24] allows industry members to better align their allocated PSC portfolio with their actual

[22] In economics, rationality is a concept about how individuals make choices. Although economic definitions of rationality can differ slightly, the basic concept of rational choice is that individuals will make the choices that yield them the greatest benefit or utility.

[23] Transaction costs include, for example, payments to a broker, the cost associated with finding buyers or sellers, or the opportunity costs associated with leases that didn't happen due to poor market information or other factors.

[24] A lease market with no transaction costs.

catch. However, the benefits of leasing decrease as transaction costs increase: imperfect information on lease quantities and prices, for example, may cause fishermen to hold PSC when they should lease, or vice versa. Other structural aspects of the sector system such as operating rules that require multiple rights-of-refusal within sectors and between affiliated sectors may increase transaction costs, decreasing market liquidity and reducing efficiency in the leasing market. This section evaluates how ACE and PSC moved within and between sectors during 2010-2015 with an emphasis on market structure and size, prices, total transfers, and transaction costs.

5.1. Market Structure, Size, and Characteristics

There are two forms of leasing: ACE leases between sectors and PSC leases between members of the same sector. Although by regulation ACE is pooled within sectors, most sectors seem to follow the practice of assigning catch allowances to member vessels based on the vessel owner's PSC allocations. An individual that wishes to catch more of a groundfish stock than their initial PSC allocation would be required to lease either ACE (between-sector) or PSC (within-sector).[25]

Between-sector leases are formally reported to NMFS, noting the stock, total weight, and often, but not always, compensation. Catch and individual allocation data at the MRI level can be combined with between-sector lease data to estimate the size of these two components of the leasing market. Within-sector PSC leases are not tracked by NMFS; ACE is assigned to a sector with no restrictions on how and by whom it may be fished. However, sectors are asked to voluntarily report their within sector trades in reports submitted to NMFS at the end of each fishing year. Sectors also voluntarily report which sector members transfer quota out of the sector and which sector members receive quota from another sector. Not all sectors report these within and between sector trades in the same fashion. Within-sector PSC leases data were reported voluntarily for the first time in 2012. However, these data are not uniformly traceable to the individual permit or MRI level. Many sector members own multiple vessels but the data do not distinguish which permits were responsible for leasing quota in or out. In addition, fishing permits can be associated with different MRIs due to ownership changes and other reasons. Fishing permits can move in and out of CPH status.[26] This further complicates associating vessels with actual quota trades.

One way of approximating how many sector-affiliated MRIs leased in PSC in a fishing year is to look at how many MRIs had catch that exceeded their total PSC allocations for at least one stock in that year. Presumably, additional PSC would have needed to be leased in by that MRI in order to cover this overage. The number of sector-affiliated MRIs with catch that exceeded individual PSC allocations for at least one stock has declined every year since 2010, reaching a low of 194 MRIs in 2015 (Table 17). These MRIs leased in 23.9 million live pounds of ACE and/or PSC in 2015, the highest amount since 2011 (31.3 million live lbs.). MRIs associated with the homeport of Gloucester leased in more ACE/PSC in 2015 (4.1 million live

[25] ACE carryover from one fishing year to the next is allocated to sectors and the method of re-allocation within a sector is not reported. This analysis assumed that the total amount of sector-level carryover was re-allocated to individual sector members proportional to their unused PSC from the prior year.

[26] CPH provides a temporary holding place for inactive permits while allowing the fishing history (and ultimately the quota) to be used on another permit.

pounds) than they did during any year from 2010-2014, despite the total number of MRIs associated with Gloucester that leased in being at a low in 2015 (36 MRIs) (Table 17).

At the vessel affiliation level,[27] 150 affiliations leased in 18.1 million live pounds in 2015 (Table 18). The difference between the total live pounds leased in at the MRI level in Table 17 (23.9 million live lbs.) and the total live pounds leased in at the vessel affiliation level in Table 18 (18.1 million live lbs.) is 5.8 million live pounds; this represents the amount of quota leased between MRIs within the same vessel affiliation. Some vessel affiliations consist of a single owner with multiple MRIs and these "leases" are transfers of ACE from one MRI to another. The volume of groundfish leased in by vessel affiliations in 2015 was at its highest level over the 2010-2015 period, and the increase from 2014 was 7.5 million lbs. (+70.8%). Vessel affiliations in the home port state of Massachusetts leased in more quota in 2010-2015 than any other home port state, and those vessel affiliations associated with the homeport of Boston leased in more ACE/PSC in 2015 than any year from 2010-2014 (Table 18).

The number of MRIs leasing in quota declined overall from 2010 to 2015 (-67 MRIs, -25.7%), and this decline affected all four vessel size categories (Table 19). In the smallest size category, vessels less than 30', the number of MRIs leasing in quota ranged from 2 MRIs in 2010 to 6 MRIs in 2011, with no MRIs in this size category leasing in quota in 2015. The number of MRIs leasing in quota in the 30' to <50' size category has decreased nearly every year since 2010, with an overall decline of 49 MRIs (38.9%) from 2010-2015. In the 50' to <75' size category, the number of MRIs leasing in quota remained stable between 73 and 78 during 2010-2015. In the largest size category, 75'+, the number of MRIs leasing in was close to constant during 2010-2012 before decreasing to a low of 40 MRIs in 2013. In 2014 and 2015, the number of MRIs leasing in this size category slightly increased (Table 19).

While identifying fishermen and/or ownership groups that lease in ACE/PSC can be determined by comparing catch with allocated PSC at the MRI level, it is more challenging to identify the group of fishermen leasing out some or all of their allocated ACE/PSC. Fishermen who failed to convert their allocated PSC into catch may be easily identified, but these permits create a pool of potential ACE/PSC that is much larger than aggregate lessee requirements[28] (Table 20). Further, many active fishermen chose to lease ACE/PSC for particular stocks while targeting others, so those with zero catch are not the sole source of unharvested ACE/PSC. Some broad conclusions about utilization and transfers of ACE/PSC among vessels in different size categories can be reached (Table 21). For example, in every year from 2010-2015, vessels in the 75' and above size category land around 50.0% of the total groundfish catch, but are only allocated 30-37% of aggregate groundfish ACE in a given year. Conversely, vessels in the smallest size category (less than 30') land 0.0-1.0% of total annual groundfish catch, but are allocated 14-24% of ACE. These numbers likely indicate leasing of ACE/PSC from the smallest to the largest vessels. The share of annual catch attributed to vessels in the 30' to <50' size category fell from 18% in 2010 to 8% in 2015, despite only minor fluctuations in the share of ACE allocated to vessels size category over time. For vessels in the 50' to <75' size category, the share of annual catch has increased from 30% in 2010 to 37% in 2015, despite once again, limited change in the share of allocated ACE for this size category (Table 21).

[27] Vessel affiliations are groups of vessels connected by common ownership. Note that these data may not be comprehensive, as vessel affiliation data are not currently collected on CPH permits.

[28] "Aggregate lessee requirements" refers to the total number of live pounds of ACE/PSC that were leased in during each fishing year.

In 2015, the inter-sector (between-sector) lease market was at its second lowest volume (14.0 million lbs.) since 2010, but increased by 4.1 million lbs. (+41.4%) from 2014. The highest volume of inter-sector leases occurred in 2012 at 21.5 million lbs. (Table 22).

5.2. Prices

In order to estimate lease values for all 17 stocks of leased ACE during 2010-2015, a hedonic price model was used to analyze price and quantity data for the between-sector component of the market (Table 23 and Table 24).[29] In 2015, there were 984 leases with compensation details reported (Table 23). Of these leases, 666 were validated[30] and used in the hedonic price model (Table 24). Statistically significant prices[31] were estimated for 9 of the 17 groundfish stocks in 2015: WGB cod; GOM cod; GOM haddock; plaice; pollock; white hake; SNE/MA winter flounder; witch flounder; and CC/GOM yellowtail flounder (Table 24). In 2015, six of the 17 groundfish stocks were traded at a price not statistically different than zero: EGB cod; redfish; GB winter flounder; GOM winter flounder; SNE/MA winter flounder; and SNE/MA yellowtail flounder (Table 24).[32] This is the highest proportion of stocks traded at a price no different than zero during the entire 2010-2015 period. Model results show that GOM cod reached the highest lease price of any stock in 2015, with an average lease value of $2.29 per live pound. This represents the second highest annual average lease value obtained for any stock throughout 2010-2015; the highest annual average value during this period was $2.47 per live pound for EGB cod in 2012 (Table 24). For reference, Table 25 contains weighted mean price estimates from single-stock lease data only. Results from these calculations also indicate that the highest average lease value for any stock in 2015 was attributed to GOM cod ($2.80 per live pound) (Table 25).

Table 26 contains information pertaining to ex-vessel prices and estimated ACE lease prices per live pound of the 17 allocated groundfish stocks. In 2015, the ex-vessel price was higher than the ACE lease price for every stock except GOM cod. For this stock, the ACE lease price exceeded the ex-vessel price by $0.17 per live pound (Table 26). A higher ACE lease price to ex-vessel price ratio for certain stocks may indicate that fishermen pay to lease this stock in order to continue targeting other stocks which occur in the same area. For example, fishermen

[29] ACE leases between sectors take three forms: (1) single-stock leases with single-value cash compensation (single stock leases); (2) multi-stock leases with single-value cash compensation (bundled leases); and (3) single or multi-stock leases with single or multi-stock compensation (swap leases). This model decomposes the lease arrangements into constituent parts representing the 17 individual stocks, where a price (P) is a function of various quantities of the 17 stocks for which ACE is traded. The specification of the model is $P = \beta_0 + \beta_1\chi_1 + \ldots + \beta_n\chi_n + \varepsilon$. The weights, β, are the portion of the total price (P) attributable to each quantity of ACE stock leased (x) and represent the marginal price of ACE lease. In this case n is the seventeenth ACE stock. Additional variables were added to estimate the contribution of bundled and swap leases, as well as the effects on prices for ACE leased by Northeast Fishery Sector IV, a lease-only sector, and state permit banks. To include swap leases in the model, price was set at zero dollars and one side of the swap recorded negative lease quantities while the other recorded positive quantities. By using swap, bundle, and single-stock lease data, it is possible to provide a comprehensive estimate of ACE lease values.

[30] Leases were validated in the case of fish-for-cash trades if positive compensation values were reported. Leases were validated in the case of stock swaps if the estimated lease prices lay within two standard deviations of the fish-for-cash price estimates.

[31] Prices that are statistically significantly different from $0.

[32] This could be because the quota were truly valueless (likely the case for the GB haddock stocks) or because data were insufficient to allow the model to estimate a non-zero price.

may pay to lease additional GOM cod PSC in order to continue to actively target other GOM stocks.

Prices based only on one portion of the lease market (between sector ACE leases vs. within sector leases) may be biased due to structural issues affecting the lease market. Most sectors maintain rights of first refusal when a sector member wishes to lease ACE out of the sector, and the Northeast Fishery Sectors maintain an additional second-refusal right for all members of their affiliated sectors. These structures create frictions in the market by concentrating liquidity into small pools before opening the market to all participants. The impact of this on lease prices is uncertain. Within-sector markets may clear at lower prices than between-sector markets, in this case estimates based on between-sector transactions would be biased upward. At the same time, the large pool of available ACE for most stocks should be sufficient to meet leasing demand, which, at least in theory, should erode any between-sector price premium. Permit banks and similar privately funded ACE leasing organizations may choose to lease ACE at below market rates, which might create an additional upward bias on the price estimates. These leases typically take place within sectors, and therefore the proportion of total ACE leased out by such entities is unknown. Such lease arrangements are not factored into price estimates reported here since no data are available for them.

5.3. Transfer Payments

At the MRI level, the total value of ACE/PSC lease market transfers in 2015 is estimated at $5.5 million. This represents a 10.0% increase (+$0.5 million) from 2014, but a 53.8% decrease (-$6.4 million) from the estimated 2010 transfer payment value (Table 27). Total estimated transfer payments hit their lowest value in 2013 ($4.4 million) and peaked in 2011 ($15.5 million). Overall, the total live pounds of ACE fishermen needed to lease in in each year remained fairly stable through the 2010-2015 period, ranging from a low of 21.0 million live lbs. in 2013 to a high of 31.3 million live lbs. in 2011. Both total transfer payments and total pounds leased in peaked in 2011 and dropped to lows in 2013, which suggests that annual changes in total transfer payment value are due in part to annual changes in the volume of ACE leased. However, it is important to note that variability in total transfer payment values also stems in part from changes in the mix of stocks required annually by fishermen. For example, in 2015, fishermen leased in 5.6 million live lbs. of WGB haddock and 6.2 million live lbs. of redfish. In 2015 both of these stocks traded at prices no different than $0.00, so these large lease volumes did not contribute to total transfer payments that year.

When collapsed to the vessel affiliation level, the total value of ACE/PSC lease market transfers is estimated at $4.5 million in 2015. This represents a 36.4% increase (+$1.2 million) from 2014, but a 34.8% decrease (-$2.4 million) from 2010 (Table 28). Of the 17 stocks examined in 2015, GOM cod obtained the highest average lease price at both the MRI ($2.29/live pound) and vessel affiliation ($2.29/live pound) levels (Table 27 and Table 28, respectively). American plaice obtained the highest estimated transfer payment value at both the MRI ($2.4 million) and vessel affiliation ($2.0 million) level in 2015 (Table 27 and Table 28, respectively). Transfer payments for plaice may be high in value because this stock has a fairly high utilization rate, and it is also frequently encountered by vessels fishing in the Gulf of Maine and on Georges Bank.

A comparison of the total number of transfer payments between MRIs and between vessel affiliations implies that, in 2015, approximately 77.3% of total transfer payments (81.8%

of all leasing by value) occurred between distinct vessel affiliations (Table 29). The proportion of leases conducted within and between vessel affiliations varies at the home port and home port state level. For example, in 2015, a larger percentage of transfers among vessels home ported in New Hampshire occurred between vessels in different affiliations (90.0%) than was the case for vessels home ported in Massachusetts (69.4%) (Table 29).

5.4. Transactions Costs

The transfers described thus far do not represent a cost to the industry as a whole. Any costs associated with ACE and PSC leasing result from two primary sources: the direct costs of getting buyers (fishermen that lease ACE/PSC in) and sellers (fishermen that lease ACE/PSC out) to negotiate lease prices and quantities and the indirect costs associated with leases that would have made both buyers and sellers better off but did not happen. Together, these are considered transaction costs.

It was not possible to estimate the value of transaction costs for three reasons. The first is a structural impediment. The fact that ACE is held at the sector level but leases almost universally occur at the individual permit (MRI) and/or vessel affiliation level means that lease market data are opaque, leaving only the buyer side of the transaction, or the fishermen that need to lease ACE/PSC in, obviously discernible from official NOAA records. Second, while most sectors included some perspective on some forms of transaction costs in their annual reports, no comprehensive data are available on all of the costs associated with orchestrating leases between individuals, firms, or sectors. Such costs may include fees paid to sector managers or brokers, costs associated with advertising ACE availability, or the cost of time spent searching for and completing suitable leases. The third and final reason for being unable to estimate transaction costs is that no data are available on which to base estimates for the cost of lost leasing opportunities,[33] the largest form of transaction cost in this market. Primarily these lost opportunities are due to search frictions and/or structural market impediments that prevent or impair lease negotiation. That is to say, it is not possible to estimate which fishermen or vessel affiliations wanted to lease quota but could not and what the impact of any inability to match buyers and sellers may have been on the potential for increasing the catch of non-binding stocks.

During each year from 2010-2015, less than 50% of total allocated ACE/PSC was caught. The highest aggregate utilization rate occurred in 2011 (42.0%) and the lowest aggregate utilization rate occurred in 2012 (32.1%). In 2015, 8 out of 17 allocated groundfish stocks had utilization rates below 50% (Table 30). At first glance, this would seem to imply that there may be potential for efficiency gains from improving lease markets. However, the inability of sectors to catch their allocated ACE is not likely attributable to any one factor. For example, it may be due to search frictions and/or structural impediments, but it may also be due to fish availability and/or imperfect quota setting, insufficient technology to target particular stocks, expectations about future market conditions, or other factors altogether. The 35.4% overall utilization rate in 2015 represents a 3.5% decrease from 2014 (Table 30).

In 3 out of 6 years, there was at least one stock which had a 100% utilization rate. Plaice is the only groundfish stock that has had utilization rates >90% in multiple years (2013-2015). However, there are a number of other groundfish stocks that generally have high utilization rates. CC/GOM yellowtail flounder, for example, had utilization rates >80% each year other than 2014.

[33] Leases that would have left those leasing in and those leasing out better off had they occurred.

Witch flounder had utilization rates >80% in 2010 and 2013-2015. Western GB cod also had four years with >80% utilization rates (2010, 2013-2015), as did GOM cod (2010, 2011, 2013, 2015) (Table 30).

6. DISTRIBUTIONAL ISSUES

Considerable attention has been given to consolidation in the groundfish fishery, and whether the degree of consolidation has been affected by Amendment 16. There is concern also that consolidation may generate a loss of diversity in the commercial groundfish fishery. The term "consolidation" can be used to refer to many possible events including the following: a reduction in the number of vessel affiliations (i.e., ownership groups), a reduction in the number of active vessels, a narrower range of vessel sizes, or fewer landed or home ports. To avoid confusion, this report uses the term "consolidation" to mean fewer active vessels or fewer active vessel affiliations earning total revenues from all species combined and from groundfish. In discussing how revenues from all species combined and revenue from groundfish alone are distributed among existing active vessels and active vessel owners in a given fishing year, we use the term "concentration" An increase in concentration of revenues from one time period to another indicates that revenues are relatively less equally distributed than they were in the earlier time period.

It is important to note that this section addresses the consolidation and concentration of total gross revenue from all species and total groundfish revenues from landings by active vessels and vessel affiliations, which are earned through *use* of the fishery resource. This section does not address concentration and consolidation of quota or permits, which allows for *access* to the fishery resource. An individual or ownership group may not be actively landing fish, which means that they would not earn a share of the landings revenues discussed in this section. However, they may still be earning revenues from leasing quota to individuals or ownership groups that are actively fishing, and those leasing revenues are not reflected in the discussion in this section.

6.1. Number of Vessel Affiliations

Changes in the number of vessel affiliations in the commercial groundfish fishery, or networks of vessels connected by common owners, do not necessarily mean there are more or fewer individuals involved in the fishery. Changes in groundfish vessels' ownership structures among existing individuals may also result in changes in the number of vessel affiliations. The results in Figure 6 reflect the combination of these two possibilities.

The total number of vessel affiliations with limited access groundfish permits declined steadily during 2007-2015, dropping from 982 vessel affiliations in 2007 to 715 affiliations (-27.2%) in 2015. The largest annual decline in number of vessel affiliations with limited access groundfish permits occurred between 2010 and 2011 (-64 affiliations). While the absolute number of active vessel affiliations (i.e., vessel affiliations with revenue from any species) also declined continually from 2007 to 2015, the percentage of vessel affiliations that were active in each fishing year remained relatively stable, ranging between 75.2%-80.4% in each fishing year.

The number of vessel affiliations with limited access groundfish permits that had revenue from at least one groundfish trip also declined annually from 2007 to 2015, falling from 485 vessel affiliations in 2007 to 240 vessel affiliations (-50.5%) in 2015. The largest annual decline

in number of vessel affiliations with revenue from at least one groundfish trip occurred between 2009 and 2010 (-88 affiliations). Compared to the percentage of vessel affiliations with limited access groundfish permits that had revenue from any species, the percentage of vessel affiliations with limited access groundfish permits that had revenue from at least one groundfish trip declined more sharply during the time series. In 2007, just under half (49.4%) of all vessel affiliations with limited access permits had revenue from at least one groundfish trip; by 2015, vessels affiliations with revenue from at least one groundfish trip accounted for 33.6% of all vessel affiliations with limited access groundfish permits (Figure 6). This reflects trends observed in the number of active vessels (see Section 3.1.); from 2007-2015, the number of vessels with landings of allocated groundfish from at least one groundfish trip declined more rapidly than the number of vessels with revenue from any species (Table 11).

The number of vessel affiliations with limited access groundfish permits that were inactive (i.e., had no landings) fluctuated throughout the nine-year period from 2007 to 2015, but declined overall in absolute terms from 193 affiliations in 2007 to 158 affiliations in 2015 (-18.1%). The percentage of total vessel affiliations holding limited access groundfish permits that did not earn revenue from harvesting any species increased from 19.7% in 2007 to 22.1% in 2015. The largest absolute number of inactive vessel affiliations occurred in 2010 (212 inactive affiliations), while the highest percentage of inactive vessel affiliations occurred in 2011 (24.8% of all vessel affiliations with limited access groundfish permits) (Figure 6).

The fact that over time, both the number and percentage of vessel affiliations with revenue from at least one groundfish trip have decreased implies that consolidation of vessel affiliations that actively target groundfish has occurred. Data presented in (Figure 6) shows that the proportion of active vessel affiliations with limited access groundfish permits that had revenue from at least one groundfish trip declined during 2007-2015, dropping from 61.5% in 2007 to 43.1% in 2015. Data presented in Table 31 suggests that consolidation of active vessel affiliations over time has not resulted in a greater number of active vessels per affiliation. Overall, the percentage of vessel affiliations containing a single active vessel versus the percentage of those containing multiple active vessels have remained relatively stable during 2007-2015. The percentage of vessel affiliations with a single active vessel in 2015 was 87.4% (487 affiliations), a slight increase from 84.2% (664 affiliations) in 2007. The average number of active vessels per vessel affiliation also remained fairly consistent during 2007-2015, falling from 1.32 in 2007 to 1.22 in 2015 (-7.6%) (Table 31). This information suggests that the decline in active vessel affiliations from 2007-2015 is primarily driven by the attrition of active vessel affiliations (i.e. fewer ownership groups), in addition to some consolidation of fishing operations within vessel affiliations.

6.2. Distribution of Revenue among Vessels

The active limited access groundfish fleet has consolidated at the vessel level during 2007-2015; there are fewer active vessels earning revenues from the harvesting of fish. While both the total number of active vessels and the number of active vessels with revenue from at least one groundfish trip declined overall from 2007-2015, the number of active vessels targeting groundfish declined more sharply than the total number of active vessels with revenue from any species (Figure 6). During the same time span, revenue from both all species combined and revenues from groundfish saw an overall decline (Table 32 and Table 33). To examine how revenue from all species and how groundfish revenues were distributed amongst those vessels

remaining active during each year from 2007-2015, the active vessels in each year were ranked from highest to lowest according to their revenue for that year. Once ranked, these vessels were binned into 6 earnings brackets, from highest to lowest: top 1%; > 1% to 20%; > 20% to 40%; > 40% to 60%; > 60% to 80%; and > 80% to 100%. This was done for both revenue from all species on all trips (Table 32) and groundfish revenue on all trips (Table 33).

Revenue from all species combined was not evenly distributed among active commercial groundfish vessels between 2007 and 2015 (Table 32). Throughout this time series, revenue from all species was concentrated among top earning vessels. The percentage of total gross revenue earned by the top 1% of vessels remained fairly stable, ranging from 5.5%-6.8% annually, and was at a nine-year low in 2015. Similarly, the percentage of revenue from all species attributed to the top 20% of vessels also remained fairly stable, ranging from 59.2%-64.4% annually during 2007-2015, with 60.5% of total gross revenues earned by the top 20% of vessels in 2015. During this time series, little change occurred in the proportional share of the bottom 20% of vessels (the > 80% to 100% earnings bracket) for total gross revenue, with this bracket accounting for 0.5%-0.8% of total gross revenue annually. In 2015, the bottom 20% of vessels earned 0.6% of total gross revenues (Table 32). Compared to revenue from all species combined, groundfish revenue was more heavily concentrated among the top earning vessels during 2007 – 2015 (Table 33).

The top-earning vessels in the groundfish fishery generally had lower groundfish revenue in absolute terms in more recent years coinciding with overall declines in total groundfish revenues during 2007-2015. However, the share of total groundfish revenue these top-earning vessels received generally increased during this time series. The percentage of groundfish revenue attributed to the top 1% of vessels remained relatively stable during 2007-2015, ranging from 8.0%-10.6% annually. The nine-year low of 8.0% occurred in 2013 and the nine-year high of 10.6% occurred in 2015. There was more variation in the share of groundfish revenue earned by the top 20% of vessels; it rose by 14.9% overall from 2007 to 2015, from a nine-year low of 64.5% in 2007 to 79.5% in 2015. The nine-year high of 80.3% occurred in 2013. During this time series, little change occurred in the proportional share of the bottom 20% of vessels for groundfish revenue, with vessels in this bracket accounting for 0.0%-0.1% of groundfish revenues; the annual amount of groundfish revenue earned by this group remained nearly constant at $0.0 – $0.1 million (Table 33).

6.3. Distribution of Revenue among Vessel Affiliations

The distributions of revenues from both all species combined and from groundfish alone are more concentrated at the vessel affiliation (ownership) level than at the vessel level. From 2007 to 2015, both the total number of active vessel affiliations and the total amount of gross revenue in the fleet declined overall, with the total number of active vessel affiliations in the fleet hitting a nine-year low in 2015 and the total amount of revenue from all species hitting a nine-year low in 2014. In order to examine distributions of revenue among vessel affiliations from 2007-2015, active vessel affiliations were ranked from highest to lowest according to their annual revenue. Once ranked, these vessel affiliations were binned into 6 earnings brackets, from highest to lowest: top 1%; > 1% to 20%; > 20% to 40%; > 40% to 60%; > 60% to 80%; and > 80% to 100%. This was done for both revenue from all species combined on all trips (Table 34) and groundfish revenue on all trips (Table 35).

Revenue from all species was not distributed equally among vessel affiliations from 2007 to 2015, with the majority (67.6%-72.3% annually) of total gross revenue concentrated among

the top 20% earning vessel affiliations (Table 34). Throughout the 2007-2015 time series, the percentage of total gross revenue earned by the top 1% of vessel affiliations showed an overall slight decline, dropping from 19.5% in 2007 to 16.8% in 2015. However, the percentage of total gross revenue attributed to the top 20% of vessel affiliations showed a slight overall increase across this same time series, rising from 70.0% in 2007 to 72.1% in 2015. From 2007 to 2015, little change occurred in the proportional share of the bottom 20% of vessel affiliations for total gross revenues, with affiliations in this bracket accounting for 0.4%-0.6% of total gross revenue (Table 34).

As was the case at the vessel level, groundfish revenue is more concentrated among the top earning vessel affiliations than revenue from all species combined, and during 2007-2015, groundfish revenue became more concentrated toward top-earning vessel affiliations (Table 35). The top-earning vessel affiliations in the groundfish fishery generally had lower groundfish revenue in absolute terms in more recent years due to overall declines in total groundfish revenues during 2007-2015. Groundfish revenue earned by the top 1% of vessel affiliations dropped to a nine-year low in 2013, while the amount of groundfish revenue earned by the top 20% of vessel affiliations hit a low in 2015. However, the share of total groundfish revenue these top-earning vessel affiliations received generally increased throughout this time series. In 2007, 25.4% of total groundfish revenue for the fleet was earned by the top 1% of vessel affiliations; in 2015, 30.7% of total groundfish revenue was earned by the top 1% of vessel affiliations. From 2007 to 2015, the percentage of groundfish revenue earned by the top 20% of vessel affiliations also increased from a low of 74.4% in 2007 to 87.8% in 2015, with a nine-year high of 89.1% in 2013. During this time series, the percentage of total groundfish revenue attributed to the bottom 20% of vessel affiliations showed a general decline, with affiliations in this bracket earning 0.1% of total groundfish revenue in 2007-2009 (about $0.1 million each year) and < 0.1% in 2010-2015 (Table 35).

In addition, to examine distributions of total revenue among vessel affiliations from 2007-2015, vessel affiliations with at least one active vessel in each fishing year were divided into eight revenue categories based on their earnings from all species combined in that fishing year (Figure 7). The smallest revenue category included affiliations earning less than $50,000 for all trips and from all landed species. The highest revenue category included affiliations earning $1 million or more for all trips and all landed species. As noted in Section 6.1., the total number of vessel affiliations with active vessels declined annually between 2007 and 2015 (Figure 6). From 2007 to 2015, declines in the number of vessel affiliations with active vessels occurred in seven of the eight total revenue categories. The only revenue category that experienced an overall increase in number of vessel affiliations with active vessels was the $1 million or more category, which rose from 68 vessel affiliations in 2007 to 75 vessel affiliations in 2015 (+10.3%).

6.4. Consolidation and Concentration of Revenue among Vessel Affiliations

Another way to analyze how revenue is distributed throughout the limited access groundfish fishery is to evaluate the number of vessel affiliations that earn various shares of overall revenue in each fishing year. When fewer vessel affiliations earn revenue from all species combined and/or from groundfish alone, this indicates that consolidation has occurred. For each year from 2007 to 2015, active vessel affiliations were binned into revenue quartiles based on

that year's earnings, and the number of vessel affiliations accounting for the top 25%, 50%, 75%, and 100% of the revenue from all species on all trips (Table 36) and groundfish on all trips (Table 37) were calculated annually. In order to assess whether changes in the concentration of revenue have occurred, annual changes in the *proportion* of vessel affiliations in each revenue quartile were examined, adjusting for annual changes in the total number of vessel affiliations.

Table 36 shows that from 2007 to 2015, the number of ownership groups earning revenue from all species combined on all trips decreased overall, indicating that fewer vessel affiliations are actively fishing under limited access groundfish permits and that consolidation of total gross revenue has occurred. The number of vessel affiliations with revenue from all species declined annually throughout this time series, dropping from a high of 789 vessel affiliations in 2007 to a low of 557 vessel affiliations in 2015 (-29.4%). There was also a general decline in the number of vessel affiliations in each individual revenue quartile of revenue from all species (top 25%, 50%, and 75%) from 2007 to 2015. For example, the number of vessel affiliations earning the top 25% of revenue from all species decreased by 23.1% (-3 vessel affiliations) from 2007 to 2015. Despite these declines in the absolute number of vessel affiliations earning revenue from all species, the percentages of vessel affiliations earning the top 25%, 50%, and 75% of revenue from all species remained relatively stable from 2007 to 2015 (Table 36).

Between 2007 and 2015, the total number of vessel affiliations with revenue from groundfish declined overall, indicating that consolidation of groundfish revenue occurred (Table 37). The number of vessel affiliations with groundfish revenue declined steadily between 2007 and 2015, falling from a high of 485 vessel affiliations in 2007 to a low of 240 vessel affiliations in 2015 (-50.5%). The number of vessel affiliations in each earnings group (top 50%, 75%, and 100%) also decreased overall during this nine-year period. In 2007, 7.0% of vessel affiliations (34 vessel affiliations) earned the top 50% of total groundfish revenue. The percentage of vessel affiliations earning the top 75% of groundfish revenues fell nearly every year, reaching a nine-year low of 9.6% in 2015. This indicates that over time, the absolute number of vessel affiliations earning groundfish revenue has declined, and the distribution of groundfish revenue among remaining active vessel affiliations has shifted (Table 37).

Taken together, Table 36 and Table 37 show that there are fewer vessel affiliations remaining in the limited access groundfish fishery in 2015 compared to 2007. Therefore, in 2015, revenue from all species combined and revenue from groundfish is being divided amongst fewer ownership groups than in 2007. The distributions of revenues among vessel affiliations indicate that groundfish revenue is more concentrated among top earning vessel affiliations than revenue from all species. This is reflective of trends observed in the distribution of revenue from all species and revenue from groundfish among active vessels discussed in Section 6.2.

6.5. Distribution of Revenue Using Lorenz Curves and Gini Coefficients

Lorenz curves provide a graphical interpretation of how revenue is dispersed among the income levels of a population.[34] For any given point on the Lorenz curve, the vertical axis value is the share of total revenue accounted for by all vessels that earned revenue equal to or less than the proportion of the population indicated by the horizontal axis value. The Gini coefficient can

[34] A Lorenz curve is constructed by ranking vessels in order of increasing revenue and then plotting the cumulative proportion of the population on the horizontal axis versus the cumulative share of revenue on the vertical axis.

be derived from the Lorenz curve and reflects the degree of deviation between the Lorenz curve and the 45 degree line that represents perfect equality.[35] Gini coefficient values are bounded by 0 and 1, where 0 indicates perfect equality and 1 indicates maximum inequality.

The Lorenz curves for the distribution of groundfish revenue among vessel affiliations show three distinct periods (Figure 8). The Gini coefficients for each three-year period are presented below the Lorenz curves. While groundfish revenue was not equally distributed at any time period during 2007-2015, groundfish revenue was the most evenly distributed among vessel affiliations in 2007-2009 (Gini value = 0.744), relative to other periods in the time series. Groundfish revenue was less evenly distributed among vessel affiliations during 2010-2012 (Gini value = 0.815), and least evenly distributed among vessel affiliations during 2013-2015 (Gini value = 0.846) (Figure 8).

The Gini values for total gross revenue and groundfish revenue at the vessel affiliation level during each of the nine years from 2007-2015 are presented in Table 38. The values for groundfish revenue support the fact that the years contained within each three-year period in Figure 8 have a similar distribution of revenue (e.g. 2014=0.848 and 2015=0.843). In terms of total gross revenue by vessel affiliations, the Gini values do not show the same trend as seen with groundfish revenue (Table 38). In other words, the clear change in the concentration of groundfish revenue in more recent years (2013-2015) compared to less recent years (2007-2009) is not reflected in total gross revenue from all species combined. As the change in concentration for total gross revenue over the time series is minor, the Lorenz graphical representation is not meaningful and therefore is not presented in this report.[36]

7. EMPLOYMENT

Changes in employment levels can result from changes in fishery regulations. The implementation of new fisheries management schemes, such as catch shares, can impact employment through vessel consolidation, changes in working conditions (i.e., pay, time at sea, number of jobs), and reductions in fishing effort. Although there is no system in place to track employment data in the groundfish fishery, Vessel Trip Reports (VTRs) contain information pertaining to crew size and trip duration that can be used to assess certain employment indicators. While VTRs do not identify the actual number of individuals employed on a vessel, data pertaining to crew size can indicate the number of positions available to be filled on fishing trips, and data pertaining to amount of time at sea (number of trips and/or days) can indicate the availability of earning opportunities within the fleet.

There was an overall negative trend in employment indicators in the period from 2007 to 2015, suggesting that both positions on vessels and opportunities for earning on vessels holding a limited access groundfish permit decreased across vessel size classes and home port states. Across the fleet, crew positions and crew trips fell to nine-year lows in 2015. Crew days were at a nine-year low in 2014, but increased by 1.4% in 2015. Additionally, the ratio of crew days to crew trips reached nine-year highs in 2015, suggesting that more time was spent per earning opportunity, while earning opportunities were simultaneously declining.

[35] The Gini coefficient is equal to twice the area between the diagonal and the Lorenz curve.

[36] The Gini values for total gross revenue in each fishing year are not far apart so the Lorenz curves overlap one-another, making it impossible to distinguish one year from another.

7.1. Number of Crew Positions

The number of crew positions available in a fishery can be used as an indicator for the availability of employment opportunities within that fishery. To calculate the total annual number of crew positions in the fleet, we begin by obtaining the average crew size for each active vessel for all trips taken in the given year. Average crew sizes are then summed across all vessels to obtain the total number of crew positions in the fleet. In addition, total annual number of crew positions are broken down by vessel size category (Table 39) and home port state (Table 40).

The total number of crew positions in the limited access groundfish fleet decreased annually from 2007 to 2015, falling from 2,696 positions in 2007 to a nine-year low of 1,913 positions in 2015 (-29.0%). The largest annual decline in number of crew positions occurred between 2009 and 2010 (-170 positions). During this time series, the total number of crew positions showed an overall decline across all vessel size classes. Decreases in number of crew positions ranged from 15.6% (-93 positions) for the largest (75' and above) size class, to 46.7% (-49 positions) for the smallest (less than 30') size class. Number of crew positions in the less than 30', 30' to < 50', and 50' to < 75' size classes were at nine-year lows in 2015, while number of crew positions in the largest size class hit a nine-year low in 2014 and increased by 1 position in 2015 (Table 39).

Most home port states also saw declines in total crew positions from 2007 to 2015. By home port state, decreases in crew positions ranged from 7.7% (-13 positions) in New Jersey, to 54.0% (-67 positions) in New Hampshire. Massachusetts lost the greatest number of crew positions over 2007-2015 in absolute terms, 463 crew positions. Cumulatively, other northeast home port states also experienced an overall 6.4% decrease in number of crew positions (-10 crew positions) from 2007-2015. In 2015, number of crew positions was at a nine-year low for the home port states of Massachusetts, Maine, New Hampshire, New York, and Rhode Island. New Jersey saw a low of 145 crew positions in 2011; in 2015, the number of crew positions on vessels homeported in New Jersey was 157. Connecticut was the only home port state that experienced a general increase in number of crew positions from 2007 to 2015. After dropping to a nine-year low of 35 positions in 2008, number of crew positions in Connecticut rose to a high of 50 positions in 2015, a 6.4% increase from 2007 (Table 40).

7.2. Number of Crew Trips

While the number of crew positions is indicative of the availability of jobs within a fishery, this indicator does not tell much about the actual work opportunities for these individuals.[37] In order to glean more information about this, the crew trip indicator is used. As most fishing crew are paid on a per-trip basis, crew trip provides a measure of total earning opportunities for crew. For each fishing year, total crew trips were calculated by summing the crew size of all trips taken in that year across both vessel size category (Table 39) and home port state (Table 40).

The total number of crew trips taken by the limited access groundfish fleet was at its nine year high in 2007 (156,432 crew trips) and declined in most years, except for a slight uptick between 2008 (150,112 crew trips) and 2009 (150,520 crew trips). Overall, the number of crew

[37] For example, a vessel with three crew members that makes 10 trips a year is considered equivalent (with respect to crew positions) to a vessel with three crew members that makes 60 trips per year.

trips dropped from 156,432 trips in 2007 to a nine-year low of 100,438 trips in 2015 (-35.8% overall). The largest annual decrease in both absolute number and percentage of crew trips taken for the fleet as a whole occurred between 2009 and 2010, when the total number of crew trips taken dropped from 150,520 to 124,436 (-26,084 trips, -17.3%). Vessels in each size class saw general declines in number of crew trips taken between 2007 and 2015, with decreases ranging from 14.5% (-417 trips) for vessels less than 30', to 39.0% (-34,791 trips) for vessels 30' to < 50'. In 2015, total crew trips fell to a nine-year low for vessels in the 30' to < 50' size class. Vessels in the 50' to < 75'and 75' and above size classes experienced nine-year lows in total number of crew trips taken in 2014. Despite the fact that total number of crew trips increased annually following a nine-year low of 2,108 trips in 2012, vessels in the smallest size class also experienced an overall decline in number of crew trips taken from 2007 to 2015 (Table 39).

Vessels in each major home port state experienced general declines in total number of crew trips taken from 2007 to 2015, ranging from 9.2% (-218 trips) in Connecticut to 57.1% (-5,654 trips) in New Hampshire. In absolute terms, the home port state of Massachusetts experienced the greatest reduction in total number of crew trips taken during this time series, taking 29,637 (-40.4%) fewer crew trips in 2015 compared to 2007. The number of crew trips taken by vessels home-ported in Maine, New Hampshire, New York, and Rhode Island all hit nine-year lows in 2015. Vessels with home ports in New Hampshire and New York experienced brief upticks in number of crew trips taken during 2008-2009, but saw overall declines throughout the remainder of the time series. Although Connecticut experienced an overall decrease in crew trips taken from 2007-2015, the number of crew trips taken by vessels homeported there did increase in 2014 and 2015, with 2015 marking the second highest number of crew trips (2,150) over the nine-year period. Cumulatively, vessels in the other northeast homeport states saw an overall increase in total number of crew trips taken from 2007 to 2015. After rising to a nine-year high in 2008 and subsequently dropping to a nine-year low in 2014, vessels in the other northeast home port states ended up taking 2.3% (+92 trips) more crew trips in 2015 than they did in 2007 (Table 40).

7.3. Number of Crew Days

Crew days, which are calculated by multiplying a trip's crew size by the days absent from port, were summed across vessel size categories (Table 39) and home port states (Table 40) to provide additional information about the time crew spend at sea per earning opportunity in each fishing year. The time spent at sea has an opportunity cost. For example, if crew trips and crew earnings remain constant, a decline in crew days would reveal a benefit to crew in that less time was forgone for the same amount of earnings. The ratio of crew days to crew trips accounts for these factors. The absolute value of this ratio does not, in itself, provide information about opportunities for crew. In addition, changes in the ratio do not indicate an increase or decrease in revenues earned per trip. Annual changes in the ratio are informative in observing trends in time spent per earning opportunity (a crew trip). For example, a declining trend in the ratio would imply a reduction in time spent per earning opportunity.

Total crew days for all vessel size classes decreased 23.5% (-47,112 days) from 2007 to 2015, with the largest annual decline in total number of crew days occurring between 2009 and 2010 (-9.8%; -18,528 crew days). Additionally, during this period, the number of crew trips decreased more rapidly than the number of crew days. Therefore, from 2007 to 2015, the ratio of crew days to crew trips increased for the fleet as a whole. In 2007, the ratio of crew days/crew

trips was 1.28; in 2015, it rose to 1.53 crew days/crew trip (+19.2%). This suggests that between 2007 and 2015, crew working on vessels with limited access groundfish permits spent more time per earning opportunity, while the overall number of earning opportunities decreased (Table 39).

Every vessel size class showed a general decline in total number of crew days from 2007 to 2015. By size class, reductions in number of crew days ranged from 13.4% (-127 crew days) for vessels less than 30', to 34.8% (-15,077 crew days) for vessels 30' to < 50'. In absolute terms, vessels in the 50' to < 75' size class experienced the largest decrease in total number of crew days, falling from 78,968 crew days in 2007 to 62,341 crew days (-16,627 days) in 2015. Vessels in the two largest length classes experienced nine-year lows in crew days in 2014, while vessels in the 30' to < 50' size class experienced a low in 2015. Total crew days for vessels in the less than 30' size category hit a nine-year low in 2012, increasing annually in the three subsequent years. In terms of time spent per earning opportunity, vessels in every size class except less than 30' experienced an increase in the ratio of crew days/crew trips from 2007-2015. The largest increase, both in percentage and absolute terms, occurred in the 50' to < 75' size class (+23.1%; +0.38 crew days/crew trip). For vessels in the smallest size class, the ratio of crew days/crew trips was the same in 2015 as it was in 2007 (0.33 crew days/crew trip; Table 39).

All home port states saw general declines in total number of crew days from 2007 to 2015. In percentage terms, decreases in total number of crew days ranged from 16.0% (-1,954 crew days) in New Jersey, to 42.2% (-2,388 crew days) in New Hampshire. The home port state of Massachusetts experienced the greatest absolute decline in total crew days during this time series, falling from 98,078 crew days in 2007 to 75,919 crew days (-22,159 days; -22.6%) in 2015. Total crew days dropped to nine-year lows in 2015 for Maine, New Hampshire and New York, while Connecticut, New Jersey, Rhode Island, and other northeast states combined saw lows in 2014. Despite the fact that Massachusetts experienced the greatest absolute decline in total crew days from 2007 to 2015, number of crew days increased annually after hitting a nine-year low in 2013. Regarding time spent per earning opportunity, the only home port states that experienced reductions in the ratio of crew days/crew trips between 2007 and 2015 were Connecticut (-8.4%), Maine (-6.4%), and other northeast states combined (-6.3%). This suggests that crew working on vessels with limited access groundfish permits in these home port states spent less time per earning opportunity in 2015 compared to 2007. The ratio of crew days/crew trips generally increased for the remaining home port states of Massachusetts (+29.8%), New Hampshire (+34.8%), New Jersey (+39.4%), New York (+3.8%), and Rhode Island (+3.9%), indicating that groundfish crew in these home port states spent more time per earning opportunity in 2015 than they did in 2007 (Table 40).

Care should be taken in interpreting the trends in employment indicator data. Changes in crew-based employment indicators do not indicate whether crew incomes have changed on their own. Crew income on a particular vessel is influenced by many factors, such as trip costs, revenue, and the sharing formula between owner and crew. Aggregate crew income across the groundfish fleet is heavily influenced by the number of active vessels. Discussions of measures of crew share and net revenues will be follow in subsequent sections.

8. NET REVENUES

Net revenues were estimated using trip costs[38] collected by Northeast Observers and At-Sea-Monitors, as well as other data sources. Net revenue is defined as gross revenue less trip costs. Typically, net revenue is then split between the vessel owner and the crew. Two types of net revenue analysis are provided: (1) yearly changes in average net revenue per day on groundfish_trips and non-groundfish trips and (2) yearly changes in aggregate net revenues for various vessel categories (vessel size and home port state categories). Actual annual financial profit is the sum of the owner's share of net revenue for all trips made over a year less annual fixed costs.[39] See Figure 9 for a graphical depiction of the components of annual financial profit and the relationship between owner's share and profit.

The NEFSC is not yet able to estimate profit for segments of the fleet or at the vessel level because of three data constraints: limited fixed cost data, limited information on ACE/DAS leasing costs and leasing revenues, and limited crew payment information. The NEFSC collects fixed cost data for commercial fishing businesses through its cost survey, most recently conducted in 2016 for 2015 costs, but we are still working to build reliable and valid models for fixed costs that can be incorporated in profitability estimates. Commercial fishing business owner response to the fixed cost survey was between 20.0%-30.0% for the 2011 and 2012 surveys, but dropped to just over 6.0% for the 2015 survey. There are some gear types for which NEFSC lacks adequate fixed cost data and therefore, segments of the fleet for which profitability cannot be reliably estimated.

To estimate profitability at the vessel level or for segments of the fleet, more information is needed about costs commercial fishermen may incur to lease ACE or DAS, and how those costs may be passed along to crew. Net sellers of ACE and DAS include vessels and vessel affiliations that fish and those that do not fish for allocated groundfish. At the fishing industry level, costs incurred to lease in quota to harvest fish and revenues received from leasing out quota balance each other out; aggregate quota costs equal aggregate quota revenues. However, leasing activity (leasing in or leasing out) can have important effects on profitability at the vessel or vessel affiliation level. ACE trading has distributional effects, as the impact of quota trades on net revenues will vary from sector member to sector member. For vessel owners that need quota in order to fish, obtaining quota is a true cost and the financial significance of that cost becomes greater with declining net revenues. In addition, in many cases, some portion of leasing costs may be passed along to crew. The NEFSC cost survey began collecting information about leasing costs at the vessel level in its 2011 and 2012 surveys. The 2015 cost survey began collecting information at the commercial fishing business level[40], and asked for total costs the business incurred to lease in ACE or DAS, and/or total revenues the business may have received from leasing out ACE or DAS.

Finally, the NEFSC collected information about crew payment systems in its 2011, 2012 and 2015 cost surveys. The survey asked about total payments to crew, as well as details about the lay system used for these payments. Commercial fishing business owners were asked to

[38] Trip costs are typically those that vary with the amount of fishing effort, including, but not limited to, fuel, bait, or fishing hooks.

[39] Fixed costs are typically those that do not vary with the amount of fishing effort. These costs include, but are not limited to, expenses such as insurance, principal and interest payments on business loans, office and business vehicle expenses.

[40] In the 2015 cost survey, a commercial fishing business was defined as an ownership group consisting of all permits associated with a unique combination of owners. This definition is the same definition used in analyses for the Regulatory Flexibility Act (RFA) requirements. A commercial fishing business may consist of one vessel or multiple vessels.

indicate whether quota leasing costs, if any, were deducted before distributing the boat, hired captain, and crew shares (i.e., deducted "off the top") or deducted from the boat, hired captain or crew share. Due to data constraints for fixed costs, leasing activity, and crew payments, we cannot include valid and reliable profitability estimates in this performance report, and thus we provide estimates of owner and crew shares of net revenue. While analysis of net revenue is just one component of annual financial profit, it is indicative of economic performance (at least in the short run).

Trip costs used in these analyses include fuel, oil, ice, supplies, bait, food, water, damage, lumper fees,[41] and sector membership fees. There may be additional trip costs (e.g., communications costs or trucking fees) that must be covered. Neither the costs incurred by vessels to purchase additional groundfish ACE in the period from 2010 to 2015 or to purchase DAS nor the revenues received from the leasing of ACE/DAS are included in the calculation of net revenue.[42] Because not all trips are observed, and therefore actual trip cost information is not available for all trips, costs must be estimated for the universe of trips using information from the sampled trips. To do this, trip cost data were used to calculate average trip costs per day absent for 184 vessel types, based on gear used, vessel length, trip duration (single vs. multi-day trips[43]), and fishing year (Table 41). For unobserved trips where actual trip costs were not available (or the data were insufficient to link a VTR record with an observed trip), the appropriate vessel type mean value was multiplied by the actual trip length (days absent) recorded in the VTR. The result is an estimate of the cost for each of the unobserved trips. From these data, an estimate of net revenue was obtained by subtracting the cost estimate from the actual total revenue received for the trip from all species landed. For trips where there was a direct match between the observed data and VTR data, actual trip costs were used.

An additional trip cost not collected by observers—but reported by most sectors in their 2010 through 2015 year-end reports—is the sector organizational cost charged to sector members. Based on the information in these reports (which are submitted to NMFS), a landings fee paid to the sector by sector members was calculated according to the formula provided in the year-end reports. For sectors that did not provide this information, a representative formula was used.

A variety of crew and owner share arrangements are used in the groundfish fishery, with different percentage splits between owner and crew, different costs deducted from net revenue, and different points within the formula where the split occurs (e.g., some vessel owners divide gross revenue first and then deduct certain costs from the crew's share of the gross revenue). Data from the SSB's commercial fishing business cost survey were used to determine common lay systems according to vessel size and number of crew.[44] The SSB cost survey also asks whether vessels were operated by the owner or a hired captain. However the survey data for this

[41] Lumper fee information is not collected by observers. Based on personal communications with fishermen, a rate of $0.04 per pound of landed weight is assumed.

[42] Additionally, sectors were required to partially fund the At-Sea Monitoring (ASM) program beginning in March 2016. This cost was not included in calculation of net revenue.

[43] One day equals 24 hours.

[44] For vessels greater than 75′, half of the trip expenses were subtracted from gross revenue and the owner's share was 50% of the resulting amount. The crew paid the other half of the trip expenses from their share. Vessels 50′ to < 75′ in length and with a crew of three or more used the same lay system as the large (≥75′) vessels. If the number of crew was less than three, the owner's share was 75% of gross revenue less all trip expenses. For vessels less than 50′, all trip expenses were deducted from gross revenues and the owner's share was 70% of the resulting net revenue. If resulting owner and/or crew shares were negative, they were assumed to be zero.

question are sparse. Because larger vessels with more crew tend to use hired captains, the following assumptions were made: for vessels less than 75′ with a crew size (including the captain) less than three, it was assumed that the operator was the owner. If the crew size was three or more, it was assumed that the operator was a hired captain. For vessels 75′ and greater, it was assumed that the operator was a hired captain regardless of the crew size.

8.1. Median Owner and Crew Shares Per Day

Median vessel owner and crew shares[45] of net revenue per day, by trip type (groundfish vs. non-groundfish) and vessel size category, are reported in Table 42 and Table 43. While values are provided for vessels less than 30' in length, since there are fewer vessels in this size category and since many of these vessels have permits for the primary purpose of transferring ACE to larger vessels, the results are not discussed. For all other size categories, the peak of median owner share per day and median crew share per man per day on groundfish trips occurred in the first or second year (2010 or 2011) of the sector management program. The only exception to this is that median crew share per man per day peaked in 2015 for vessels 75' and above. Median revenue per day on groundfish trips was also greatest in the first two years of the program. Thereafter, revenue per day declined somewhat. Trip costs per day on groundfish trips were greatest in 2011 for all vessels 30' in length and greater. These values then declined somewhat during 2012 – 2014 with a substantial drop in 2015 (Table 42). This decline in 2015 was due largely to a decline in fuel prices from $3.50 to $3.60 in 2011-2014 to just under $2.50 in 2015.

Peak median owner share per day and crew share per man per day on non-groundfish trips occurred in 2015. In 2015, for the two largest vessel size categories, revenue per day were near peak values while trip costs per day declined substantially, resulting in higher owner and crew shares. For vessels 30' to <50' trip costs per day on non-groundfish trips remained essentially unchanged across the full time series. Median revenue per day, however, was greatest in 2015 resulting in owner and crew shares peaking in 2015 as well (Table 43).

8.2. Median Owner and Crew Shares per Vessel

Owner and crew shares of net revenues may also be expressed at the vessel level rather than per day (Table 44). Crew shares are an expense for vessel owners and represent earnings for crew. It should be noted that the median crew share values are independent of the number of crew; these are median amounts paid to the entire crew regardless of size. For all vessel size categories > 30' in length, both median owner and crew share per vessel were greatest in 2015 with the exception of median crew share for vessels 30' to < 50' for which the peak occurred in 2011. These increases were substantial as compared to 2014 levels. For vessels 50' to <75' in length, median owner share increased by 28% and median crew share by 23%. For vessels 75' and greater, median owner share per vessel in 2015 increased by 23% over 2014 levels and

[45] Median values are given because the underlying distributions are skewed. The median share of net revenue that individual crew members receive per day absent provides information about how they may be faring financially. This is a function of gross revenue, trip costs, the crew share system used, trip length, and the number of crew on the trip. All of this is captured in median crew's share of net revenue per day per crew member.

median crew share increased by 56%. Prior to 2015, the greatest values occurred in 2011 with the exception of the peak occurring in 2013 for median owner and crew share for vessels 50' to <75' (Table 44).

8.3. Aggregate Owner and Crew Shares

Owner and crew shares of net revenues aggregated by fleet segments (vessel size and homeport state) are presented in Table 45 and Table 46, and reflect the combined result of shifts in median vessel performance and the shifts of activity among fleet segments.

For vessels 30' to <50', the peak aggregate owner and crew shares occurred in 2007, the beginning of the time series. Both owner and crew shares declined by 30.4% by 2015, the end of the time series. This was primarily due to a 37.5% decline in the number of active vessels (555 vessels to 347, Figure 4) over the same time period. For vessels in the 50' to <75' and 75' and greater vessel size categories, the peak aggregate owner and crew shares occurred in 2011. Aggregate owner and crew shares for the two largest size categories declined during 2012 – 2014 but then substantially increased in 2015 (Table 45).

Aggregate owner and crew shares in Massachusetts, the state with the most groundfish activity, increased in 2015 from 2014 (7.7% increase in owner share and 19.7% increase in crew share) but not to the peak levels seen in 2011. Aggregate owner and crew shares in Maine and New Hampshire both reached nine-year lows in 2015. In Maine, aggregate owner share decreased 11.6% from 2007-2015, while aggregate crew share decreased 10.0% over the same time period. Aggregate owner share in New Hampshire fell 51.1% from 2007-2015; in addition, aggregate crew share declined 50.0% during the time series (Table 46).

9. CONCLUDING REMARKS

Our analysis of fishery performance of the limited access Northeast Multispecies (Groundfish) fishery showed mostly negative trends in landings, revenue, and effort from 2007 to 2015. Compared to 2013, the last year for which a groundfish performance report was released, groundfish revenue in 2015 decreased by $3.9 million, but revenue from all species combined in 2015 increased by $3.0 million.

Landed pounds of groundfish and revenue from groundfish in 2015 were at their lowest point over the 2007-2015 period. The trend for non-groundfish revenue differs from the recent trend for groundfish revenue; 2015 marked the third-highest value for non-groundfish revenue over the 2007-2015 period. The percentage of total revenue from groundfish for the limited access groundfish fleet generally declined over time and reached a nine-year low in 2015. Average groundfish prices as an aggregate also generally declined over time, and 2015 marked the lowest value since 2009. Average non-groundfish prices as an aggregate were in decline from 2010 to 2014, but the 2015 value was the highest seen since 2010.

The number of fishermen landing groundfish in the northeast multispecies fishery is shrinking. Between 2007 and 2015, the total number of active vessels with limited access groundfish permits declined by 361 vessels, with 327 fewer vessels landing allocated groundfish from at least one groundfish trip in 2015 compared to 2007. During this time period, total earning opportunities for groundfish crew also declined, with the number of crew positions and the number of crew trips for the fleet both dropping to nine-year lows in 2015 and number of

crew days dropping to a low in 2014. While earning opportunities became scarcer for groundfish crew, the amount of time spent per earning opportunity increased from 2007 to 2015.

The number of MRIs and vessel affiliations leasing in ACE/PSC has been lower in more recent years (2013-2015) compared to the early years of catch share management (2010-2012). However, leased pounds were at the second-highest volume in 2015 when measured at the MRI level, and the highest volume in 2015 when measured at the vessel affiliation level. Total estimated transfer payments by MRI and vessel affiliation increased in 2014 and 2015, but remain lower than total lease payments made in 2010 and 2011.

Consolidation of the active limited access groundfish fleet was evident during 2007 – 2015. Over the nine-year time span, fewer active vessels and active vessel affiliations earned revenue from harvesting fish. The decrease in the number of active vessels and active vessel affiliations targeting groundfish was sharper than the decrease in the number of active vessels and vessel affiliations, but did not take groundfish trips. Both groundfish and total revenue from all species were unequally distributed throughout the groundfish fleet in 2007, with large percentages of total revenue from all species and groundfish revenue being earned by the top 20% of active vessels and active vessel affiliations. Both total revenue from all species and groundfish revenues were more concentrated among vessel affiliations than individual vessels. Groundfish revenues were more concentrated among top earning vessels and vessel affiliations than all species revenues throughout the time period. While total revenues from all species were concentrated in 2007 and remained concentrated over the 2007-2015 time period, the degree of concentration remained fairly stable during the nine-year period. This is in contrast to groundfish revenues, which were highly concentrated at the start of time series, and became more concentrated over the 2007-2015 period.

Compensation for vessel owners and fishing crew on groundfish trips, as measured by owner and crew shares per day on groundfish trips, was generally highest during the early years of sector management (2010 – 2011). Among the two largest vessel size classes, both owner share and crew share per day on groundfish trips increased in 2015 from 2013-2014 values. For all vessel size classes >30', the highest owner and crew shares per man per day on non-groundfish trips during the 2007-2015 period occurred in 2015. For vessels 30' and longer, average owner share and average crew share per vessel both increased from 2014 values in 2015. Aggregate owner and aggregate crew shares for the fleet as a whole were also higher in 2015 than in 2014, with every vessel size class seeing increases in aggregate owner and crew shares, except the 30' to <50' size class. For vessels in the 30' to < 50' size class, aggregate owner share in 2015 decreased 9.3% and aggregate crew share decreased 10.6% from 2014 values.

The NEFSC continues its work to provide more and better information on the social and economic performance of the groundfish fishery and other northeast fisheries, and to better understand the impacts that may result from changes in fishery management. Ongoing data collection efforts include collecting information on fixed, or non-trip, costs associated with running a commercial fishing business, which are necessary to understand profit. Fixed costs may vary considerably depending on vessel size and primary gear type, among other factors (Das, 2016). Data collected by the NEFSC also include socioeconomic data from participants in different fisheries, with the goal of improved understanding of how fishery regulations affect fishermen in their lives, including their work, their families, and their communities. In addition, the socioeconomic survey of commercial fishing crew helps to provide much needed demographic data for this group (Henry and Olson, 2015). There is currently no database of commercial fishing crew, and there is relatively little information available about crew members,

their interests in the fishery, or how their compensation changes with adjustments in fishing regulations. Collectively, NEFSC data can help to enhance the analysis of proposed management actions.

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Table 2. Year-end Target TACs and commercial sub-ACLs (in live metric tons) for all groundfish stocks, by fishing year.[46]

Groundfish Stock	2007 Target TAC	2008 Target TAC	2009 Target TAC	2010 Commercial sub-ACL	2010 Sector sub-ACL	2010 Common Pool sub-ACL	2011 Commercial sub-ACL	2011 Sector sub-ACL	2011 Common Pool sub-ACL
GB Cod East	494	667	527	338	325	13	200	196	4
GB Cod	8,416	10,222	4,328	3,430	3302	128	4,301	4,208	93
GOM Cod	10,020	10,491	10,724	4,567	4327	240	4,825	4,721	104
GB Haddock East	6,270	8,050	11,100	11,988	11913	75	9,640	9,581	59
GB Haddock	90,599	106,731	70,155	40,440	40186	254	30,580	30,393	187
GOM Haddock	1,254	1,229	1,564	825	799	26	778	770	8
GB Yellowtail Flounder	1,250	1,950	1,617	823	803	20	1,142	1,122	20
SNE/MA Yellowtail Flounder	213	312	389	310	235	75	524	404	120
CC/GOM Yellowtail Flounder	1,078	1,406	860	779	729	50	940	913	27
American Plaice	4,104	5,121	3,214	2,848	2748	100	3,108	3,038	70
Witch Flounder	5,075	4,331	1,129	852	827	25	1,236	1,211	25
GB Winter Flounder	1,604	1,782	2,004	1,852	1823	29	2,007	1,993	14
GOM Winter Flounder	NA**	NA**	379	158	133	25	329	313	16
SNE/MA Winter Flounder	3,016	3,577	0	NA*	NA*	NA*	726*	NA*	726*
Redfish	2,075	2,167	8,614	6,846	6756	90	7,541	7,505	36
White Hake	1,676	1,367	2,376	2,556	2505	51	2,974	2,946	28
Pollock	12,005	12,005	6,346	16,553	16178	375	13,952	13,848	104
Northern Windowpane Flounder*	389	389	581	NA	NA	NA	110	NA	110
Southern Windowpane Flounder*	166	159	279	NA	NA	NA	154	NA	154
Ocean Pout*	38	38	NA	NA	NA	NA	239	NA	239
Atlantic Halibut*	NA	NA	68	NA	NA	NA	33	NA	33
Wolfish*	NA	NA	NA	NA	NA	NA	73	NA	73

*Non-allocated groundfish stock for 2010-2015. SNE/MA winter flounder was not allocated for 2010-2012.
**Target TACs not calculated for GOM winter flounder because GARM II (NEFSC 2005) recommended against short-term projections due to assessment uncertainty.

[46] Sector sub-ACLs do not include sector carryover. GB cod and GB haddock stocks include Eastern GB cod and Eastern GB haddock stocks, respectively.

Table 2 (continued). Target TACs and commercial sub-ACLs (in live metric tons) for all groundfish stocks, by fishing year. [47]

Groundfish Stock	2012 Commercial sub-ACL	2012 Sector sub-ACL	2012 Common Pool sub-ACL	2013 Commercial sub-ACL	2013 Sector sub-ACL	2013 Common Pool sub-ACL
GB Cod East	162	159	3	92	90	2
GB Cod	4,605	4,524	81	1,807	1,776	32
GOM Cod	3,699	3,619	80	830	812	18
GB Haddock East	6,880	6,861	19	3,754	3,742	12
GB Haddock	27,438	27,363	75	26,196	26,111	85
GOM Haddock	653	648	5	187	185	2
GB Yellowtail Flounder	368	364	4	155	153	2
SNE/MA Yellowtail Flounder	760	607	153	586	488	98
CC/GOM Yellowtail Flounder	1,046	1,021	25	479	466	13
American Plaice	3,278	3,223	55	1,420	1,395	25
Witch Flounder	1,448	1,426	22	610	599	11
GB Winter Flounder	3,387	3,367	20	3,528	3,506	22
GOM Winter Flounder	715	690	25	715	688	26
SNE/MA Winter Flounder	303*	NA*	303*	1,210	1,074	136
Redfish	8,325	8,291	34	10,132	10,092	40
White Hake	3,283	3,257	26	3,849	3,822	27
Pollock	12,612	12,530	82	12,893	12,802	91
Northern Windowpane Flounder*	129	NA	129	98	NA	98
Southern Windowpane Flounder*	72	NA	72	102	NA	102
Ocean Pout*	214	NA	214	197	NA	197
Atlantic Halibut*	36	NA	36	52	NA	52
Wolfish*	73	NA	73	62	NA	62

*Non-allocated groundfish stock for 2010-2015. SNE/MA winter flounder was not allocated for 2010-2012.

[47] Sector sub-ACLs do not include sector carryover. GB cod and GB haddock stocks include Eastern GB cod and Eastern GB haddock stocks, respectively.

Table 2 (continued). Target TACs and commercial sub-ACLs (in live metric tons) for all groundfish stocks, by fishing year. [48]

Groundfish Stock	2014 Commercial sub-ACL	2014 Sector sub-ACL	2014 Common Pool sub-ACL	2015 Commercial sub-ACL	2015 Sector sub-ACL	2015 Common Pool sub-ACL
GB Cod East	148	145	3	123	121	1
GB Cod	1,769	1,736	33	1,787	1,748	37
GOM Cod	830	811	19	207	201	6
GB Haddock East***	10,004	9,454	69	17,760	15,045	157
GB Haddock	17,171	17,052	119	21,759	21,566	193
GOM Haddock	436	432	4	958	946	12
GB Yellowtail Flounder	255	251	4	203	199	4
SNE/MA Yellowtail Flounder	564	462	102	579	460	119
CC/GOM Yellowtail Flounder	479	463	16	458	437	21
American Plaice	1,382	1,356	26	1,408	1,381	27
Witch Flounder	610	598	12	610	596	14
GB Winter Flounder	3,385	3,356	29	1,891	1,873	18
GOM Winter Flounder	715	683	32	392	371	21
SNE/MA Winter Flounder	1,210	1,063	147	1,306	1,147	159
Redfish	10,565	10,521	44	11,034	10,970	64
White Hake	4,278	4,248	30	4,343	4,312	32
Pollock	13,224	13,139	85	13,720	13,634	86
Northern Windowpane Flounder*	98	NA	98	98	NA	98
Southern Windowpane Flounder*	102	NA	102	102	NA	102
Ocean Pout*	197	NA	197	195	NA	195
Atlantic Halibut*	57	NA	57	64	NA	64
Wolfish*	62	NA	62	62	NA	62

*Non-allocated groundfish stock for 2010-2015.

***For 2014-2015, GB Haddock East sub-ACLs reflect re-allocations of the overall stock, based on sectors converting GB Haddock to be fished outside the Eastern area.

[48] Sector sub-ACLs do not include sector carryover. GB cod and GB haddock stocks include Eastern GB cod and Eastern GB haddock stocks, respectively.

Table 3. Total landings and revenue from all trips, by fishing year.

Landed Pounds (in millions of pounds)	2007	2008	2009	2010	2011	2012	2013	2014	2015
Groundfish	63.5	71.5	69.8	58.4	61.9	47.4	42.3	43.4	41.6
Non-groundfish	195.8	199.2	187.0	177.9	212.1	213.2	201.1	199.5	189.5
Total Landed Pounds	259.3	270.7	256.8	236.2	274.0	260.6	243.4	242.9	231.1
Gross Revenue (in millions of 2010 dollars)	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Groundfish	$91.2	$90.4	$84.7	$83.4	$88.5	$67.7	$55.1	$55.4	$51.2 ($56.0)*
Non-groundfish	$214.9	$204.0	$185.2	$212.3	$236.0	$227.0	$211.4	$202.2	$218.4 (238.7)*
Total Gross Revenue	$306.1	$294.4	$269.9	$295.6	$324.5	$294.7	$266.5	$257.6	$269.5 ($294.7)*

*Nominal revenue observed during the Fishing Year.

Table 4: Total landings and revenue from groundfish trips, by fishing year.

Landed Pounds (in millions of pounds)	2007	2008	2009	2010	2011	2012	2013	2014	2015
Groundfish	63.4	71.5	69.7	58.3	61.8	47.4	42.1	43.2	41.5
Non-groundfish	39.3	34.9	31.3	23.6	29.2	28.1	20.7	25.4	24.6
Total Landed Pounds	102.7	106.3	101.1	81.9	91.0	75.5	62.9	68.6	66.2
Gross Revenue (in millions of 2010 dollars)	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Groundfish	$91.0	$90.3	$84.7	$83.1	$88.3	$67.6	$54.9	$55.3	$51.1 ($55.9)*
Non-groundfish	$43.1	$34.3	$27.4	$23.4	$32.1	$26.0	$22.2	$25.6	$21.0 ($22.9)*
Total Gross Revenue	$134.1	$124.6	$112.1	$106.6	$120.4	$93.7	$77.1	$80.9	$72.1 ($78.8)*

*Nominal revenue observed during the Fishing Year.

Table 5. Value of landings of all species (in millions of 2010 dollars), by state/city of landing and fishing year (all trips).

State/City of Landing	2007	2008	2009	2010	2011	2012	2013	2014	2015
CT	$3.1	$4.0	$4.0	$4.4	$6.3	$8.1	$6.9	$6.3	$6.7
MA	$170.5	$156.6	$162.0	$174.5	$188.9	$170.7	$147.7	$140.1	$141.6
BOSTON	$11.9	$11.6	$11.2	$14.2	$14.8	$13.3	$12.5	$13.2	$12.2
CHATHAM	$9.7	$9.3	$8.0	$7.5	$9.1	$7.1	$7.4	$9.8	$5.2
GLOUCESTER	$38.4	$37.5	$40.7	$39.9	$42.1	$31.2	$24.9	$25.5	$26.4
NEW BEDFORD	$91.1	$81.3	$84.9	$95.4	$106.5	$100.9	$87.0	$73.8	$77.8
ME	$25.4	$23.2	$18.5	$18.6	$18.7	$19.8	$20.0	$23.2	$20.8
PORTLAND	$12.3	$12.5	$7.6	$6.3	$7.4	$8.6	$8.8	$9.5	$9.8
NH	$6.4	$6.3	$7.6	$6.8	$7.1	$6.4	$4.7	$4.1	$4.2
NJ	$26.6	$29.0	$19.4	$25.1	$27.8	$23.7	$20.6	$19.3	$26.1
NY	$20.9	$19.0	$18.7	$21.5	$24.2	$19.8	$18.2	$16.4	$14.6
RI	$37.9	$37.2	$28.0	$30.9	$36.5	$32.6	$36.8	$35.1	$34.8
POINT JUDITH	$23.9	$26.7	$20.1	$22.3	$27.8	$23.9	$28.6	$28.1	$28.3
Other Northeast	$15.3	$19.2	$11.8	$13.8	$15.0	$13.7	$11.5	$13.1	$20.7
Grand Total	**$306.1**	**$294.4**	**$269.9**	**$295.6**	**$324.5**	**$294.7**	**$266.5**	**$257.6**	**$269.5**

Table 6. Value of landings of all species (in millions of 2010 dollars), by home port state/city and fishing year (all trips).

Home Port State/City	2007	2008	2009	2010	2011	2012	2013	2014	2015
CT	$4.4	$4.5	$3.9	$5.7	$5.2	$8.3	$6.9	$5.7	$6.3
MA	$154.9	$142.5	$142.1	$150.0	$165.0	$145.5	$127.3	$125.3	$131.7
BOSTON	$35.1	$30.3	$26.7	$28.1	$30.9	$26.4	$25.0	$27.6	$29.5
CHATHAM	$7.5	$7.2	$6.5	$6.5	$8.8	$6.5	$7.3	$9.3	$5.4
GLOUCESTER	$22.1	$21.5	$23.9	$25.0	$25.9	$21.6	$17.0	$18.0	$19.1
NEW BEDFORD	$61.5	$58.7	$59.3	$64.8	$75.9	$67.7	$58.0	$49.0	$55.5
ME	$30.1	$28.0	$28.0	$31.1	$29.1	$28.1	$27.0	$27.7	$24.6
PORTLAND	$10.0	$9.0	$10.5	$12.9	$12.7	$12.2	$12.9	$12.5	$10.2
NH	$9.2	$10.8	$9.7	$7.5	$8.9	$7.7	$5.6	$4.8	$4.2
NJ	$22.4	$21.2	$17.7	$21.0	$23.8	$22.8	$21.4	$20.3	$24.0
NY	$23.1	$25.5	$23.1	$27.5	$31.6	$27.1	$24.1	$24.6	$23.1
RI	$41.6	$39.8	$30.4	$35.4	$40.9	$35.8	$37.0	$33.6	$35.0
POINT JUDITH	$26.3	$27.2	$20.2	$23.0	$28.0	$24.9	$25.9	$23.4	$25.6
Other Northeast	$20.4	$22.2	$15.0	$17.5	$19.9	$19.4	$17.1	$15.5	$20.6
Grand Total	**$306.1**	**$294.4**	**$269.9**	**$295.6**	**$324.5**	**$294.7**	**$266.5**	**$257.6**	**$269.5**

Table 7. Value of landings of groundfish (in millions of 2010 dollars), by state/city of landing and fishing year (all trips).

State/City of Landing	2007	2008	2009	2010	2011	2012	2013	2014	2015
CT	$0.2	$0.2	$0.0	$0.0	$0.0	$0.1	$0.2	$0.1	$0.2
MA	$69.1	$70.7	$71.9	$73.7	$76.3	$55.5	$44.5	$45.5	$42.7
BOSTON	$8.6	$9.0	$8.9	$11.6	$12.1	$11.1	$9.7	$10.5	$9.4
CHATHAM	$3.4	$3.5	$3.2	$2.2	$2.3	$1.0	$0.7	$0.5	$0.5
GLOUCESTER	$24.7	$27.5	$30.8	$27.7	$29.3	$20.5	$14.5	$14.0	$13.9
NEW BEDFORD	$27.3	$26.7	$24.0	$29.6	$29.5	$20.8	$18.5	$19.8	$17.9
ME	$10.1	$10.9	$6.1	$4.3	$5.9	$6.9	$5.7	$6.5	$5.2
PORTLAND	$9.0	$10.3	$5.1	$3.4	$4.8	$6.0	$5.3	$6.0	$4.8
NH	$3.4	$4.1	$4.4	$3.3	$4.2	$3.3	$1.9	$1.4	$0.6
NJ	$1.1	$0.5	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0
NY	$1.5	$0.9	$0.3	$0.2	$0.1	$0.2	$0.4	$0.3	$0.5
RI	$5.6	$3.1	$1.9	$1.8	$1.9	$1.8	$2.2	$1.8	$1.8
POINT JUDITH	$4.7	$2.5	$1.8	$1.7	$1.9	$1.7	$2.2	$1.7	$1.8
Other Northeast	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Grand Total	**$91.2**	**$90.4**	**$84.7**	**$83.4**	**$88.5**	**$67.7**	**$55.1**	**$55.4**	**$51.2**

Table 8. Value of landings of groundfish (in millions of 2010 dollars), by home port state/city and fishing year (all trips).

Home Port State/City	2007	2008	2009	2010	2011	2012	2013	2014	2015
CT	$0.5	$0.4	$0.1	$0.1	$0.0	$0.0	$0.1	$0.0	$0.2
MA	$59.4	$59.9	$59.5	$59.6	$64.3	$47.2	$37.2	$39.0	$38.1
BOSTON	$16.5	$15.1	$13.7	$14.5	$16.9	$12.6	$10.6	$12.7	$13.4
CHATHAM	$2.9	$2.8	$2.8	$2.4	$2.5	$0.9	$0.8	$0.5	$0.5
GLOUCESTER	$14.0	$14.8	$16.9	$16.7	$16.7	$13.6	$9.4	$9.5	$9.5
NEW BEDFORD	$16.7	$18.3	$16.2	$18.5	$20.3	$14.9	$12.7	$13.5	$11.8
ME	$14.2	$15.2	$14.2	$14.8	$14.9	$13.9	$12.1	$11.6	$8.4
PORTLAND	$6.6	$7.0	$8.3	$10.5	$10.1	$9.3	$9.7	$9.3	$6.9
NH	$4.9	$7.2	$6.0	$3.7	$4.5	$3.4	$2.3	$2.0	$1.4
NJ	$1.2	$0.7	$0.4	$0.3	$0.1	$0.1	$0.1	$0.1	$0.0
NY	$2.3	$1.6	$0.8	$1.1	$1.4	$0.7	$0.8	$0.7	$0.9
RI	$7.1	$4.4	$3.0	$3.3	$2.8	$2.4	$2.5	$2.0	$2.1
POINT JUDITH	$4.8	$3.2	$2.2	$2.4	$2.0	$1.8	$1.9	$1.5	$1.9
Other Northeast	$1.5	$1.1	$0.7	$0.6	$0.4	$0.1	$0.0	$0.0	$0.0
Grand Total	**$91.2**	**$90.4**	**$84.7**	**$83.4**	**$88.5**	**$67.7**	**$55.1**	**$55.4**	**$51.2**

Table 9. Value (in millions of 2010 dollars) and landed pounds (in millions) of nine allocated groundfish species* landed by limited access groundfish vessels, by fishing year.

Species	2007	2008	2009	2010	2011	2012	2013	2014	2015
COD	$30.9	$30.6	$29.1	$26.6	$30.3	$16.2	$9.0	$7.5	$6.3
(GADUS MORHUA)	16.3	16.8	19.6	12.2	14.0	6.7	4.3	3.8	3.4
HADDOCK	$14.7	$17.2	$17.1	$20.8	$13.7	$5.0	$7.3	$12.0	$10.9
(MELANOGRAMMUS AEGLEFINUS)	8.8	13.7	15.3	16.7	8.3	2.2	5.5	10.2	9.5
POLLOCK	$10.0	$11.7	$11.0	$10.1	$12.8	$12.2	$10.1	$9.2	$6.2
(POLLACHIUS VIRENS)	18.3	20.0	14.1	10.7	14.6	12.4	9.3	7.6	5.5
FLOUNDER, WINTER	$13.0	$9.9	$7.6	$6.6	$8.0	$9.1	$9.2	$7.2	$7.0
(PLEURONECTES AMERICANUS)	5.9	5.4	4.5	3.3	4.6	4.8	5.9	4.0	3.7
HAKE, WHITE	$4.4	$3.9	$4.3	$4.9	$6.1	$6.7	$5.5	$5.2	$4.5
(UROPHYCIS TENUIS)	3.0	2.9	3.5	3.7	5.0	4.0	3.3	2.8	2.6
FLOUNDER, AM. PLAICE	$4.1	$4.4	$4.4	$4.4	$4.4	$4.8	$4.3	$4.4	$5.0
(HIPPOGLOSSOIDES PLATESSOIDES)	2.4	2.9	3.3	3.0	3.2	3.0	2.8	2.7	2.9
FLOUNDER, YELLOWTAIL	$6.2	$5.9	$5.1	$3.9	$5.6	$4.6	$2.5	$2.0	$2.2
(PLEURONECTES FERRUGINEUS)	3.3	4.2	3.8	3.0	4.5	3.2	1.7	1.5	1.5
FLOUNDER, WITCH	$6.0	$4.9	$4.3	$3.6	$4.0	$3.8	$3.0	$2.6	$2.5
(GLYPTOCEPHALUS CYNOGLOSSUS)	2.5	2.2	2.2	1.5	2.1	2.0	1.3	1.0	1.1
REDFISH	$1.3	$1.6	$1.6	$2.5	$3.7	$5.2	$4.0	$5.0	$6.1
(SEBASTES SP)	2.4	2.9	3.2	4.3	5.6	9.0	8.0	9.7	11.4

*Sorted descending by average value over nine years.

Table 10. Value (in millions of 2010 dollars) and landed pounds (in millions) of top ten non-groundfish species* landed by limited access groundfish vessels, by fishing year.

Species	2007	2008	2009	2010	2011	2012	2013	2014	2015
SCALLOP, SEA	$65.3	$63.1	$61.4	$71.1	$87.1	$85.9	$72.5	$56.7	$70.6
(PATINOPECTEN, PLACOPECTEN SP)	9.6	9.3	9.5	8.3	8.9	8.9	6.6	4.8	6.3
LOBSTER	$37.9	$31.4	$29.8	$33.7	$28.8	$30.6	$32.5	$36.3	$37.6
(HOMARUS AMERICANUS)	7.4	7.7	8.5	8.7	7.5	8.8	8.8	8.8	8.8
SQUID (LOLIGO)	$16.6	$23.2	$15.1	$18.0	$19.6	$22.4	$23.8	$18.7	$26.8
(LOLIGO PEALEI)	17.8	24.5	15.7	16.5	15.6	21.2	23.8	20.3	24.0
ANGLER	$24.2	$19.0	$15.4	$16.2	$22.1	$15.3	$13.1	$13.5	$13.8
(LOPHIUS AMERICANUS)	11.3	9.0	7.6	6.7	8.6	7.2	6.8	7.2	7.5
FLOUNDER,SUMMER	$15.4	$11.5	$12.3	$16.3	$17.3	$16.8	$15.6	$17.0	$15.3
(PARALICHTHYS DENTATUS)	6.0	5.2	5.9	8.6	7.9	7.1	6.2	6.1	5.2
HAKE, SILVER	$7.6	$8.2	$8.5	$11.1	$10.7	$9.3	$8.5	$10.4	$9.7
(MERLUCCIUS BILINEARIS)	14.0	12.7	17.1	17.5	16.5	14.6	14.3	15.3	12.7
SKATES (RACK)	$9.0	$7.0	$7.0	$4.9	$6.7	$5.1	$5.5	$6.9	$4.7
(RAJIDAE)	28.0	25.2	24.0	18.1	20.4	18.2	17.0	17.8	19.6
HERRING, ATLANTIC	$4.3	$4.1	$3.5	$3.2	$6.3	$7.0	$8.5	$8.2	$7.6
(CLUPEA HARENGUS)	38.8	36.8	33.9	25.6	55.4	55.8	68.9	63.1	58.0
SCUP	$4.1	$3.5	$3.8	$4.7	$6.8	$6.1	$5.9	$6.9	$7.3
(STENOTOMUS CHRYSOPS)	4.6	4.4	6.2	7.9	10.5	11.5	10.7	12.2	10.7
CRAB, JONAH	$2.9	$2.6	$2.5	$2.6	$2.3	$4.1	$4.4	$3.5	$2.8
(CANCER BOREALIS)	4.9	4.6	4.6	4.6	3.4	6.1	5.9	4.9	4.0

*Sorted descending by average value over nine years

Table 11. Number of vessels by fishing year.

As of May 1 each fishing year:	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total groundfish limited access eligibilities	1,695	1,674	1,464	1,441	1,422	1,408	1,380	1,371	1,358
Eligibilities held as Confirmation of Permit History	75	71	81	94	168	228	273	303	369
During any part of the fishing year:*	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total eligible vessels	1,745	1,688	1,459	1,409	1,321	1,223	1,155	1,095	1,035
Eligible vessels that did not renew a limited access groundfish permit	227	226	28	26	42	46	36	34	45
Vessels with a limited access groundfish permit	1,518	1,462	1,431	1,383	1,279	1,177	1,119	1,061	990
While under a limited access groundfish permit:	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
... those with revenue from any species**	1,039	966	923	857	781	762	734	722	678
... those with allocated groundfish landings from at least one groundfish trip	596	550	519	392	371	356	311	278	269
... those with no landings	479	496	508	526	498	415	385	339	312
Percent of inactive (no landings) vessels	(32%)	(34%)	(35%)	(38%)	(39%)	(35%)	(34%)	(32%)	(32%)

*On May 1st of the fishing year the number of vessels will equal to the number of eligibilities not in Confirmation of Permit History (CPH). Over time the number of vessels will differ from the number of eligibilities because these eligibilities can be transferred from vessel to vessel during the fishing year. These vessel counts exclude groundfish limited access eligibilities held as CPH. Starting in 2010, Amendment 16 authorized CPH holders to join sectors and to lease DAS. For purposes of comparison, CPH vessels are not included in the data for either sector or common pool.

****** Active vessels in this report received revenue from any species while fishing under a limited access groundfish permit.

Table 12. Number of vessels with revenue from any species (all trips), by home port state/city and fishing year.

Home Port State/City	2007	2008	2009	2010	2011	2012	2013	2014	2015
CT	16	12	13	12	11	10	10	13	15
MA	520	475	460	421	378	371	355	346	331
BOSTON	77	63	60	52	45	47	46	45	45
CHATHAM	46	40	42	43	38	38	35	34	31
GLOUCESTER	118	108	109	105	92	88	83	79	72
NEW BEDFORD	95	91	87	69	69	69	66	65	64
ME	131	116	114	104	92	95	87	88	74
PORTLAND	21	17	15	16	16	18	17	17	12
NH	60	57	55	50	45	41	38	35	27
NJ	65	69	60	56	48	46	48	48	47
NY	97	100	95	93	91	87	82	79	70
RI	106	99	92	86	82	77	77	77	77
POINT JUDITH	56	51	47	45	44	44	45	43	46
Other Northeast	44	38	34	35	34	35	37	36	37
Grand Total*	**1,039**	**966**	**923**	**857**	**781**	**762**	**734**	**722**	**678**

*****State vessel counts may exceed the grand total vessel count because vessels may change home port during the fishing year.

Table 13. Number of vessels with revenue from at least one groundfish trip, by home port state/city and fishing year.

Home Port State/City	2007	2008	2009	2010	2011	2012	2013	2014	2015
CT	9	8	8	7	5	5	7	9	7
MA	342	322	311	236	222	207	176	159	154
BOSTON	56	50	44	35	30	28	25	24	25
CHATHAM	28	27	28	26	25	23	20	17	18
GLOUCESTER	93	89	96	74	69	61	53	49	45
NEW BEDFORD	61	62	52	33	37	36	33	35	32
ME	78	68	64	42	48	51	39	35	26
PORTLAND	19	15	13	14	15	16	14	14	10
NH	42	43	42	32	28	25	25	19	15
NJ	47	42	28	21	17	11	13	12	3
NY	59	63	47	40	42	42	34	26	28
RI	76	68	60	55	48	54	48	44	44
POINT JUDITH	42	35	32	31	28	33	30	27	32
Other Northeast	16	12	13	13	9	8	6	6	3
Grand Total*	**669**	**626**	**573**	**446**	**419**	**403**	**348**	**310**	**280**

*****State vessel counts may exceed the grand total vessel count because vessels may change home port during the fishing year.

Table 14. Effort by active vessels, by vessel size class and fishing year.[49]

Vessels less than 30'	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number of groundfish trips	263	236	410	101	248	160	102	102	153
Number of non-groundfish trips	1,683	1,619	1,569	1,468	1,199	1,093	1,247	1,309	1,318
Number of days absent on groundfish trips	100	79	150	42	89	55	41	44	52
Number of days absent on non-groundfish trips	534	519	508	463	378	330	400	444	422
Average trip length on groundfish trips*	0.39	0.35	0.37	0.42	0.36	0.35	0.41	0.43	0.34
(standard deviation)	0.17	0.14	0.18	0.10	0.11	0.11	0.20	0.23	0.16
Average trip length on non-groundfish trips*	0.36	0.35	0.35	0.33	0.33	0.31	0.33	0.34	0.33
(standard deviation)	0.32	0.30	0.21	0.14	0.10	0.11	0.12	0.13	0.11
Vessels 30' to <50'	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Number of Groundfish Trips	18,476	18,706	19,785	9,408	11,364	10,158	6,814	6,299	4,800
Number of non-groundfish Trips	24,963	22,234	22,714	23,850	20,575	20,590	20,861	21,187	20,705
Number of days absent on groundfish trips	9,774	9,790	9,431	5,441	6,730	6,239	5,107	4,450	3,699
Number of days absent on non-groundfish trips	9,758	8,141	8,508	9,377	8,209	8,357	8,597	8,971	8,404
Average trip length on groundfish trips*	0.53	0.53	0.48	0.58	0.59	0.61	0.75	0.71	0.77
(standard deviation)	0.68	0.65	0.60	0.66	0.71	0.74	0.88	0.87	0.98
Average trip length on non-groundfish trips*	0.45	0.43	0.43	0.43	0.42	0.43	0.42	0.43	0.43
(standard deviation)	0.49	0.46	0.48	0.36	0.36	0.32	0.32	0.37	0.34

* For some trips, trip length could not be calculated due to missing values for sail and landing dates in the VTR data for the trip. In this case, the sail and landing dates from AMS data were used to determine the trip length when possible. For trips where the resulting trip length value was either zero or negative, trip length was set at 1 day. For cases where the resulting trip length was $\geq$ 31 days, trip length was treated as missing. Finally, in cases where trip length could not be determined because sailing and landing dates were not available from either the VTR or AMS data, the value of trip length was treated as missing. Thus, the average trip length values provided in this report may differ from those obtained by dividing the overall number of days absent by the overall number of trips listed in this report for both groundfish and non-groundfish trips.

[49] Mean values should be taken in context with standard deviations, as most standard deviations are relatively high.

Table 14 (continued). Effort by active vessels, by vessel size class and fishing year.[50]

Vessels 50' to <75'	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number of Groundfish Trips	7,139	6,366	4,819	2,865	3,292	3,260	2,779	2,402	2,510
Number of non-groundfish Trips	10,239	10,075	11,052	11,075	9,942	9,038	8,700	7,721	8,050
Number of days absent on groundfish trips	11,377	10,601	8,973	6,395	7,495	6,917	6,003	5,974	5,306
Number of days absent on non-groundfish trips	12,537	12,282	13,414	12,905	11,797	12,262	12,513	11,611	12,542
Average trip length on groundfish trips*	1.62	1.68	1.87	2.24	2.28	2.12	2.16	2.49	2.11
(standard deviation)	2.24	2.28	2.42	2.56	2.63	2.49	2.58	2.65	2.52
Average trip length on non-groundfish trips*	1.28	1.28	1.25	1.18	1.20	1.37	1.45	1.51	1.57
(standard deviation)	1.73	1.76	1.76	1.69	1.71	1.90	1.93	1.94	1.97
Vessels 75' and above	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Number of Groundfish Trips	1,442	1,310	1,209	1,162	1,111	1,074	982	1,044	990
Number of non-groundfish Trips	2,515	2,862	2,618	2,274	2,146	2,126	1,970	1,888	1,936
Number of days absent on groundfish trips	7,215	6,807	6,517	6,647	7,252	6,865	6,255	6,289	6,087
Number of days absent on non-groundfish trips	9,633	9,728	9,241	8,660	7,656	7,991	7,669	6,909	7,442
Average trip length on groundfish trips*	5.09	5.28	5.44	5.73	6.53	6.40	6.37	6.03	6.15
(standard deviation)	3.17	3.07	3.09	2.81	2.80	2.84	2.57	2.51	2.58
Average trip length on non-groundfish trips*	4.05	3.54	3.70	3.90	3.61	3.79	3.92	3.72	3.90
(standard deviation)	3.56	3.32	3.50	3.57	3.26	3.34	3.15	3.10	3.05

* For some trips, trip length could not be calculated due to missing values for sail and landing dates in the VTR data for the trip. In this case, the sail and landing dates from AMS data were used to determine the trip length when possible. For trips where the resulting trip length value was either zero or negative, trip length was set at 1 day. For cases where the resulting trip length was $\geq$ 31 days, trip length was treated as missing. Finally, in cases where trip length could not be determined because sailing and landing dates were not available from either the VTR or AMS data, the value of trip length was treated as missing. Thus, the average trip length values provided in this report may differ from those obtained by dividing the overall number of days absent by the overall number of trips listed in this report for both groundfish and non-groundfish trips.

[50] Mean values should be taken in context with standard deviations, as most standard deviations are relatively high.

Table 14 (continued). Effort by active vessels, by vessel size class and fishing year.[51]

All Vessels	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number of Groundfish Trips	27,320	26,618	26,223	13,536	16,015	14,652	10,677	9,847	8,453
Number of non-groundfish Trips	39,400	36,790	37,953	38,667	33,862	32,847	32,778	32,105	32,009
Number of days absent on groundfish trips	28,466	27,277	25,071	18,525	21,566	20,076	17,406	16,757	15,144
Number of days absent on non-groundfish trips	32,462	30,670	31,671	31,405	28,040	28,940	29,179	27,935	28,810
Average trip length on groundfish trips*	1.05	1.03	0.96	1.37	1.35	1.37	1.63	1.70	1.79
(standard deviation)	1.81	1.78	1.74	2.14	2.19	2.18	2.34	2.38	2.47
Average trip length on non-groundfish trips*	0.91	0.94	0.92	0.86	0.86	0.91	0.91	0.89	0.93
(standard deviation)	1.64	1.65	1.66	1.56	1.52	1.61	1.57	1.51	1.57

* For some trips, trip length could not be calculated due to missing values for sail and landing dates in the VTR data for the trip. In this case, the sail and landing dates from AMS data were used to determine the trip length when possible. For trips where the resulting trip length value was either zero or negative, trip length was set at 1 day. For cases where the resulting trip length was $\geq$ 31 days, trip length was treated as missing. Finally, in cases where trip length could not be determined because sailing and landing dates were not available from either the VTR or AMS data, the value of trip length was treated as missing. Thus, the average trip length values provided in this report may differ from those obtained by dividing the overall number of days absent by the overall number of trips listed in this report for both groundfish and non-groundfish trips.

[51] Mean values should be taken in context with standard deviations, as most standard deviations are relatively high.

Table 15. Average revenue (in thousands of 2010 dollars) per active vessel, by vessel size class and fishing year.[52]

Vessels less than 30'	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Number of active vessels with revenue from least one groundfish trip	26	26	33	22	19	15	17	14	12
Average all species revenue per vessel on groundfish trips	$5.7	$3.4	$6.8	$1.7	$5.7	$5.9	$1.5	$2.7	$7.0
(standard deviation)	$10.7	$4.3	$12.3	$2.2	$10.5	$11.8	$2.0	$4.0	$18.3
Number of active vessels taking at least one non-groundfish trip	62	58	63	60	47	40	44	43	38
Average all species revenue per vessel on non-groundfish trips	$12.1	$12.7	$10.0	$14.2	$14.0	$14.3	$16.4	$18.4	$21.7
(standard deviation)	$27.4	$31.0	$26.7	$35.0	$43.3	$26.7	$36.8	$36.8	$42.4
Vessels 30' to < 50'	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Number of active vessels with revenue from least one groundfish trip	358	340	313	243	219	210	176	148	125
Average all species revenue per vessel on groundfish trips	$115.9	$123.4	$126.1	$111.9	$147.6	$119.5	$100.3	$119.0	$105.1
(standard deviation)	$113.7	$142.1	$121.7	$120.9	$153.8	$131.3	$119.4	$131.0	$112.0
Number of active vessels taking at least one non-groundfish trip	458	422	396	410	356	346	325	331	320
Average all species revenue per vessel on non-groundfish trips	$81.4	$77.2	$77.4	$97.0	$97.9	$97.1	$107.4	$123.4	$122.3
(standard deviation)	$114.9	$105.5	$92.8	$128.5	$111.3	$107.5	$135.1	$184.2	$129.2

[52] Mean values should be taken in context with standard deviations, as most standard deviations are relatively high.

Table 15 (continued). Average revenue (in 2010 dollars) per active vessel, by vessel size class and fishing year.[53]

Vessels 50' to < 75'	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Number of active vessels with revenue from least one groundfish trip	207	188	160	123	120	121	106	103	97
Average all species revenue per vessel on groundfish trips	$245.9	$244.0	$243.3	$294.3	$346.1	$267.0	$254.9	$275.5	$258.5
(standard deviation)	$250.4	$256.0	$291.4	$382.1	$419.9	$330.8	$319.9	$367.8	$388.7
Number of active vessels taking at least one non-groundfish trip	220	214	200	188	177	171	154	166	158
Average all species revenue per vessel on non-groundfish trips	$281.2	$287.9	$298.9	$374.0	$436.7	$443.7	$464.4	$386.0	$477.4
(standard deviation)	$324.4	$309.6	$297.9	$389.8	$447.9	$429.7	$377.1	$333.1	$404.6
Vessels 75' and Above	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Number of active vessels with revenue from least one groundfish trip	78	72	67	58	61	60	49	45	46
Average all species revenue per vessel on groundfish trips	$532.4	$513.6	$499.8	$743.8	$761.7	$616.6	$661.7	$774.9	$734.1
(standard deviation)	$440.6	$421.5	$430.4	$604.2	$607.3	$504.2	$482.2	$460.2	$462.0
Number of active vessels taking at least one non-groundfish trip	103	100	97	83	83	82	79	77	75
Average all species revenue per vessel on non-groundfish trips	$700.8	$752.2	$688.3	$941.4	$1,112.7	$1,118.8	$1,041.0	$921.9	$1,094.6
(standard deviation)	$588.7	$587.8	$531.8	$630.6	$725.3	$748.9	$627.8	$607.1	$606.7

[53] Mean values should be taken in context with standard deviations, as most standard deviations are relatively high.

Table 16. Lowe Index (2007=1) of productivity change on groundfish trips taken by the limited access groundfish fleet, by fishing year.

Year	Output Index	Input Index	Lowe Index
2007	1	1	1
2008	1.05	0.91	1.15
2009	1.03	0.84	1.23
2010	0.75	0.63	1.19
2011	0.82	0.73	1.13
2012	0.64	0.68	0.94
2013	0.58	0.6	0.96
2014	0.53	0.54	0.98
2015	0.53	0.5	1.04

Table 17. Number of MRIs leasing in ACE and/or PSC and millions of live pounds leased in, by home port state/ city and fishing year.

Home Port State/City	2010 (n)	2010 (lbs.)	2011 (n)	2011 (lbs.)	2012 (n)	2012 (lbs.)	2013 (n)	2013 (lbs.)	2014 (n)	2014 (lbs.)	2015 (n)	2015 (lbs.)
MA	170	16.9	155	22.1	152	15.1	136	13.7	127	15.5	124	18.9
BOSTON	31	3.5	31	6.2	25	4.4	22	3.6	21	4.4	21	6.2
CHATHAM	25	0.7	18	0.9	17	0.3	18	0.2	16	0.2	15	0.2
GLOUCESTER	51	3.5	48	3.7	47	2.8	41	2.8	37	2.9	36	4.1
NEW BEDFORD	28	7.4	32	9.1	32	6.3	28	5.8	30	7.3	30	7.4
ME	34	4.5	36	5.5	38	6.4	35	5.8	26	4.9	22	3.9
PORTLAND	11	3.3	10	3.8	12	5.1	15	4.7	12	4.1	10	3.6
NH	19	0.8	18	1.8	15	0.9	14	0.7	14	0.5	10	0.3
RI & CT	29	0.9	26	1	32	0.7	30	0.6	26	0.5	30	0.5
POINT JUDITH	22	0.8	21	0.9	25	0.5	22	0.4	20	0.3	22	0.4
NY & NJ	5	0.1	4	0.2	6	0.2	8	0.2	9	0.3	7	0.2
Other Northeast	5	0.0	10	0.7	ND*	ND*	ND*	ND*	3	0.0	ND*	ND*
Grand Total	**262**	**23.3**	**249**	**31.3**	**243**	**23.3**	**224**	**21.0**	**205**	**21.7**	**194**	**23.9**

*Certain data are not disclosed for confidentiality reasons. In these cases, values are provided as "ND."

Table 18. Number of vessel affiliations leasing in ACE and/or PSC and millions of live pounds leased in, by home port state/city and fishing year.

Home Port State/City	2010 (n)	2010 (lbs.)	2011 (n)	2011 (lbs.)	2012 (n)	2012 (lbs.)	2013 (n)	2013 (lbs.)	2014 (n)	2014 (lbs.)	2015 (n)	2015 (lbs.)
MA	111	6.2	99	10.7	97	5.5	87	6.4	75	6.1	86	12.9
BOSTON	12	0.6	12	1.3	9	1.5	12	2.0	8	2.0	13	4.9
CHATHAM	19	0.5	16	0.8	15	0.2	13	0.1	11	0.1	14	0.1
GLOUCESTER	42	2.0	43	3.5	39	1.9	32	1.4	28	1.5	29	3.2
NEW BEDFORD	12	2.4	12	4.5	12	1.3	11	2.4	11	2.3	15	4.5
ME	28	2.2	29	3.6	32	4.0	26	4.2	20	2.7	23	4.3
PORTLAND	9	1.6	9	2.6	10	3.2	11	3.5	8	2.0	11	3.9
NH	17	0.8	15	1.3	12	0.5	11	0.4	11	0.3	9	0.3
RI & CT	29	0.7	27	0.9	30	0.7	24	0.5	21	0.5	24	0.4
POINT JUDITH	22	0.6	21	0.8	24	0.6	18	0.4	16	0.4	19	0.4
NY & NJ	5	0.2	4	0.2	6	0.2	7	0.2	10	1.0	7	0.2
Other Northeast	4	0.0	NA*	NA*	NA*	NA*	NA*	NA*	3	0.0	NA*	NA*
Grand Total	194	10.1	176	16.8	178	10.9	156	11.7	140	10.6	150	18.1

*Certain data are not disclosed for confidentiality reasons. In these cases, values are provided as "ND."

Table 19. Number of MRIs leasing in ACE and/or PSC, by vessel size category and fishing year.

Vessel Size Category	2010	2011	2012	2013	2014	2015
Less than 30'	2	6	5	4	3	0
30' to <50'	126	107	107	102	83	77
50' to <75'	78	74	77	78	76	73
75' and Above	55	55	54	40	43	44
Grand Total	**261**	**242**	**243**	**224**	**205**	**194**

Table 20. ACE and PSC lease markets by stock (millions of live pounds) and fishing year.

Stock	2010 Lbs. available*	2010 Lbs. leased in**	2011 Lbs. available*	2011 Lbs. leased in**	2012 Lbs. available*	2012 Lbs. leased in**
Cod, GB East	0.5	0.4	0.3	0.2	0.3	0.1
Cod, GB West	4.2	3.3	6.6	3.9	8.0	1.0
Cod, GOM	5.4	4.0	6.5	5.1	6.3	2.2
Haddock, GB East	22.6	0.4	18.7	0.0	14.3	0.0
Haddock, GB West	49.3	1.1	44.3	0.2	47.6	0.0
Haddock, GOM	1.3	0.4	1.3	0.6	1.5	0.2
Plaice	4.2	1.5	5.0	1.7	5.5	1.5
Pollock	26.7	3.3	21.5	6.1	20.8	5.2
Redfish	11.6	1.5	13.6	2.4	14.8	4.9
White hake	3.6	2.8	4.2	4.2	4.9	2.8
Winter flounder, GB	2.6	1.7	3.0	2.6	5.5	2.0
Winter Flounder, GOM	0.2	0.1	0.5	0.1	1.2	0.2
Winter Flounder, SNE	0.0	0.0	0.0	0.0	0.0	0.0
Witch Flounder	1.1	0.8	1.7	1.1	2.2	1.0
Yellowtail Flounder, CC/GOM	1.2	0.8	1.5	1.1	1.8	1.4
Yellowtail Flounder, GB	1.1	0.9	1.6	1.3	0.6	0.3
Yellowtail Flounder, SNE	0.4	0.2	0.6	0.6	0.9	0.4

* "Lbs. available" refers to the amount of ACE/PSC (in live lbs.) available to be leased in across all MRIs.

** "Lbs. leased in" refers to the amount of ACE/PSC (in live lbs.) that had to be leased in for those MRIs where catch exceeded allocated PSC for a particular stock. For those MRIs where catch did not exceed allocated PSC for a particular stock, lbs. leased in was 0.0 for that stock.

Table 20 (continued). ACE and PSC lease markets by stock (millions of live pounds) and fishing year.

Stock	2013 Lbs. available*	2013 Lbs. leased in**	2014 Lbs. available*	2014 Lbs. leased in**	2015 Lbs. available*	2015 Lbs. leased in**
Cod, GB East	0.2	0.0	0.3	0.1	0.2	0.1
Cod, GB West	2.7	2.3	2.6	1.9	2.6	2.4
Cod, GOM	1.3	1.0	1.3	0.9	0.3	0.3
Haddock, GB East	7.1	0.1	18.9	0.4	36.5	0.0
Haddock, GB West	45.0	0.3	10.9	3.3	5.8	5.6
Haddock, GOM	0.3	0.2	0.7	0.5	1.6	1.1
Plaice	2.2	2.2	2.1	1.9	2.2	2.1
Pollock	21.8	3.9	23.9	3.2	25.4	1.6
Redfish	18.3	4.6	18.3	5.0	18.8	6.2
White hake	6.2	2.2	7.4	1.8	7.7	1.6
Winter flounder, GB	5.6	1.6	5.7	0.7	3.1	0.9
Winter Flounder, GOM	1.3	0.1	1.3	0.1	0.7	0.1
Winter Flounder, SNE	1.4	0.5	1.7	0.4	1.8	0.5
Witch Flounder	0.9	1.0	0.9	0.7	0.9	0.7
Yellowtail Flounder, CC/GOM	0.8	0.6	0.8	0.3	0.8	0.6
Yellowtail Flounder, GB	0.3	0.1	0.5	0.1	0.4	0.0
Yellowtail Flounder, SNE	0.8	0.3	0.7	0.4	0.8	0.1

* "Lbs. available" refers to the amount of ACE/PSC (in live lbs.) available to be leased in across all MRIs.

** "Lbs. leased in" refers to the amount of ACE/PSC (in live lbs.) that had to be leased in for those MRIs where catch exceeded allocated PSC for a particular stock. For those MRIs where catch did not exceed allocated PSC for a particular stock, lbs. leased in was 0.0 for that stock.

Table 21. Total allocated ACE (in millions of live pounds) and catch (in millions of live pounds) by vessel size category and fishing year.

Vessel Size Category	2010 Allocated ACE (lbs.)	2010 Allocated ACE (% of total)	2010 Catch (lbs.)	2010 Catch (% of total)	2011 Allocated ACE (lbs.)	2011 Allocated ACE (% of total)	2011 Catch (lbs.)	2011 Catch (% of total)
Less than 30’	41.8	23%	0.1	0%	40.1	24%	1.0	1%
30' to < 50'	24.9	14%	11.7	18%	22.4	13%	13.4	19%
50' to < 75'	38.5	21%	19.7	30%	35.9	21%	21.7	30%
75' and Above	66.4	37%	35.1	53%	56.5	33%	33.8	47%
CPH	7.8	4%	0.0	0%	15.5	9%	1.7	2%
Grand Total	**179.4**	**100%**	**66.5**	**100%**	**170.4**	**100%**	**71.6**	**100%**

Table 21 (continued). Total allocated ACE (in millions of live pounds) and catch (in millions of live pounds) by vessel size category and fishing year.

Vessel Size Category	2012 Allocated ACE (lbs.)	2012 Allocated ACE (% of total)	2012 Catch (lbs.)	2012 Catch (% of total)	2013 Allocated ACE (lbs.)	2013 Allocated ACE (% of total)	2013 Catch (lbs.)	2013 Catch (% of total)
Less than 30’	39.1	24%	0.4	1%	28.3	20%	0.5	1%
30' to < 50'	21.7	13%	9.0	17%	17.0	12%	6.4	13%
50' to < 75'	34.9	21%	16.7	31%	34.1	24%	15.5	33%
75' and Above	56.5	34%	27.0	51%	47.1	33%	25.0	53%
CPH	13.7	8%	0.0	0%	15.9	11%	0.0	0%
Grand Total	**165.9**	**100%**	**53.2**	**100%**	**142.3**	**100%**	**47.3**	**100%**

Table 21 (continued). Total allocated ACE (in millions of live pounds) and catch (in millions of live pounds) by vessel size category and fishing year.

Vessel Size Category	2014 Allocated ACE (lbs.)	2014 Allocated ACE (% of total)	2014 Catch (lbs.)	2014 Catch (% of total)	2015 Allocated ACE (lbs.)	2015 Allocated ACE (% of total)	2015 Catch (lbs.)	2015 Catch (% of total)
Less than 30’	22.6	18%	0.2	0%	18.3	14%	0.0	0%
30' to < 50'	15.9	13%	4.9	10%	15.0	11%	3.9	8%
50' to < 75'	28.7	23%	17.7	36%	29.2	22%	17.2	37%
75' and Above	37.3	30%	25.8	53%	39.9	30%	25.8	55%
CPH	20.3	16%	0.0	0%	30.2	23%	0.0	0%
Grand Total	**124.7**	**100%**	**48.5**	**100%**	**132.6**	**100%**	**47.0**	**100%**

Table 22. Volume of between-sector ACE leases (in millions of live pounds) by stock and fishing year.

Stock	2010	2011	2012	2013	2014	2015
Cod, GB East	0.1	0.2	0.1	0.1	0.1	0.1
Cod, GB West	2.1	2.8	2.1	1.3	1.3	1.4
Cod, GOM	2.1	2.8	1.7	0.6	0.8	0.2
Haddock, GB East	0.9	0.4	1.4	0.4	0.2	0.4
Haddock, GB West	1.8	1.3	3.6	2.4	0.2	1.5
Haddock, GOM	0.5	0.7	0.3	0.1	0.2	0.6
Plaice	0.8	0.7	1.4	1.5	1.0	1.1
Pollock	3.2	3.4	3.4	2.7	1.5	1.9
Redfish	1.1	0.5	2.4	3.4	2.4	4.0
White hake	1.4	2.3	1.7	0.9	0.7	1.0
Winter flounder, GB	0.2	0.5	0.7	0.6	0.2	0.3
Winter flounder, GOM	0.1	0.1	0.3	0.1	0.0	0.0
Winter flounder, SNE	0.0	0.0	0.0	0.5	0.2	0.2
Witch flounder	0.4	0.7	0.9	0.4	0.4	0.4
Yellowtail flounder, CC/GOM	0.4	0.7	0.8	0.4	0.2	0.5
Yellowtail flounder, GB	0.2	0.6	0.2	0.1	0.0	0.0
Yellowtail flounder, SNE	0.1	0.3	0.5	0.3	0.3	0.3
Grand Total	**15.7**	**17.8**	**21.5**	**15.8**	**9.9**	**14.0**

Table 23. Number of between-sector ACE lease transactions by month and fishing year.

Month	2010 Number of leases	2010 Number of leases with compensation reported	2010 Number of leases validated for model*	2011 Number of leases	2011 Number of leases with compensation reported	2011 Number of leases validated for model*	2012 Number of leases	2012 Number of leases with compensation reported	2012 Number of leases validated for model*
May	0	0	0	125	125	37	81	80	52
June	30	0	0	107	107	74	124	124	72
July	138	17	2	72	72	32	179	179	64
August	59	0	0	171	171	98	147	147	108
September	67	0	0	70	70	47	64	64	47
October	127	25	7	140	140	109	109	109	88
November	65	65	12	75	75	62	62	62	45
December	101	101	23	118	118	73	110	110	93
January	70	70	37	140	140	105	53	53	36
February	115	115	63	111	111	78	63	63	25
March	93	93	64	151	151	105	51	51	33
April	82	82	56	84	84	76	17	17	12
Grand Total	**947**	**568**	**264**	**1,364**	**1,364**	**896**	**1,060**	**1,059**	**675**

*Leases were validated in the case of fish-for-cash trades if positive compensation values were reported. Leases were validated in the case of stock swaps if the estimated lease prices fell within two standard deviations of the fish-for-cash price estimates.

Table 23 (continued). Number of between-sector ACE lease transactions by month and fishing year.

Month	2013 Number of leases	2013 Number of leases with compensation reported	2013 Number of leases validated for model*	2014 Number of leases	2014 Number of leases with compensation reported	2014 Number of leases validated for model*	2015 Number of leases	2015 Number of leases with compensation reported	2015 Number of leases validated for model*
May	100	100	35	36	36	21	108	108	42
June	237	237	204	99	99	58	101	101	70
July	171	171	97	122	122	93	61	61	52
August	157	157	80	71	71	54	131	131	54
September	47	47	24	111	111	48	109	109	84
October	96	96	60	90	90	71	40	40	33
November	49	49	39	31	31	26	72	72	62
December	85	85	55	66	66	60	53	53	36
January	142	142	105	74	74	37	115	115	86
February	47	47	36	41	41	37	52	52	38
March	41	41	36	32	32	26	79	79	67
April	52	52	47	40	40	30	63	63	42
Grand Total	**1,224**	**1,224**	**818**	**813**	**813**	**561**	**984**	**984**	**666**

*Leases were validated in the case of fish-for-cash trades if positive compensation values were reported. Leases were validated in the case of stock swaps if the estimated lease prices lay within two standard deviations of the fish-for-cash price estimates.

Table 24. ACE lease prices (in 2010 dollars per live pound) resulting from hedonic model, by stock and fishing year.[54]

Stock	2010 Value ($/live lb)	2010 Standard error	2010 p value	2011 Value ($/live lb)	2011 Standard error	2011 p value	2012 Value ($/live lb)	2012 Standard error	2012 p value
Cod, GB East	$0.98	0.14	***	$1.26	0.15	***	$2.47	0.38	***
Cod, GB West	$0.84	0.03	***	$0.65	0.01	***	$0.44	0.03	***
Cod, GOM	$1.07	0.04	***	$1.09	0.02	***	$0.68	0.03	***
Haddock, GB East	NA	NA	NA	NA	NA	NA	NA	NA	NA
Haddock, GB West	NA	NA	NA	NA	NA	NA	NA	NA	NA
Haddock, GOM	$0.93	0.04	***	$0.47	0.05	***	$0.36	0.13	***
Plaice	$0.48	0.07	***	$0.09	0.03	***	$0.11	0.04	**
Pollock	NA	NA	NA	$0.06	0.01	***	$0.05	0.02	**
Redfish	$0.00	0.23	NS	$0.25	0.06	***	$0.03	0.01	***
White hake	$0.34	0.03	***	$0.46	0.02	***	$0.69	0.03	***
Winter flounder, GB	$0.00	1.72	NS	$0.76	0.07	***	$0.58	0.03	***
Winter flounder, GOM	$0.00	0.59	NS	$0.71	0.23	***	$0.36	0.10	***
Winter flounder, SNE/MA*	NA	NA	NA	NA	NA	NA	NA	NA	NA
Witch flounder	$1.23	0.15	***	$0.67	0.07	***	$0.69	0.06	***
Yellowtail flounder, CC/GOM	$0.52	0.14	***	$0.41	0.06	***	$0.63	0.06	***
Yellowtail flounder, GB	$0.92	0.29	***	$0.24	0.05	***	$0.96	0.11	***
Yellowtail flounder, SNE/MA	$0.85	0.16	***	$0.36	0.10	***	$0.76	0.07	***

*SNE/MA winter flounder was not allocated in FY2010 – FY2012.
P values indicate whether the price ($/live lb.) generated for each stock was statistically significantly different from $0.00.
"NS" indicates that a price was not statistically significantly different from $0.00 (the p value was not < 0.05).
**p < 0.05
***p < 0.01

Hedonic Model	2010	2011	2012
Number of Observations	171	502	306
R-squared	0.90	0.93	0.91

Table 24 (continued). ACE lease prices (in 2010 dollars per live pound) resulting from hedonic model, by stock and fishing year. [55]

[54] In some instances, we were unable to estimate lease prices for certain stocks when the necessary leasing data was unavailable. In these cases, values are depicted as "NA."

Stock	2013 Value ($/live lb)	2013 Standard error	2013 p value	2014 Value ($/live lb)	2014 Standard error	2014 p value	2015 Value ($/live lb)	2015 Standard error	2015 p value
Cod, GB East	NA	NA	NA	$0.65	0.14	***	$0.00	0.43	NS
Cod, GB West	$0.36	0.02	***	$0.52	0.02	***	$0.18	0.05	***
Cod, GOM	$1.22	0.06	***	$0.69	0.05	***	$2.29	1.07	**
Haddock, GB East	NA	NA	NA	NA	NA	NA	NA	NA	NA
Haddock, GB West	NA	NA	NA	NA	NA	NA	NA	NA	NA
Haddock, GOM	$0.58	0.12	***	$0.86	0.13	***	$0.35	0.14	**
Plaice	$0.14	0.01	***	$0.56	0.04	***	$1.18	0.15	***
Pollock	$0.00	0.01	NS	$0.12	0.04	***	$0.00	0.04	***
Redfish	$0.00	0.00	NS	$0.00	0.01	**	$0.00	0.02	NS
White hake	$0.14	0.02	***	$0.12	0.03	***	$0.00	0.10	***
Winter flounder, GB	$0.26	0.02	***	$0.11	0.03	***	$0.00	0.12	NS
Winter flounder, GOM	$0.00	0.34	NS	$0.00	0.21	NS	$0.00	0.77	NS
Winter flounder, SNE/MA	$0.43	0.03	***	$0.00	0.19	NS	0.00	0.23	NS
Witch flounder	$0.63	0.06	***	$1.14	0.12	***	$1.86	0.42	***
Yellowtail flounder, CC/GOM	$0.71	0.06	***	$0.81	0.16	***	$0.44	0.16	***
Yellowtail flounder, GB	$0.00	0.24	NS	$0.00	0.22	NS	$0.00	1.50	**
Yellowtail flounder, SNE/MA	$0.39	0.06	***	$0.38	0.08	***	$0.00	0.28	NS

P values indicate whether the price ($/live lb.) generated for each stock was statistically significantly different from $0.00.
"NS" indicates that a price was not statistically significantly different from $0.00 (the p value was not < 0.05).
**p < 0.05
***p < 0.01

Hedonic Model	2013	2014	2015
Number of Observations	408	340	444
R-squared	0.94	0.92	0.89

[55] In some instances, we were unable to estimate lease prices for certain stocks when the necessary leasing data was unavailable. In these cases, values are depicted as "NA."

Table 25. ACE lease prices (in 2010 dollars per live pound) from weighted mean values for single-stock leases[56] by fishing year.

Stock	2010 n	2010 Price ($/live lb.)	2010 Standard Deviation	2011 n	2011 Price ($/live lb.)	2011 Standard Deviation	2012 n	2012 Price ($/live lb.)	2012 Standard Deviation
Cod, GB East	9	$0.93	0.06	26	$1.13	0.59	7	$1.33	1.00
Cod, GB West	24	$0.80	0.09	39	$0.64	0.20	17	$0.27	0.23
Cod, GOM	36	$1.02	0.35	81	$0.99	0.28	30	$0.46	0.29
Haddock, GB East	NA	NA	NA	NA	NA	NA	NA	NA	NA
Haddock, GB West	NA	NA	NA	NA	NA	NA	NA	NA	NA
Haddock, GOM	4	$0.82	0.34	33	$0.45	0.11	11	$0.29	0.10
Plaice	1	$0.15	NA**	9	$0.09	0.07	7	$0.05	0.03
Pollock	NA	NA	NA	11	$0.06	0.07	4	$0.01	0.01
Redfish	3	$0.09	0.53	1	$0.27	.	13	$0.02	0.02
White hake	23	$0.31	0.16	84	$0.46	0.19	36	$0.75	0.27
Winter flounder, GB	1	$0.85	NA**	9	$0.76	0.41	3	$0.55	0.07
Winter flounder, GOM	12	$0.71	0.46	19	$0.72	0.26	14	$0.29	0.08
Winter flounder, SNE/MA*	NA	NA	NA	NA	NA	NA	NA	NA	NA
Witch flounder	15	$1.07	0.30	44	$0.66	0.26	27	$0.62	0.10
Yellowtail flounder, CC/GOM	8	$0.53	0.22	51	$0.41	0.13	55	$0.54	0.09
Yellowtail flounder, GB	3	$0.89	0.19	16	$0.30	0.23	10	$0.77	0.46
Yellowtail flounder, SNE/MA	6	$0.76	0.17	21	$0.39	0.11	24	$0.60	0.16

* SNE/MA winter flounder was not allocated during FY2010 – FY2012.
**Standard deviations are not applicable in cases where there is only one observation.

[56] Single-stock leases refer to leases in which one stock is transferred for single-value cash compensation. In some instances, we were unable to estimate lease prices for certain stocks when the necessary leasing data was unavailable. In these cases, values are depicted as "NA."

Table 25 (continued). ACE lease prices (in 2010 dollars per live pound) from weighted mean values for single-stock leases[57] by fishing year.

Stock	2013 n	2013 Price ($/live lb.)	2013 Standard Deviation	2014 n	2014 Price ($/live lb.)	2014 Standard Deviation	2015 n	2015 Price ($/live lb.)	2015 Standard Deviation
Cod, GB East	NA	NA	NA	12	$0.52	0.23	21	$0.47	0.16
Cod, GB West	22	$0.31	0.18	38	$0.51	0.15	68	$0.35	0.10
Cod, GOM	47	$1.36	0.49	54	$0.93	0.53	66	$2.80	1.33
Haddock, GB East	NA	NA	NA	NA	NA	NA	NA	NA	NA
Haddock, GB West	1	$0.91	NA**	1	$0.88	NA**	1	$0.55	NA**
Haddock, GOM	31	$0.81	0.43	35	$0.89	0.44	44	$0.42	0.15
Plaice	57	$0.26	0.22	37	$0.63	0.30	55	$0.98	0.37
Pollock	4	$0.01	0.01	3	$0.00	0.00	NA	NA	NA
Redfish	12	$0.01	0.00	5	$0.01	0.01	13	$0.02	0.00
White hake	13	$0.21	0.16	10	$0.08	0.03	12	$0.04	0.03
Winter flounder, GB	4	$0.27	0.01	2	$0.10	0.05	7	$0.05	0.00
Winter flounder, GOM	2	$0.05	0.67	3	$0.05	0.00	1	$0.05	NA**
Winter flounder, SNE/MA	32	$0.49	0.07	9	$0.33	0.08	12	$0.17	0.09
Witch flounder	47	$0.85	0.52	37	$1.04	0.51	53	$1.25	0.15
Yellowtail flounder, CC/GOM	37	$0.86	0.32	15	$0.63	0.22	39	$0.37	0.10
Yellowtail flounder, GB	6	$0.88	0.71	8	$0.42	0.22	NA	NA	NA
Yellowtail flounder, SNE/MA	34	$0.47	0.07	32	$0.42	0.15	20	$0.33	0.20

**Standard deviations are not applicable in cases where there is only one observation.

[57] Single-stock leases refer to leases in which one stock is transferred for single-value cash compensation. In some instances, we were unable to estimate lease prices for certain stocks when the necessary leasing data was unavailable. In these cases, values are depicted as "NA."

Table 26. Ex-vessel[58] and ACE lease prices (from hedonic model, in 2010 dollars per live pound) by stock and fishing year.

Stock	2010 Ex-vessel price	2010 ACE lease price	2010 ACE lease price/ ex-vessel price	2011 Ex-vessel price	2011 ACE lease price	2011 ACE lease price/ ex-vessel price	2012 Ex-vessel price	2012 ACE lease price	2012 ACE lease price/ ex-vessel price
Cod, GB East	$1.83	$0.98	53%	$1.86	$1.26	68%	$2.13	$2.47	116%
Cod, GB West	$1.83	$0.84	46%	$1.86	$0.65	35%	$2.13	$0.44	20%
Cod, GOM	$1.62	$1.07	66%	$1.93	$1.09	57%	$2.61	$0.68	26%
Haddock, GB East	$1.08	NA	NA	$1.45	NA	NA	$1.93	NA	NA
Haddock, GB West	$1.08	NA	NA	$1.45	NA	NA	$1.93	NA	NA
Haddock, GOM	$2.13	$0.93	44%	$2.28	$0.47	21%	$2.57	$0.36	14%
Plaice	$1.45	$0.48	33%	$1.42	$0.09	6%	$1.62	$0.11	7%
Pollock	$0.85	NA	NA	$0.82	$0.06	7%	$0.95	$0.05	5%
Redfish	$0.57	$0.00	0%	$0.65	$0.25	39%	$0.57	$0.03	6%
White hake	$1.14	$0.34	30%	$1.08	$0.46	43%	$1.50	$0.69	46%
Winter flounder, GB	$1.98	$0.00	0%	$1.76	$0.76	43%	$1.98	$0.58	29%
Winter flounder, GOM	$1.74	$0.00	0%	$1.52	$0.71	47%	$2.03	$0.36	18%
Winter flounder, SNE/MA	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*
Witch flounder	$2.42	$1.23	51%	$1.98	$0.67	34%	$1.97	$0.69	35%
Yellowtail flounder, CC/GOM	$1.18	$0.52	44%	$0.90	$0.41	45%	$1.47	$0.63	43%
Yellowtail flounder, GB	$1.28	$0.92	72%	$1.25	$0.24	19%	$1.34	$0.96	72%
Yellowtail flounder, SNE/MA	$1.40	$0.85	61%	$1.61	$0.36	22%	$1.73	$0.76	44%

* SNE/MA winter flounder was not allocated during FY2010 – FY2012.

[58] In order to properly compare ex-vessel prices with ACE leasing prices, ex-vessel prices were converted from price per landed pound to price per live pound. In some instances, we were unable to estimate lease prices for certain stocks when the necessary leasing data was unavailable. In these cases, values are depicted as "NA."

Table 26 (continued). Ex-vessel[59] and ACE lease prices (from hedonic model, in 2010 dollars per live pound) by stock and fishing year.

Stock	2013 Ex-vessel price	2013 ACE lease price	2013 ACE lease price/ Ex-vessel price	2014 Ex-vessel price	2014 ACE lease price	2014 ACE lease price/ Ex-vessel price	2015 Ex-vessel price	2015 ACE lease price	2015 ACE lease price/ Ex-vessel price
Cod, GB East	$1.91	NA	NA	$1.57	$0.65	41%	$1.56	$0.00	0%
Cod, GB West	$1.91	$0.36	19%	$1.57	$0.52	33%	$1.56	$0.18	11%
Cod, GOM	$2.68	$1.22	46%	$1.98	$0.69	35%	$2.12	$2.29	108%
Haddock, GB East	$1.23	NA	NA	$0.98	NA	NA	$0.95	NA	NA
Haddock, GB West	$1.23	NA	NA	$0.98	NA	NA	$0.95	NA	NA
Haddock, GOM	$2.27	$0.58	26%	$1.65	$0.86	52%	$1.17	$0.35	30%
Plaice	$1.56	$0.14	9%	$1.72	$0.56	33%	$1.89	$1.18	63%
Pollock	$1.05	$0.00	0%	$1.11	$0.12	11%	$1.03	$0.00	0%
Redfish	$0.53	$0.00	0%	$0.56	$0.00	0%	$0.59	$0.00	0%
White hake	$1.50	$0.14	10%	$1.43	$0.12	9%	$1.31	$0.00	0%
Winter flounder, GB	$1.65	$0.26	16%	$1.95	$0.11	6%	$2.11	$0.00	0%
Winter flounder, GOM	$1.79	0.00	0%	$1.62	$0.00	0%	$1.61	$0.00	0%
Winter flounder, SNE/MA	$1.32	$0.43	33%	$1.91	$0.00	0%	$2.34	$0.00	0%
Witch flounder	$2.43	$0.63	26%	$2.68	$1.14	43%	$2.69	$1.86	69%
Yellowtail flounder, CC/GOM	$1.16	$0.71	61%	$1.63	$0.81	50%	$0.90	$0.44	49%
Yellowtail flounder, GB	$1.12	$0.00	0%	$1.10	$0.00	0%	$1.24	$0.00	0%
Yellowtail flounder, SNE/MA	$1.66	$0.39	23%	$1.72	$0.38	22%	$2.18	$0.00	0%

[59] In order to properly compare ex-vessel prices with ACE leasing prices, ex-vessel prices were converted from price per landed pound to price per live pound. In some instances, we were unable to estimate lease prices for certain stocks when the necessary leasing data was unavailable. In these cases, values are depicted as "NA."

Table 27. Transfer payments from ACE and PSC leasing at the MRI level (from hedonic model, in millions of live pounds; millions of 2010 dollars) by stock and fishing year.[60]

Stock	2010 Total pounds leased in	2010 Lease price ($/live lb)	2010 Estimated total transfer payments	2011 Total pounds leased in	2011 Lease price ($/live lb)	2011 Estimated total transfer payments	2012 Total pounds leased in	2012 Lease price ($/live lb)	2012 Estimated total transfer payments
Cod, GB East	0.4	$0.98	$0.3	0.2	$1.26	$0.3	0.1	$2.47	$0.2
Cod, GB West	3.3	$0.84	$2.8	3.9	$0.65	$2.5	1.0	$0.44	$0.5
Cod, GOM	4.0	$1.07	$4.3	5.1	$1.09	$5.6	2.2	$0.68	$1.5
Haddock, GB East	0.5	NA	NA	0.0	NA	NA	0.0	NA	NA
Haddock, GB West	1.1	NA	NA	0.2	NA	NA	0.0	NA	NA
Haddock, GOM	0.4	$0.93	$0.4	0.6	$0.47	$0.3	0.2	$0.36	$0.1
Plaice	1.5	$0.48	$0.7	1.7	$0.09	$0.1	1.5	$0.11	$0.2
Pollock	3.3	NA	NA	6.1	$0.06	$0.3	5.2	$0.05	$0.2
Redfish	1.5	$0.00	$0.0	2.4	$0.25	$0.6	4.9	$0.03	$0.2
White hake	2.8	$0.34	$0.9	4.2	$0.46	$1.9	2.8	$0.69	$1.9
Winter flounder, GB	1.7	$0.00	$0.0	2.6	$0.76	$2.0	2.0	$0.58	$1.2
Winter flounder, GOM	1.0	$0.00	$0.0	0.1	$0.71	$0.1	0.2	$0.36	$0.1
Winter flounder, SNE/MA	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*
Witch flounder	0.8	$1.23	$1.0	1.1	$0.67	$0.8	1.0	$0.69	$0.7
Yellowtail flounder, CC/GOM	0.8	$0.52	$0.4	1.1	$0.41	$0.4	1.4	$0.63	$0.9
Yellowtail flounder, GB	0.9	$0.92	$0.9	1.3	$0.24	$0.3	0.3	$0.96	$0.3
Yellowtail flounder, SNE/MA	0.2	$0.85	$0.2	0.6	$0.36	$0.2	0.4	$0.76	$0.3
Grand Total	**23.2**	**NA**	**$11.9**	**31.3**	**NA**	**$15.5**	**23.3**	**NA**	**$8.2**

*SNE/MA winter flounder was not allocated during FY2010 – FY2012.

[60] In some instances, we were unable to estimate lease prices for certain stocks when the necessary leasing data was unavailable. In these cases, values are depicted as "NA."

Table 27 (continued). Transfer payments from ACE and PSC leasing at the MRI level (from hedonic model, in millions of live pounds; millions of 2010 dollars) by stock and fishing year.[61]

Stock	2013 Total pounds leased in	2013 Lease price ($/live lb)	2013 Estimated total transfer payments	2014 Total pounds leased in	2014 Lease price ($/live lb)	2014 Estimated total transfer payments	2015 Total pounds leased in	2015 Lease price ($/live lb)	2015 Estimated total transfer payments
Cod, GB East	0.0	NA	NA	0.1	$0.65	$0.1	0.1	$0.00	$0.0
Cod, GB West	2.3	$0.36	$0.8	1.9	$0.52	$1.0	2.4	$0.18	$0.4
Cod, GOM	1.0	$1.22	$1.3	0.9	$0.69	$0.7	0.3	$2.29	$0.7
Haddock, GB East	0.1	NA	NA	0.4	NA	NA	0.0	$0.00	$0.0
Haddock, GB West	0.3	NA	NA	3.3	NA	NA	5.6	$0.00	$0.0
Haddock, GOM	0.2	$0.58	$0.1	0.5	$0.86	$0.4	1.1	$0.35	$0.4
Plaice	2.2	$0.14	$0.3	1.9	$0.56	$1.1	2.1	$1.18	$2.4
Pollock	3.9	$0.00	$0.0	3.2	$0.12	$0.4	1.6	$0.00	$0.0
Redfish	4.6	$0.00	$0.0	5.0	$0.00	$0.0	6.2	$0.00	$0.0
White hake	2.2	$0.14	$0.3	1.8	$0.12	$0.2	1.6	$0.00	$0.0
Winter flounder, GB	1.6	$0.26	$0.4	0.7	$0.11	$0.1	0.9	$0.00	$0.0
Winter flounder, GOM	0.1	$0.00	$0.0	0.1	$0.00	$0.0	0.1	$0.00	$0.0
Winter flounder, SNE/MA	0.5	NA	NA	0.4	$0.00	$0.0	0.5	$0.00	$0.0
Witch flounder	1.0	$0.63	$0.6	0.7	$1.14	$0.8	0.7	$1.86	$1.4
Yellowtail flounder, CC/GOM	0.6	$0.71	$0.4	0.3	$0.81	$0.3	0.6	$0.44	$0.2
Yellowtail flounder, GB	0.1	$0.00	$0.0	0.1	$0.00	$0.0	0.0	$0.00	$0.0
Yellowtail flounder, SNE/MA	0.3	$0.39	$0.1	0.4	$0.38	$0.1	0.1	$0.00	$0.0
Grand Total	**21.0**	**NA**	**$4.4**	**21.7**	**NA**	**$5.0**	**23.9**	**NA**	**$5.5**

[61] In some instances, we were unable to estimate lease prices for certain stocks when the necessary leasing data was unavailable. In these cases, values are depicted as "NA."

Table 28. Transfer payments from ACE and PSC leasing at the vessel affiliation level (from hedonic model, in millions of live pounds; millions of 2010 dollars) by stock and fishing year.[62]

Stock	2010 Total pounds leased in	2010 Lease price ($/live lb)	2010 Estimated total transfer payments	2011 Total pounds leased in	2011 Lease price ($/live lb)	2011 Estimated total transfer payments	2012 Total pounds leased in	2012 Lease price ($/live lb)	2012 Estimated total transfer payments
Cod, GB East	0.3	$0.98	$0.2	0.2	$1.26	$0.2	0.0	$2.47	$0.1
Cod, GB West	2.2	$0.84	$1.8	2.4	$0.65	$1.6	0.3	$0.44	$0.1
Cod, GOM	2.3	$1.07	$2.4	3.0	$1.09	$3.3	1.2	$0.68	$0.8
Haddock, GB East	0.0	NA	NA	NA	NA	NA	NA	NA	NA
Haddock, GB West	0.0	NA	NA	0.0	NA	NA	0.0	NA	NA
Haddock, GOM	0.3	$0.93	$0.2	0.5	$0.47	$0.2	0.1	$0.36	$0.0
Plaice	0.6	$0.48	$0.3	0.7	$0.09	$0.1	0.6	$0.11	$0.1
Pollock	0.6	NA	NA	2.1	$0.06	$0.1	2.2	$0.05	$0.1
Redfish	0.3	$0.00	$0.0	0.7	$0.25	$0.2	2.3	$0.03	$0.1
White hake	1.3	$0.34	$0.4	2.7	$0.46	$1.2	1.5	$0.69	$1.0
Winter flounder, GB	0.6	$0.00	$0.0	1.7	$0.76	$1.3	0.6	$0.58	$0.3
Winter flounder, GOM	0.1	$0.00	$0.0	0.1	$0.71	$0.1	0.1	$0.36	$0.1
Winter flounder, SNE/MA	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*
Witch flounder	0.4	$1.23	$0.5	0.6	$0.67	$0.4	0.6	$0.69	$0.4
Yellowtail flounder, CC/GOM	0.5	$0.52	$0.3	0.7	$0.41	$0.3	0.9	$0.63	$0.6
Yellowtail flounder, GB	0.6	$0.92	$0.5	1.0	$0.24	$0.2	0.2	$0.96	$0.2
Yellowtail flounder, SNE/MA	0.2	$0.85	$0.1	0.5	$0.36	$0.2	0.4	$0.76	$0.3
Grand Total	**10.1**	**NA**	**$6.9**	**16.8**	**NA**	**$9.3**	**10.9**	**NA**	**$4.1**

*SNE/MA winter flounder was not allocated in FY2010 – FY2012.

[62] In some instances, we were unable to estimate lease prices for certain stocks when the necessary leasing data was unavailable. In these cases, values are depicted as "NA."

Table 28 (continued). Transfer payments from ACE and PSC leasing at the vessel affiliation level (from hedonic model, in millions of live pounds; millions of 2010 dollars) by stock and fishing year.[63]

Stock	2013 Total pounds leased in	2013 Lease price ($/live lb)	2013 Estimated total transfer payments	2014 Total pounds leased in	2014 Lease price ($/live lb)	2014 Estimated total transfer payments	2015 Total pounds leased in	2015 Lease price ($/live lb)	2015 Estimated total transfer payments
Cod, GB East	0.0	NA	NA	0.1	$0.65	$0.0	0.1	$0.00	$0.0
Cod, GB West	1.6	$0.36	$0.6	1.3	$0.52	$0.7	2.0	$0.18	$0.4
Cod, GOM	0.8	$1.22	$1.0	0.7	$0.69	$0.5	0.2	$2.29	$0.6
Haddock, GB East	NA	NA	NA	0.1	NA	NA	0.0	$0.00	$0.0
Haddock, GB West	0.2	NA	NA	1.0	NA	NA	1.9	$0.00	$0.0
Haddock, GOM	0.2	$0.58	$0.1	0.3	$0.86	$0.2	0.9	$0.35	$0.3
Plaice	1.5	$0.14	$0.2	1.3	$0.56	$0.7	1.7	$1.18	$2.0
Pollock	2.1	$0.00	$0.0	1.3	$0.12	$0.2	0.9	$0.00	$0.0
Redfish	1.8	$0.00	$0.0	2.3	$0.00	$0.0	4.4	$0.00	$0.0
White hake	1.0	$0.14	$0.1	0.7	$0.12	$0.1	0.9	$0.00	$0.0
Winter flounder, GB	0.6	$0.26	$0.2	0.4	$0.11	$0.0	0.5	$0.00	$0.0
Winter flounder, GOM	0.1	$0.00	$0.0	0.1	$0.00	$0.0	0.1	$0.00	$0.0
Winter flounder, SNE/MA	0.3	$0.43	$0.1	0.2	$0.00	$0.0	0.3	$0.00	$0.0
Witch flounder	0.7	$0.63	$0.4	0.5	$1.14	$0.5	0.6	$1.86	$1.1
Yellowtail flounder, CC/GOM	0.4	$0.71	$0.3	0.3	$0.81	$0.2	0.5	$0.44	$0.2
Yellowtail flounder, GB	0.0	$0.00	$0.0	0.0	$0.00	$0.0	0.0	$0.00	$0.0
Yellowtail flounder, SNE/MA	0.2	$0.39	$0.1	0.3	$0.38	$0.1	0.1	$0.00	$0.0
Grand Total	**11.7**	**NA**	**$3.1**	**10.6**	**NA**	**$3.3**	**18.1**	**NA**	**$4.5**

[63] In some instances, we were unable to estimate lease prices for certain stocks when the necessary leasing data was unavailable. In these cases, values are depicted as "NA."

Table 29. Transfer payments (in millions of 2010 dollars) from ACE and PSC leasing by lessee home port state/city and fishing year.

Home Port State/City*	2010 Total transfer payments between MRIs		2010 Total transfer payments between vessel affiliations		2011 Total transfer payments between MRIs		2011 Total transfer payments between vessel affiliations		2012 Total transfer payments between MRIs		2012 Total transfer payments between vessel affiliations	
	n	*Value*	*n*	*Value*	*n*	*Value*	*n*	*Value*	*n*	*Value*	*n*	*Value*
MA	170	$9.2	111	$4.6	155	$11.9	99	$6.7	152	$5.8	97	$2.4
BOSTON	31	$1.8	12	$0.4	31	$3.2	12	$0.7	25	$1.5	9	$0.4
CHATHAM	25	$0.5	19	$0.5	18	$0.6	16	$0.6	17	$0.1	15	$0.1
GLOUCESTER	51	$2.7	42	$1.6	48	$2.3	43	$2.3	47	$1.1	39	$0.9
NEW BEDFORD	28	$2.8	12	$1.6	32	$4.1	12	$2.5	32	$2.2	12	$0.6
ME	34	$1.7	28	$1.1	36	$1.9	29	$1.4	38	$1.5	32	$1.0
PORTLAND	11	$1.0	9	$0.6	10	$1.1	9	$0.9	12	$0.9	10	$0.6
NH	19	$0.5	17	$0.7	18	$0.8	15	$0.7	15	$0.3	12	$0.2
RI & CT	29	$0.5	29	$0.4	26	$0.5	27	$0.4	32	$0.5	30	$0.4
POINT JUDITH	22	$0.4	22	$0.4	21	$0.4	21	$0.4	25	$0.3	24	$0.4
NY & NJ	30	$0.0	26	$0.1	28	$0.1	24	$0.1	27	$0.1	22	$0.1
Other Northeast	5	$0.0	4	$0.0	10	$0.3	ND**	ND**	ND**	ND**	ND**	ND**
Grand Total	**262**	**$11.9**	**194**	**$6.9**	**249**	**$15.5**	**176**	**$9.3**	**243**	**$8.2**	**178**	**$4.1**

*Vessel affiliation assigned to the state in which the majority of permits held are home ported.

**Certain data are not disclosed for confidentiality reasons. In these cases, values are provided as "ND."

Table 29 (continued). Transfer payments (in millions of 2010 dollars) from ACE and PSC leasing by lessee home port state/city and fishing year.

Home Port State/City*	2013 Total transfer payments between MRIs		2013 Total transfer payments between vessel affiliations		2014 Total transfer payments between MRIs		2014 Total transfer payments between vessel affiliations		2015 Total transfer payments between MRIs		2015 Total transfer payments between vessel affiliations	
	n	*Value*	*n*	*Value*	*n*	*Value*	*n*	*Value*	*n*	*Value*	*n*	*Value*
MA	136	$3.2	87	$2.0	127	$3.6	75	$2.0	124	$4.4	86	$3.0
BOSTON	22	$0.8	12	$0.4	21	$1.1	8	$0.6	21	$1.9	13	$1.2
CHATHAM	18	$0.1	13	$0.1	16	$0.1	11	$0.1	15	$0.1	14	$0.1
GLOUCESTER	41	$0.9	32	$0.7	37	$1.0	28	$0.6	36	$1.4	29	$1.0
NEW BEDFORD	28	$0.9	11	$0.5	30	$1.1	11	$0.6	30	$0.7	15	$0.5
ME	35	$0.7	26	$0.7	26	$1.0	20	$0.8	22	$0.8	23	$1.3
PORTLAND	15	$0.5	11	$0.5	12	$0.8	8	$0.5	10	$0.4	11	$0.8
NH	14	$0.2	11	$0.2	14	$0.2	11	$0.1	10	$0.2	9	$0.2
RI & CT	30	$0.2	24	$0.1	26	$0.2	21	$0.2	30	$0.1	24	$0.1
POINT JUDITH	22	$0.1	18	$0.1	20	$0.1	16	$0.1	22	$0.1	19	$0.1
NY & NJ	29	$0.1	22	$0.1	26	$0.0	19	$0.1	20	$0.0	20	$0.0
Other Northeast	ND**	ND**	ND**	ND**	3	$0.0	3	$0.0	ND**	ND**	ND**	ND**
Grand Total	**224**	**$4.4**	**156**	**$3.1**	**205**	**$5.0**	**140**	**$3.3**	**194**	**$5.5**	**150**	**$4.5**

*Vessel affiliation assigned to the state in which the majority of permits held are home ported.
**Certain data are not disclosed for confidentiality reasons. In these cases, values are provided as "ND."

Table 30. Stock level catch and allocated ACE (millions of live pounds) and utilization rates by sector vessels, by fishing year.

Stock	2010 Allocated ACE	2010 Catch	2010 % ACE Caught	2011 Allocated ACE	2011 Catch	2011 % ACE Caught	2012 Allocated ACE	2012 Catch	2012 % ACE Caught
Cod, GB East	0.7	0.6	85.7%	0.4	0.4	100.0%	0.3	0.1	33.3%
Cod, GB West	6.6	5.6	84.8%	9.5	6.9	72.6%	10.3	3.3	32.0%
Cod, GOM	9.5	8.1	85.3%	10.9	9.7	89.0%	8.8	4.7	53.4%
Haddock, GB East	26.3	4.1	15.6%	21.1	2.3	10.9%	15.1	0.8	5.3%
Haddock, GB West	62.3	14.2	22.8%	50.4	6.3	12.5%	49.4	1.8	3.6%
Haddock, GOM	1.8	0.8	44.4%	1.8	1.1	61.1%	1.8	0.5	27.8%
Plaice	6.1	3.4	55.7%	6.9	3.6	52.2%	7.4	3.4	45.9%
Pollock	35.7	12.2	34.2%	31.9	16.8	52.7%	29.3	13.7	46.8%
Redfish	14.9	4.7	31.5%	17.2	6.1	35.5%	19.1	9.1	47.6%
White hake	5.5	4.8	87.3%	6.7	6.7	100.0%	7.4	5.3	71.6%
Winter flounder, GB	4.0	3.1	77.5%	4.6	4.3	93.5%	7.7	4.2	54.5%
Winter flounder, GOM	0.3	0.2	66.7%	0.6	0.3	50.0%	1.6	0.6	37.5%
Winter Flounder, SNE	NA*	NA*		NA*	NA*		NA*	NA*	
Witch Flounder	1.8	1.6	88.9%	2.8	2.2	78.6%	3.3	2.1	63.6%
Yellowtail Flounder, CC/GOM	1.6	1.3	81.3%	2.1	1.8	85.7%	2.4	2.1	87.5%
Yellowtail Flounder, GB	1.8	1.6	88.9%	2.5	2.2	88.0%	0.8	0.5	62.5%
Yellowtail Flounder, SNE	0.5	0.4	80.0%	0.9	0.9	100.0%	1.3	0.9	69.2%
Grand Total	**179.4**	**66.5**	**37.1%**	**170.4**	**71.6**	**42.0%**	**165.9**	**53.2**	**32.1%**

*SNE/MA winter flounder was not allocated in FY2010 – FY2012.

Table 30 (continued). Stock level catch and allocated ACE (millions of live pounds) and utilization rates by sector vessels, by fishing year.

Stock	2013 Allocated ACE	2013 Catch	2013 % ACE Caught	2014 Allocated ACE	2014 Catch	2014 % ACE Caught	2015 Allocated ACE	2015 Catch	2015 % ACE Caught
Cod, GB East	0.2	0.1	50.0%	0.3	0.2	66.7%	0.3	0.2	66.7%
Cod, GB West	3.8	3.3	86.8%	3.5	2.8	80.0%	3.6	3.3	91.7%
Cod, GOM	1.8	1.6	88.9%	1.8	1.4	77.8%	0.4	0.4	100.0%
Haddock, GB East	8.2	1.3	15.9%	21.9	3.4	15.5%	38.8	2.3	5.9%
Haddock, GB West	49.9	5.2	10.4%	16.1	8.5	52.8%	9.1	8.9	97.8%
Haddock, GOM	0.4	0.4	100.0%	1.0	0.7	70.0%	2.1	1.6	76.2%
Plaice	3.1	3.1	100.0%	3.0	2.8	93.3%	3.1	3.0	96.8%
Pollock	28.5	10.6	37.2%	29.1	8.4	28.9%	30.1	6.3	20.9%
Redfish	22.5	8.8	39.1%	23.4	10.1	43.2%	24.3	11.6	47.7%
White hake	8.5	4.5	52.9%	9.4	3.8	40.4%	9.5	3.5	36.8%
Winter flounder, GB	7.8	3.8	48.7%	7.5	2.5	33.3%	4.2	1.9	45.2%
Winter flounder, GOM	1.5	0.4	26.7%	1.5	0.3	20.0%	0.8	0.2	25.0%
Winter Flounder, SNE	2.4	1.5	62.5%	2.4	1.1	45.8%	2.5	1.3	52.0%
Witch Flounder	1.3	1.4	107.7%	1.3	1.1	84.6%	1.3	1.1	84.6%
Yellowtail Flounder, CC/GOM	1.0	0.8	80.0%	1.0	0.5	50.0%	1.0	0.8	80.0%
Yellowtail Flounder, GB	0.3	0.1	33.3%	0.6	0.1	16.7%	0.4	0.1	25.0%
Yellowtail Flounder, SNE	1.1	0.6	54.5%	1.0	0.7	70.0%	1.0	0.4	40.0%
Grand Total	**142.3**	**47.3**	**33.2%**	**124.7**	**48.5**	**38.9%**	**132.6**	**47.0**	**35.4%**

Table 31. Number and percentage of vessel affiliations by number of active vessels owned each fishing year.

Number of Active Vessels per Vessel Affiliation	2007	2008	2009	2010	2011	2012	2013	2014	2015
1	664 84.2%	648 85.8%	624 84.3%	596 85.4%	549 86.3%	528 85.7%	530 87.7%	526 88.1%	487 87.4%
2	92 11.7%	79 10.5%	92 12.4%	77 11.0%	59 9.3%	64 10.4%	52 8.6%	53 8.9%	54 9.7%
3	22 2.8%	15 2.0%	15 2.0%	15 2.1%	20 3.1%	15 2.4%	15 2.5%	10 1.7%	8 1.4%
4 to 6	6 0.8%	7 0.9%	6 0.8%	7 1.0%	6 0.9%	7 1.1%	5 0.8%	6 1.0%	5 0.9%
7 to 9	3 0.4%	3 0.4%	2 0.3%	2 0.3%	1 0.2%	1 0.2%	1 0.2%	1 0.2%	2 0.4%
10+	2 0.3%	3 0.4%	1 0.1%	1 0.1%	1 0.2%	1 0.2%	1 0.2%	1 0.2%	1 0.2%
Average Number of Active Vessels per Active Vessel Affiliation	1.32	1.28	1.25	1.23	1.23	1.24	1.22	1.21	1.22

Table 32. Distribution of revenue from all species (all trips) among vessels, in millions of dollars[64], by fishing year.

Earnings Bracket	2007	2008	2009	2010	2011	2012	2013	2014	2015
Top 1%	$20.0 6.5%	$18.8 6.4%	$16.1 6.0%	$18.8 6.4%	$18.6 5.7%	$18.4 6.2%	$15.8 5.9%	$17.4 6.8%	$14.8 5.5%
> 1% to 20%	$165.9 54.2%	$158.5 53.8%	$143.7 53.2%	$171.5 58.0%	$186.1 57.3%	$167.9 57.0%	$150.9 56.6%	$137.5 53.4%	$148.3 55.0%
> 20% to 40%	$67.9 22.2%	$65.9 22.4%	$60.5 22.4%	$60.8 20.6%	$70.4 21.7%	$63.1 21.4%	$61.8 23.2%	$61.2 23.7%	$64.0 23.7%
> 40% to 60%	$35.6 11.6%	$33.9 11.5%	$32.3 12.0%	$29.8 10.1%	$32.5 10.0%	$29.4 10.0%	$25.9 9.7%	$27.9 10.8%	$28.4 10.5%
> 60% to 80%	$14.9 4.9%	$15.2 5.2%	$15.3 5.7%	$13.4 4.5%	$14.6 4.5%	$13.6 4.6%	$10.4 3.9%	$11.9 4.6%	$12.4 4.6%
> 80% to 100%	$1.8 0.6%	$2.1 0.7%	$2.0 0.7%	$1.4 0.5%	$2.3 0.7%	$2.3 0.8%	$1.7 0.6%	$1.8 0.7%	$1.7 0.6%
Total Revenue	**$306.1**	**$294.4**	**$269.9**	**$295.7**	**$324.5**	**$294.7**	**$266.5**	**$257.7**	**$269.6**
Total Number of Vessels	**1039**	**966**	**923**	**857**	**781**	**762**	**734**	**722**	**678**

[64] Each category presents the incremental difference in cumulative all species revenue from the previous category. For example, by adding the revenue from all species presented for the "Top 1%" and ">1% to 20%" categories in 2007, one can obtain the total gross revenue earned by the top 20% of vessels ($185.9 million) in 2007, $20.0 million of which was earned by the top 1% of vessels.

Table 33. Distribution of revenue from groundfish (all trips) among vessels, in millions of dollars[65], by fishing year.

Earnings Bracket	2007	2008	2009	2010	2011	2012	2013	2014	2015
Top 1%	$8.7 9.5%	$8.5 9.4%	$7.6 9.0%	$8.4 10.1%	$7.5 8.5%	$5.6 8.3%	$4.4 8.0%	$5.2 9.4%	$5.4 10.6%
> 1% to 20%	$50.1 55.0%	$51.3 56.8%	$48.3 57.0%	$54.9 65.8%	$60.0 67.8%	$45.9 67.7%	$39.9 72.3%	$38.6 69.7%	$35.2 68.9%
> 20% to 40%	$20.5 22.5%	$20.2 22.4%	$19.5 23.0%	$14.8 17.7%	$15.4 17.4%	$12.4 18.3%	$8.6 15.6%	$8.8 15.9%	$7.9 15.5%
> 40% to 60%	$9.2 10.1%	$8.2 9.1%	$7.8 9.2%	$4.7 5.6%	$4.9 5.5%	$3.4 5.0%	$2.1 3.8%	$2.5 4.5%	$2.3 4.5%
> 60% to 80%	$2.5 2.7%	$2.0 2.2%	$1.5 1.8%	$0.6 0.7%	$0.7 0.8%	$0.5 0.7%	$0.2 0.4%	$0.3 0.5%	$0.3 0.6%
> 80% to 100%	$0.1 0.1%	$0.1 0.1%	$0.1 0.1%	$0.0 0.00%	$0.0 0.00%	$0.0 0.00%	$0.0 0.00%	$0.0 0.00%	$0.0 0.00%
Total Revenue	**$91.1**	**$90.3**	**$84.8**	**$83.4**	**$88.5**	**$67.8**	**$55.2**	**$55.4**	**$51.1**
Total Number of Vessels	**657**	**610**	**560**	**434**	**416**	**404**	**360**	**316**	**301**

[65] Each category presents the incremental difference in cumulative groundfish revenue from the previous category. For example, by adding the groundfish revenue presented for the "Top 1%" and ">1% to 20%" categories in 2007, one can obtain the total groundfish revenue earned by the top 20% of vessels ($58.8 million) in 2007, $8.7 million of which was earned by the top 1% of vessels.

Table 34. Distribution of revenue from all species (all trips) among vessel affiliations, in millions of dollars[66], by fishing year.

Earnings Bracket	2007	2008	2009	2010	2011	2012	2013	2014	2015
Top 1%	$59.7 19.5%	$52.1 17.7%	$46.7 17.3%	$51.8 17.5%	$59.2 18.3%	$51.9 17.6%	$49.3 18.5%	$42.1 16.3%	$45.4 16.8%
> 1% to 20%	$154.7 50.5%	$152.3 51.7%	$135.8 50.3%	$161.9 54.8%	$174.3 53.8%	$162.4 55.1%	$144.5 54.2%	$141.5 54.9%	$148.9 55.3%
> 20% to 40%	$52.7 17.2%	$51.1 17.4%	$48.7 18.0%	$46.8 15.8%	$52.1 16.1%	$46.6 15.8%	$44.8 16.8%	$43.8 17.0%	$44.3 16.4%
> 40% to 60%	$26.8 8.8%	$26.2 8.9%	$25.6 9.5%	$23.1 7.8%	$24.8 7.7%	$22.1 7.5%	$19.0 7.1%	$20.5 8.0%	$20.9 7.8%
> 60% to 80%	$11.0 3.6%	$11.2 3.8%	$11.7 4.3%	$10.8 3.7%	$11.5 3.6%	$10.2 3.5%	$7.7 2.9%	$8.5 3.3%	$8.9 3.3%
> 80% to 100%	$1.2 0.4%	$1.5 0.5%	$1.4 0.5%	$1.1 0.4%	$1.8 0.6%	$1.5 0.5%	$1.2 0.5%	$1.2 0.5%	$1.1 0.4%
Grand Total	**$306.1**	**$294.4**	**$269.9**	**$295.5**	**$323.7**	**$294.7**	**$266.5**	**$257.6**	**$269.5**
Total Number of Vessel Affiliations	**789**	**755**	**740**	**698**	**636**	**616**	**604**	**597**	**557**

[66] Each category presents the incremental difference in cumulative revenue from all species from the previous category. For example, by adding the revenue from all species presented for the "Top 1%" and ">1% to 20%" categories in 2007, one can obtain the total gross revenue earned by the top 20% of vessel affiliations ($214.4 million) in 2007, $59.7 million of which was earned by the top 1% of vessel affiliations.

Table 35. Distribution of revenue from groundfish (all trips) among vessel affiliations, in millions of dollars[67], by fishing year.

Earnings Bracket	2007	2008	2009	2010	2011	2012	2013	2014	2015
Top 1%	$23.1 25.4%	$20.2 22.3%	$19.0 22.4%	$22.1 26.5%	$23.2 26.2%	$18.3 27.0%	$15.4 28.0%	$17.0 30.6%	$15.7 30.7%
> 1% to 20%	$44.6 49.0%	$49.0 54.2%	$44.4 52.4%	$48.0 57.6%	$51.1 57.8%	$39.4 58.2%	$33.6 61.1%	$32.3 58.2%	$29.2 57.1%
> 20% to 40%	$15.3 16.8%	$14.2 15.7%	$15.0 17.7%	$9.7 11.6%	$10.3 11.7%	$7.7 11.4%	$4.6 8.4%	$4.6 8.3%	$4.5 8.8%
> 40% to 60%	$6.4 7.0%	$5.6 6.2%	$5.4 6.4%	$3.1 3.7%	$3.4 3.8%	$2.0 3.0%	$1.3 2.4%	$1.4 2.5%	$1.5 2.9%
> 60% to 80%	$1.6 1.8%	$1.3 1.4%	$0.9 1.1%	$0.4 0.5%	$0.4 0.5%	$0.3 0.4%	$0.1 0.2%	$0.2 0.4%	$0.2 0.4%
> 80% to 100%	$0.1 0.1%	$0.1 0.1%	$0.1 0.1%	$0.0 0.0%	$0.0 0.0%	$0.0 0.0%	$0.0 0.0%	$0.0 0.0%	$0.0 0.0%
Grand Total	**$91.1**	**$90.4**	**$84.8**	**$83.3**	**$88.4**	**$67.7**	**$55.0**	**$55.5**	**$51.1**
Number of Vessel Affiliations	**485**	**471**	**442**	**354**	**337**	**311**	**287**	**248**	**240**

[67] Each category presents the incremental difference in cumulative groundfish revenue from the previous category. For example, by adding the groundfish revenue presented for the "Top 1%" and ">1% to 20%" categories in 2007, one can obtain the total groundfish revenue earned by the top 20% of vessel affiliations ($67.7 million) in 2007, $23.1 million of which was earned by the top 1% of vessel affiliations.

Table 36. Number of vessel affiliations with revenue from all species (all trips) by cumulative quartiles (ordered high to low) and fishing year.

Percent of All Species Revenue	2007	2008	2009	2010	2011	2012	2013	2014	2015
Top 25%	13 1.6%	14 1.9%	15 2.0%	12 1.7%	12 1.9%	12 2.0%	11 1.8%	11 1.8%	10 1.8%
Top 50%	71 9.0%	68 9.0%	72 9.7%	55 7.9%	54 8.5%	53 8.6%	50 8.3%	52 8.7%	48 8.6%
Top 75%	190 24.1%	185 24.5%	195 26.4%	155 22.2%	141 22.2%	134 21.8%	130 21.5%	136 22.8%	123 22.1%
100%	789 100.0%	755 100.0%	740 100.0%	698 100.0%	636 100.0%	615 100.0%	604 100.0%	597 100.0%	557 100.0%

Table 37. Number of vessel affiliations with revenue from groundfish (all trips, ordered from highest-earners to lowest-earners) and fishing year.

Percent of Groundfish Revenue	2007	2008	2009	2010	2011	2012	2013	2014	2015
Top 50%	34 7.0%	33 7.0%	33 7.5%	16 4.5%	18 5.3%	16 5.1%	12 4.2%	10 4.0%	9 3.8%
Top 75%	99 20.4%	87 18.5%	88 19.9%	44 12.4%	43 12.8%	36 11.6%	29 10.1%	24 9.7%	23 9.6%
100%	485 100.0%	471 100.0%	442 100.0%	354 100.0%	337 100.0%	311 100.0%	287 100.0%	248 100.0%	240 100.0%

Table 38. Gini values at the affiliated vessel level for all species revenues and groundfish revenues (from active vessels) by fishing year.

Fishing Year	All Species Gini Coefficient	Groundfish Gini Coefficient
2007	0.678	0.734
2008	0.671	0.752
2009	0.655	0.745
2010	0.694	0.815
2011	0.690	0.810
2012	0.692	0.821
2013	0.703	0.847
2014	0.687	0.848
2015	0.692	0.843

Table 39. Changes in employment indicators by vessel size category and fishing year.

Vessels Less than 30'	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total CREW POSITIONS	105	91	106	89	77	73	71	70	56
Total CREW-TRIPS	2881	2,784	3,103	2,531	2,462	2,108	2,117	2,262	2,464
Total CREW-DAYS	951	904	1,055	840	812	682	726	805	824
Crew-days/Crew-trips	0.33	0.32	0.34	0.33	0.33	0.32	0.34	0.36	0.33
Vessels 30' to < 50'	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total CREW POSITIONS	1,144	1,059	1,017	969	884	869	828	797	746
Total CREW-TRIPS	89,238	85,156	88,260	69,547	69,207	66,655	59,281	59,048	54,447
Total CREW-DAYS	43,382	40,431	39,920	33,445	35,173	34,384	32,170	31,642	28,305
Crew-days/Crew-trips	0.49	0.47	0.45	0.48	0.51	0.52	0.54	0.54	0.52
Vessels 50' to < 75'	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total CREW POSITIONS	850	795	742	676	672	664	626	629	607
Total CREW-TRIPS	47,957	45,383	43,513	38,079	37,219	35,364	32,891	28,966	30,763
Total CREW-DAYS	78,968	75,742	75,543	65,498	65,231	66,012	63,048	59,727	62,341
Crew-days/Crew-trips	1.65	1.67	1.74	1.72	1.75	1.87	1.92	2.06	2.03
Vessels 75' and Above	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total CREW POSITIONS	597	586	568	529	537	532	507	503	504
Total CREW-TRIPS	16,356	16,789	15,644	14,279	13,647	13,435	12,624	12,585	12,764
Total CREW-DAYS	77,361	74,980	72,545	70,752	68,640	68,019	62,176	59,305	62,080
Crew-days/Crew-trips	4.73	4.47	4.64	4.95	5.03	5.06	4.93	4.71	4.86
All Vessel Sizes	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total CREW POSITIONS	2,696	2,531	2,433	2,263	2,170	2,138	2,032	1,999	1,913
Total CREW-TRIPS	156,432	150,112	150,520	124,436	122,535	117,562	106,913	102,861	100,438
Total CREW-DAYS	200,662	192,057	189,063	170,535	169,856	169,097	158,120	151,479	153,550
Crew-days/Crew-trips	1.28	1.28	1.26	1.37	1.39	1.44	1.48	1.47	1.53

Table 40. Changes in employment indicators by home port state and fishing year.

CT	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total CREW POSITIONS	47	35	41	38	42	39	39	46	50
Total CREW-TRIPS	2,368	2,089	1,912	2,028	1,463	1,541	1,280	1,636	2,150
Total CREW-DAYS	4,089	3,907	3,707	4,018	3,004	4,478	3,576	2,946	3,401
Crew-days/Crew-trips	1.73	1.87	1.94	1.98	2.05	2.91	2.79	1.80	1.58
MA	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total CREW POSITIONS	1,411	1,295	1,239	1,133	1,069	1,050	984	979	948
Total CREW-TRIPS	73,413	69,183	70,891	53,518	54,176	51,775	44,409	43,097	43,776
Total CREW-DAYS	98,078	93,610	95,750	82,487	84,370	81,637	73,643	73,782	75,919
Crew-days/Crew-trips	1.34	1.35	1.35	1.54	1.56	1.58	1.66	1.71	1.73
ME	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total CREW POSITIONS	316	269	268	251	228	243	223	220	187
Total CREW-TRIPS	18,267	18,012	19,124	16,541	14,003	14,682	13,185	13,828	12,402
Total CREW-DAYS	19,175	15,738	15,971	15,559	14,854	16,548	15,278	14,309	12,180
Crew-days/Crew-trips	1.05	0.87	0.84	0.94	1.06	1.13	1.16	1.03	0.98
NH	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total CREW POSITIONS	124	120	115	107	105	96	87	77	57
Total CREW-TRIPS	9,896	10,175	10,971	8,033	8,496	8,072	5,932	5,845	4,242
Total CREW-DAYS	5,658	6,197	6,324	3,889	4,941	5,166	4,512	4,070	3,270
Crew-days/Crew-trips	0.57	0.61	0.58	0.48	0.58	0.64	0.76	0.70	0.77

Table 40 (continued). Changes in employment indicators by home port state and fishing year.

NJ	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total CREW POSITIONS	170	179	162	149	145	149	153	149	157
Total CREW-TRIPS	12,988	12,577	11,332	9,972	9,575	8,133	7,703	7,260	7,824
Total CREW-DAYS	12,195	11,939	10,856	10,078	9,904	10,323	9,664	9,334	10,241
Crew-days/Crew-trips	0.94	0.95	0.96	1.01	1.03	1.27	1.25	1.29	1.31
NY	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total CREW POSITIONS	214	223	219	209	217	209	194	192	173
Total CREW-TRIPS	14,865	14,934	15,330	14,720	14,941	14,203	13,170	13,005	11,796
Total CREW-DAYS	16,515	16,433	16,982	15,812	16,049	15,103	14,627	14,365	13,599
Crew-days/Crew-trips	1.11	1.10	1.11	1.07	1.07	1.06	1.11	1.10	1.15
RI	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total CREW POSITIONS	301	283	267	253	248	232	224	225	222
Total CREW-TRIPS	20,124	17,845	16,245	15,246	15,535	15,024	16,994	14,212	14,079
Total CREW-DAYS	32,424	29,861	26,817	26,803	25,137	24,257	25,629	23,107	23,577
Crew-days/Crew-trips	1.61	1.67	1.65	1.76	1.62	1.61	1.51	1.63	1.67
Other Northeast	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total CREW POSITIONS	148	137	129	130	128	128	134	131	138
Total CREW-TRIPS	4,067	5,294	4,715	4,378	4,346	4,132	4,240	3,976	4,159
Total CREW-DAYS	11,830	14,371	12,655	11,888	11,597	11,585	11,191	9,567	11,332
Crew-days/Crew-trips	2.91	2.71	2.68	2.72	2.67	2.80	2.64	2.41	2.72
Total*	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total CREW POSITIONS	2,731	2,540	2,440	2,270	2,183	2,146	2,038	2,019	1,932
Total CREW-TRIPS	155,988	150,109	150,520	124,436	122,535	117,562	106,913	102,859	100,428
Total CREW-DAYS	199,964	192,055	189,062	170,534	169,855	169,097	158,120	151,479	153,519
Crew-days/Crew-trips	1.28	1.28	1.26	1.37	1.39	1.44	1.48	1.47	1.53

*Vessels may change home ports during the year resulting in associated crew positions for more than one state. This means the total positions shown here are higher than the total positions as calculated at the permit level or by vessel size category. The total work opportunity associated with these positions, crew trips, and crew-days totals, is the same as reported at the permit level.

Table 41: Per day trip cost averages (in 2010 dollars) by fishing year.

Trip Type	2007	2008	2010	2011	2012	2013	2014	2015
Gillnet <40' day trip	$478	$555	$528	$631	$556	$587	$582	$414
Gillnet <40' multiday trip	$663	$569	$416	$500	$438	$348	$469	$301
Gillnet ≥40' day trip	$637	$576	$625	$680	$615	$563	$580	$401
Gillnet ≥40' multiday trip	$790	$526	$621	$680	$641	$552	$523	$435
Longline <40' day trip	$1,135	$1,291	$761	$516	$737	$739	$335	$207
Longline <40' multiday trip	$1,390	$1,390	$1,390	$1,390	$1,390	$1,390	$1,390	$1,390
Longline ≥40' day trip	$1,100	$1,071	$1,208	$1,173	$881	$627	$737	$461
Longline ≥40' multiday trip	$1,410	$1,460	$1,257	$1,410	$1,379	$1,379	$981	$667
Scallop dredge <50'	$631	$709	$606	$702	$701	$663	$615	$462
Scallop dredge 50' to 75'	$1,347	$1,282	$1,383	$1,618	$1,664	$1,513	$1,313	$987
Scallop dredge ≥75'	$2,019	$1,896	$1,935	$2,386	$2,503	$2,639	$2,334	$1,660
Trawl <50' day trip	$717	$842	$706	$812	$792	$791	$713	$541
Trawl <50' multiday trip	$646	$874	$806	$885	$767	$833	$718	$526
Trawl 50' to 75' day trip	$1,045	$999	$854	$1,044	$970	$1,033	$854	$659
Trawl 50' to 75' multiday trip	$1,660	$1,629	$1,391	$1,586	$1,511	$1,466	$1,249	$867
Trawl ≥75' day trip	$1,419	$1,351	$1,664	$1,917	$1,797	$1,650	$1,372	$870
Trawl ≥75' multiday trip	$2,110	$1,981	$2,030	$2,346	$2,389	$2,155	$1,948	$1,376
Pots and traps	$974	$974	$974	$974	$974	$974	$974	$974
Purse seine	$1,916	$3,133	$1,385	$1,834	$1,656	$1,479	$1,532	$1,073
Hand gear	$653	$653	$653	$653	$653	$653	$653	$653
Other gear <50'	$605	$1,179	$430	$545	$933	$814	$683	$771
Other gear 50' to 75'	$1,028	$1,028	$1,028	$1,028	$1,028	$1,028	$1,028	$1,028
Other gear ≥75'	$3,804	$4,569	$4,055	$4,705	$4,770	$4,049	$3,462	$2,324

Table 42: Per day values for groundfish trips (in 2010 dollars) by fishing year.

Vessels Less than 30'	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Median revenue per day	$866	$649	$714	$488	$755	$927	$383	$296	$620
Median trip cost per day	$666	$669	$669	$662	$664	$661	$660	$657	$654
Median owner share per day	$79	$0	$8	$0	$72	$206	$0	$0	$24
Median crew share per man per day	$0	$2	$0	$0	$53	$153	$0	$0	$184
Vessels 30' to < 50'	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Median revenue per day	$3,173	$2,844	$2,673	$3,705	$3,693	$3,126	$3,064	$3,657	$3,202
Median trip cost per day	$745	$714	$619	$765	$870	$846	$796	$819	$660
Median owner share per day	$1,776	$1,537	$1,515	$2,063	$2,000	$1,615	$1,630	$2,013	$1,753
Median crew share per man per day	$552	$491	$483	$581	$561	$455	$402	$469	$414
Vessels 50' to < 75'	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Median revenue per day	$3,593	$3,325	$3,266	$4,652	$4,836	$3,895	$3,939	$4,231	$4,171
Median trip cost per day	$1,166	$1,156	$960	$1,391	$1,461	$1,305	$1,364	$1,307	$948
Median owner share per day	$1,580	$1,419	$1,506	$2,112	$2,164	$1,676	$1,714	$1,913	$2,009
Median crew share per man per day	$494	$436	$472	$651	$665	$525	$522	$569	$610
Vessels 75' and Above	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Median revenue per day	$5,083	$4,651	$4,474	$5,626	$5,807	$4,784	$4,850	$5,011	$5,167
Median trip cost per day	$2,205	$2,089	$1,827	$2,280	$2,584	$2,574	$2,384	$2,171	$1,549
Median owner share per day	$2,010	$1,805	$1,800	$2,238	$2,281	$1,761	$1,818	$1,961	$2,184
Median crew share per man per day	$239	$203	$227	$271	$242	$124	$154	$213	$332

Table 43: Per day values for non-groundfish trips (in 2010 dollars) by fishing year.

Vessels Less than 30'	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Median revenue per day	$445	$433	$408	$499	$503	$556	$588	$641	$624
Median trip cost per day	$663	$663	$664	$663	$661	$664	$668	$664	$665
Median owner share per day	$0	$0	$0	$0	$0	$0	$0	$0	$0
Median crew share per man per day	$0	$0	$0	$0	$0	$0	$0	$0	$5
Vessels 30' to < 50'	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Median revenue per day	$1,863	$1,717	$1,652	$2,014	$2,057	$2,054	$2,088	$2,317	$2,557
Median trip cost per day	$981	$992	$981	$983	$986	$991	$990	$987	$987
Median owner share per day	$745	$545	$579	$853	$837	$813	$844	$1,079	$1,264
Median crew share per man per day	$316	$237	$265	$366	$355	$328	$352	$414	$478
Vessels 50' to < 75'	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Median revenue per day	$3,092	$3,396	$3,004	$3,339	$4,154	$4,143	$3,504	$3,809	$3,975
Median trip cost per day	$1,357	$1,292	$1,097	$1,090	$1,307	$1,363	$1,389	$1,273	$991
Median owner share per day	$1,272	$1,454	$1,305	$1,499	$1,823	$1,859	$1,498	$1,700	$1,909
Median crew share per man per day	$409	$476	$426	$496	$591	$587	$485	$546	$591
Vessels 75' and Above	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Median revenue per day	$4,591	$4,544	$4,077	$5,405	$7,012	$6,716	$6,345	$6,908	$6,965
Median trip cost per day	$2,190	$2,065	$1,779	$2,130	$2,508	$2,591	$2,471	$2,320	$1,680
Median owner share per day	$1,745	$1,755	$1,576	$2,126	$2,779	$2,620	$2,501	$2,843	$3,062
Median crew share per man per day	$146	$196	$176	$234	$347	$284	$277	$379	$512

Table 44: Median owner and crew share per vessel (in thousands of 2010 dollars), by fishing year.

Vessel Size Category	Share Type	2007	2008	2009	2010	2011	2012	2013	2014	2015
Less than 30’	Owner share	$0.8	$0.7	$0.5	$0.6	$1.6	$1.8	$0.7	$1.5	$1.3
Less than 30’	Crew share	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.0	$0.0	$0.0
30’ to <50’	Owner share	$55.5	$50.0	$58.7	$57.6	$61.7	$52.9	$45.5	$60.5	$63.0
30’ to <50’	Crew share	$18.0	$17.5	$20.2	$21.0	$22.5	$19.5	$15.4	$19.8	$19.9
50’ to <75’	Owner share	$137.1	$135.5	$144.0	$172.1	$182.6	$171.1	$192.9	$172.4	$220.3
50’ to <75’	Crew share	$102.6	$109.8	$120.3	$126.6	$144.4	$145.2	$166.2	$143.9	$176.3
75’ and Above	Owner share	$298.3	$310.9	$269.6	$380.4	$450.4	$423.1	$419.0	$374.4	$461.7
75’ and Above	Crew share	$163.4	$148.8	$136.0	$233.1	$257.0	$200.5	$203.6	$242.3	$378.3

Table 45: Aggregate owner and crew shares by vessel size category (in millions of 2010 dollars), by fishing year.

Vessel Size Category	Share Type	2007	2008	2009	2010	2011	2012	2013	2014	2015
Less than 30’	Owner share	$0.3	$0.3	$0.3	$0.4	$0.3	$0.2	$0.3	$0.3	$0.4
Less than 30’	Crew share	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1
30’ to <50’	Owner share	$41.8	$38.7	$37.5	$36.4	$36.0	$30.3	$27.4	$32.1	$29.1
30’ to <50’	Crew share	$15.8	$14.8	$14.2	$14.1	$14.1	$11.9	$10.6	$12.3	$11.0
50’ to <75’	Owner share	$47.8	$45.4	$43.5	$48.0	$53.1	$46.9	$42.7	$41.4	$47.1
50’ to <75’	Crew share	$41.9	$39.9	$38.2	$41.9	$47.2	$42.4	$39.2	$36.9	$42.2
75’ and above	Owner share	$47.2	$46.8	$42.5	$51.7	$58.7	$54.3	$48.4	$45.0	$51.8
75’ and above	Crew share	$30.3	$30.1	$29.0	$35.5	$40.2	$36.2	$32.1	$30.2	$39.9
Grand Total	**Owner share**	**$137.0**	**$131.1**	**$123.8**	**$136.4**	**$148.1**	**$131.8**	**$118.7**	**$118.8**	**$128.4**
Grand Total	**Crew share**	**$88.0**	**$84.8**	**$81.5**	**$91.7**	**$101.5**	**$90.5**	**$82.0**	**$79.4**	**$93.2**

Table 46: Aggregate owner and crew shares by homeport state (in millions of 2010 dollars) and fishing year.

Home Port State	Share Type	2007	2008	2009	2010	2011	2012	2013	2014	2015
CT	Owner share	$1.8	$1.8	$1.6	$2.5	$2.3	$3.7	$3.1	$2.7	$3.0
CT	Crew share	$1.1	$1.0	$0.9	$1.5	$1.4	$2.6	$2.3	$2.0	$2.3
MA	Owner share	$70.3	$63.8	$65.9	$69.7	$75.8	$65.3	$57.3	$58.2	$62.7
MA	Crew share	$45.8	$41.9	$44.1	$47.3	$51.9	$44.8	$38.9	$37.6	$45.0
ME	Owner share	$13.8	$12.8	$13.4	$15.0	$13.3	$12.6	$12.3	$13.3	$12.2
ME	Crew share	$8.0	$7.2	$7.8	$9.0	$8.2	$7.6	$7.4	$7.7	$7.2
NH	Owner share	$4.5	$5.5	$4.9	$3.9	$4.3	$3.7	$2.6	$2.3	$2.2
NH	Crew share	$1.8	$2.2	$2.0	$1.6	$1.9	$1.5	$1.0	$1.0	$0.9
NJ	Owner share	$10.5	$9.6	$8.2	$10.1	$11.0	$10.3	$9.8	$9.4	$11.6
NJ	Crew share	$6.4	$6.1	$5.4	$6.6	$7.9	$7.3	$7.3	$6.8	$9.0
NY	Owner share	$10.0	$11.0	$10.3	$12.5	$14.5	$12.5	$10.7	$11.4	$11.2
NY	Crew share	$6.0	$6.9	$6.3	$8.0	$9.3	$7.8	$7.0	$7.4	$7.5
RI	Owner share	$17.2	$16.7	$13.0	$15.2	$18.1	$15.3	$15.6	$14.6	$15.9
RI	Crew share	$11.7	$11.6	$9.5	$11.5	$13.6	$11.9	$12.1	$11.3	$12.7
All Other States	Owner share	$9.1	$9.8	$6.5	$7.6	$8.8	$8.5	$7.4	$6.9	$9.7
All Other States	Crew share	$7.4	$7.9	$5.4	$6.3	$7.4	$7.0	$6.0	$5.7	$8.4
Grand Total	**Owner share**	**$137.0**	**$131.1**	**$123.8**	**$136.4**	**$148.1**	**$131.8**	**$118.7**	**$118.8**	**$128.4**
Grand Total	**Crew share**	**$88.0**	**$84.8**	**$81.5**	**$91.7**	**$101.5**	**$90.5**	**$82.0**	**$79.4**	**$93.2**

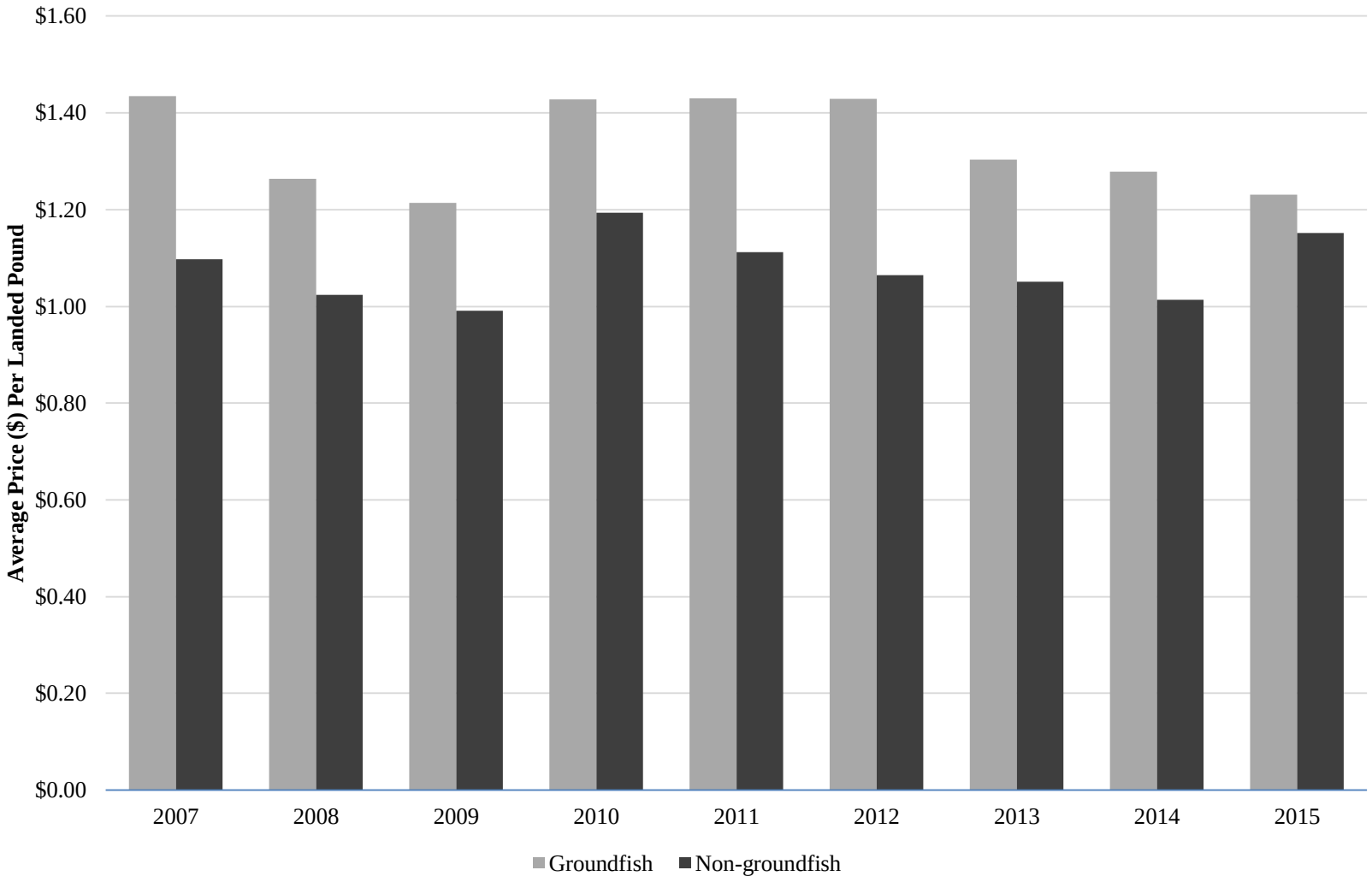


Figure 1. Yearly average price (in 2010 dollars per landed pound) of combined groundfish vs. other species.

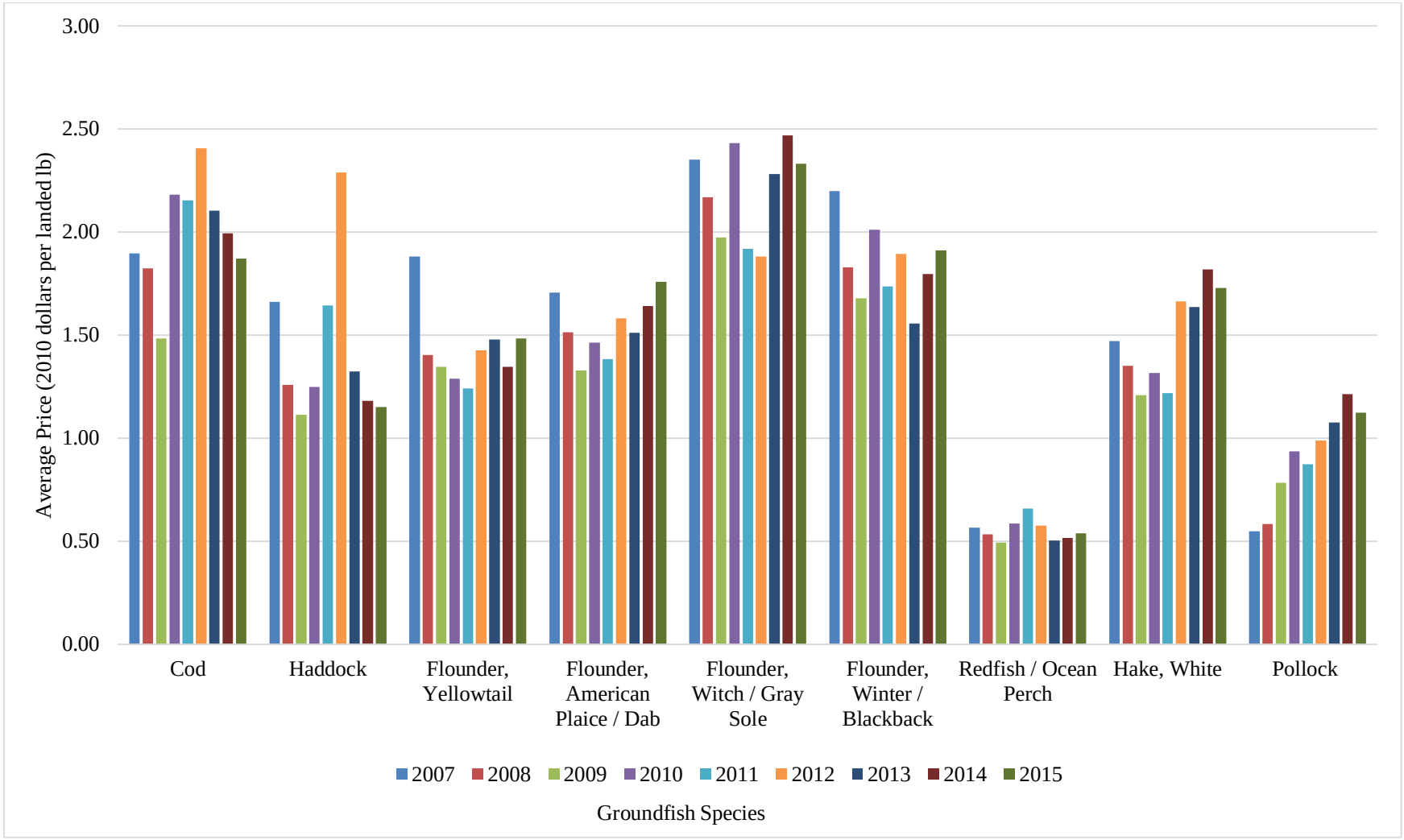


Figure 2. Yearly average price (in 2010 dollars per landed pound) by allocated groundfish species.

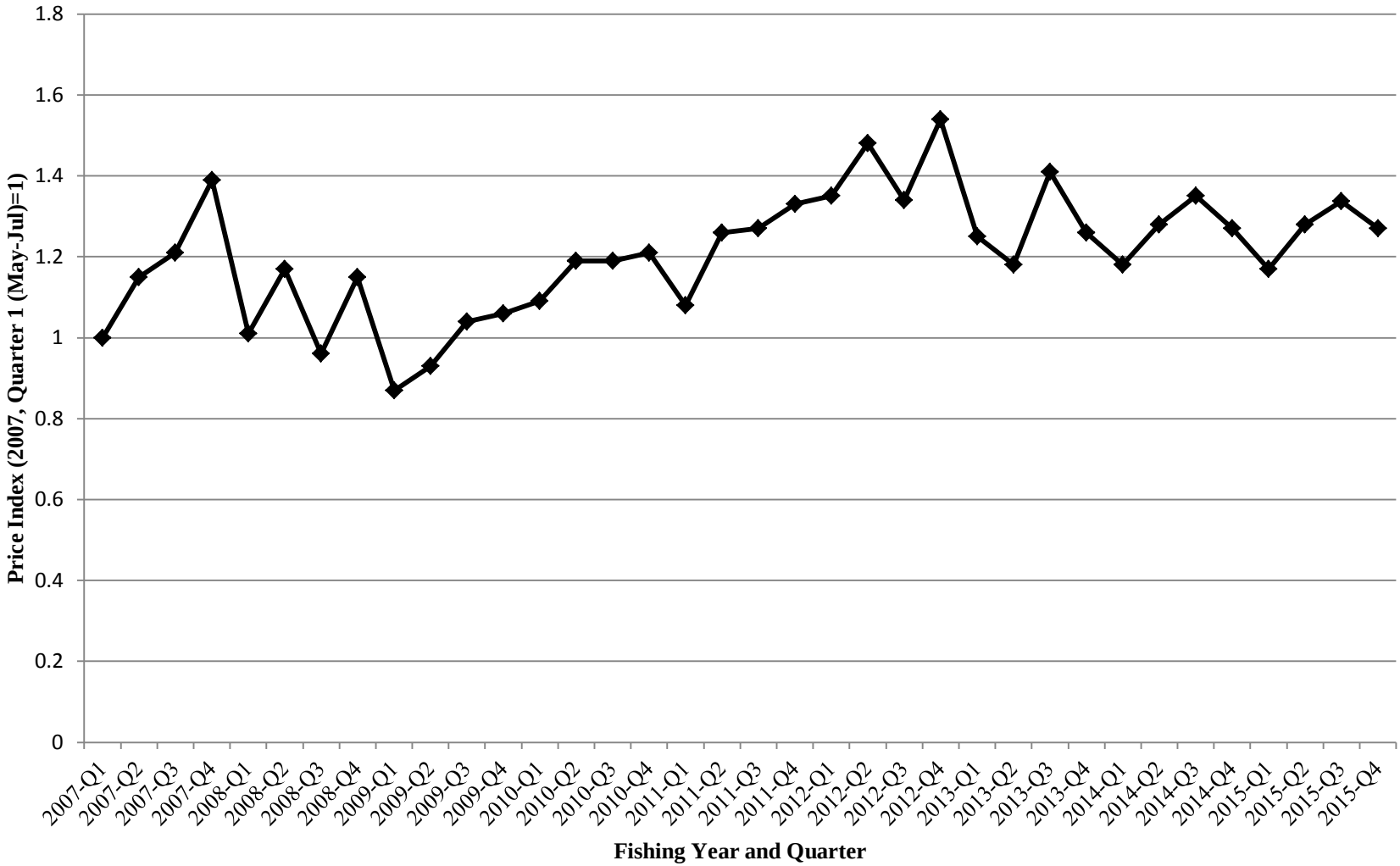
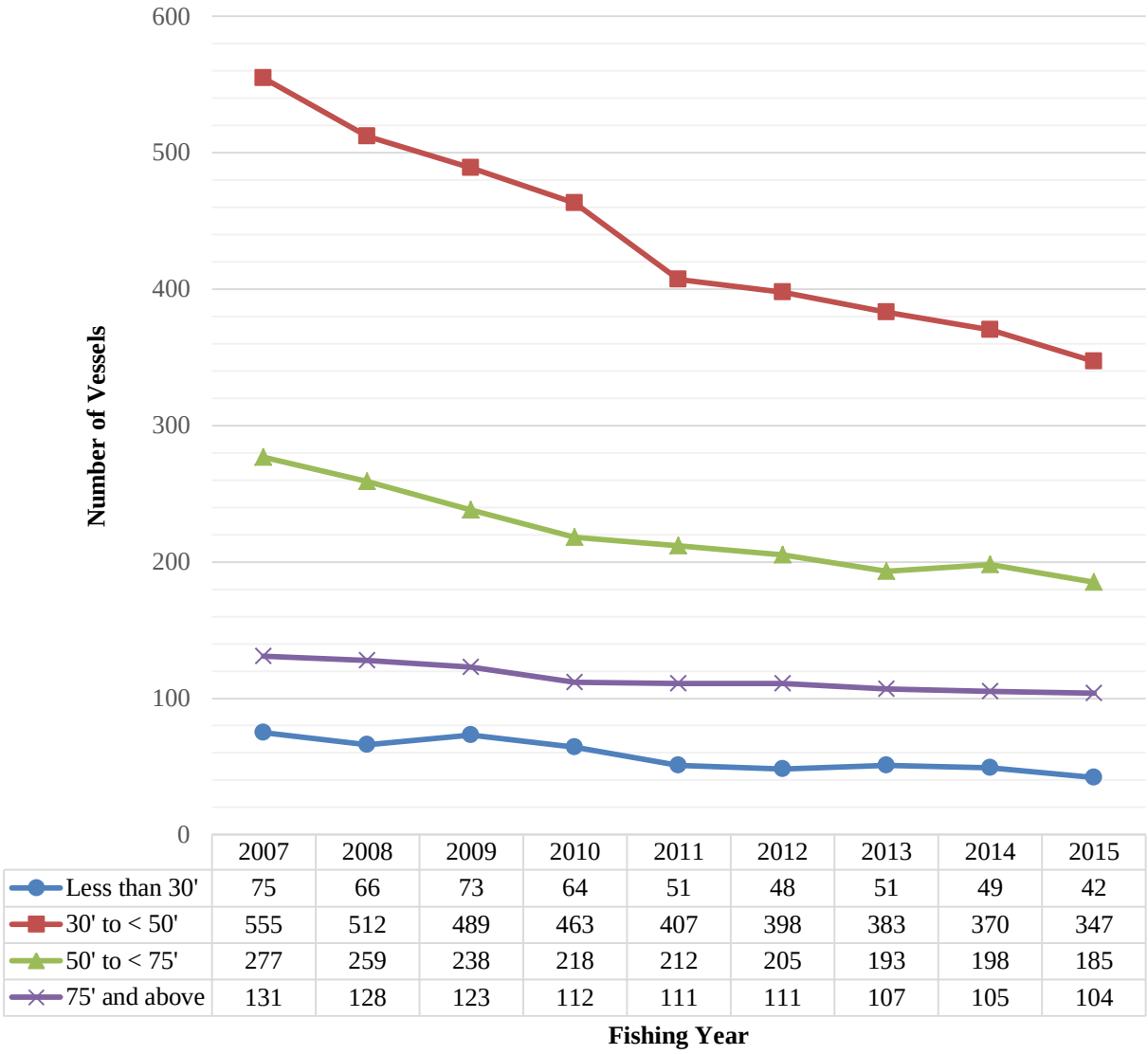
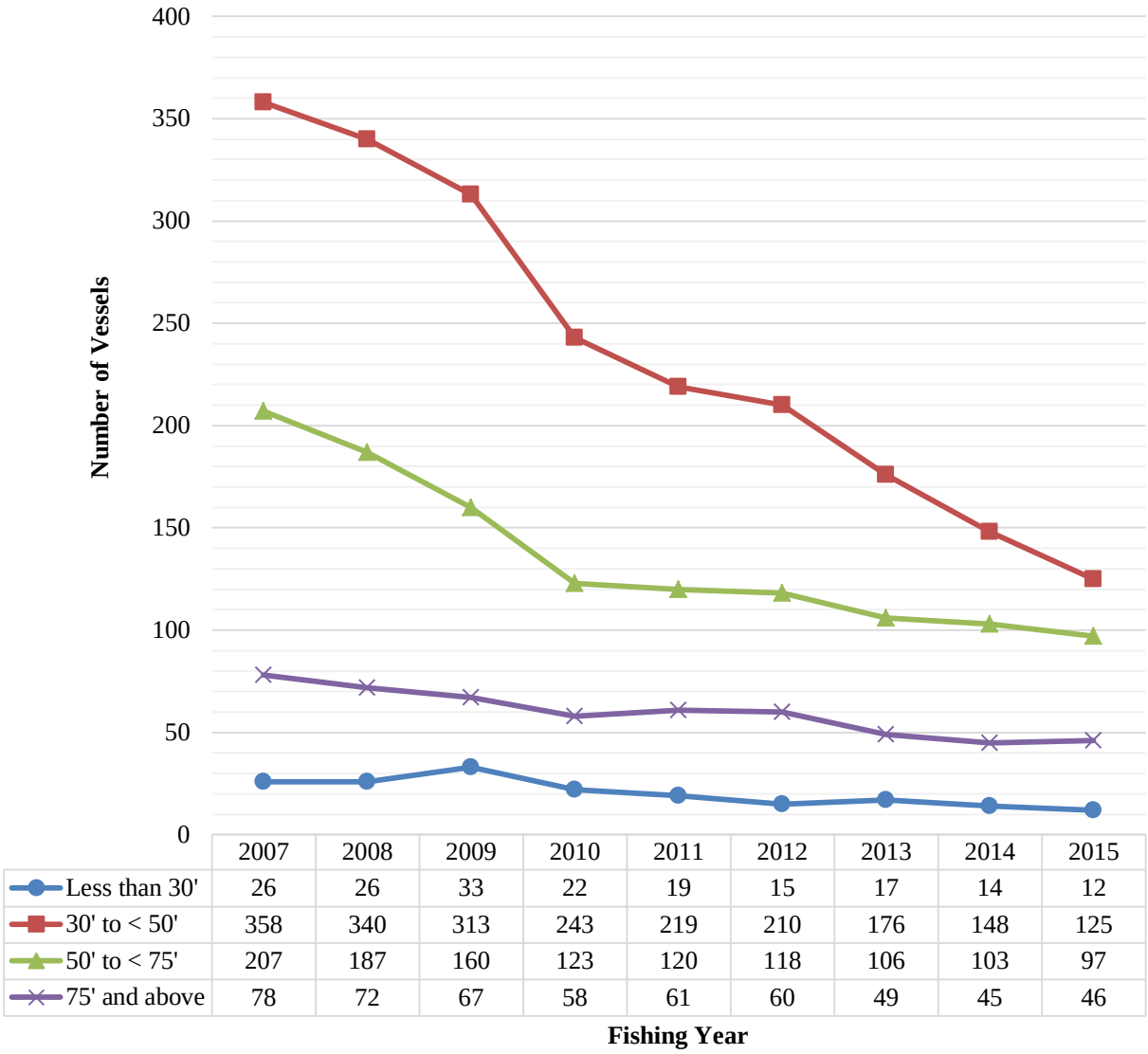


Figure 3. Quantity adjusted groundfish price index (base period = May through July 2007)



	2007	2008	2009	2010	2011	2012	2013	2014	2015
Less than 30'	75	66	73	64	51	48	51	49	42
30' to < 50'	555	512	489	463	407	398	383	370	347
50' to < 75'	277	259	238	218	212	205	193	198	185
75' and above	131	128	123	112	111	111	107	105	104

Figure 4. Number of vessels with revenue from any species by vessel size category.



	2007	2008	2009	2010	2011	2012	2013	2014	2015
Less than 30'	26	26	33	22	19	15	17	14	12
30' to < 50'	358	340	313	243	219	210	176	148	125
50' to < 75'	207	187	160	123	120	118	106	103	97
75' and above	78	72	67	58	61	60	49	45	46

Figure 5. Number of vessels with revenue from at least one groundfish trip by vessel size category.

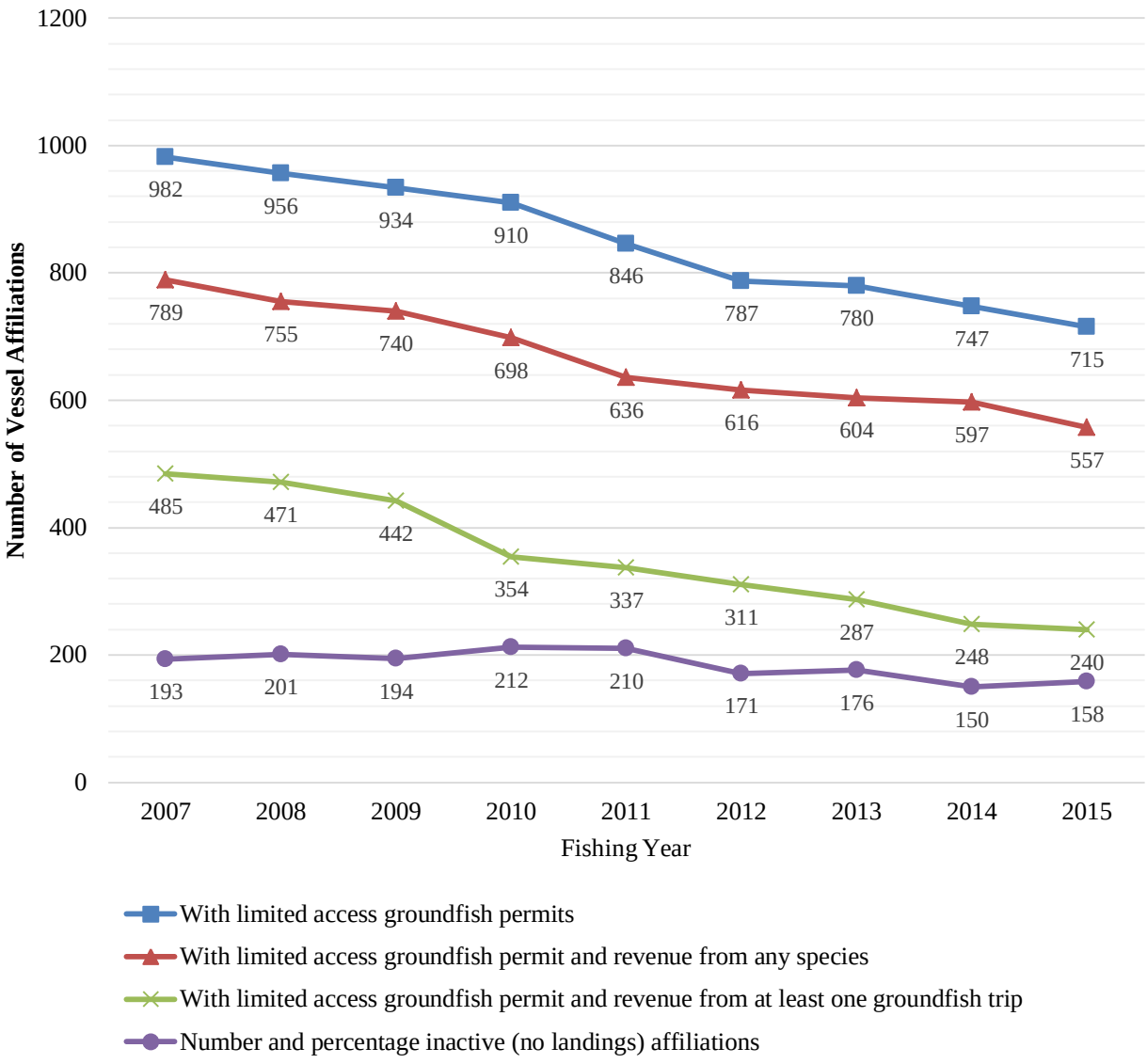


Figure 6. Number of vessel affiliations by fishing year.

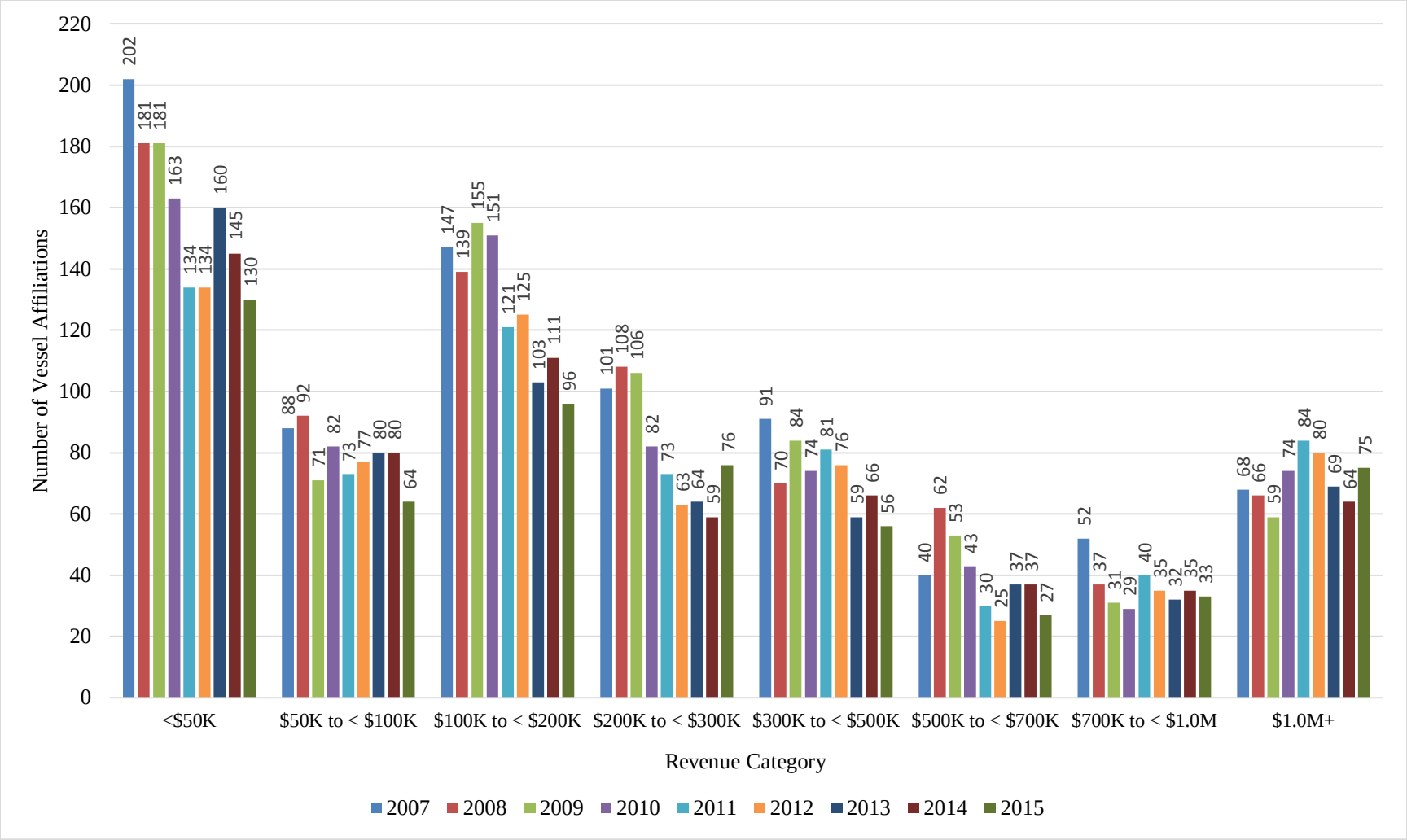


Figure 7. Number of vessel affiliations with revenue from any species by total revenue category.

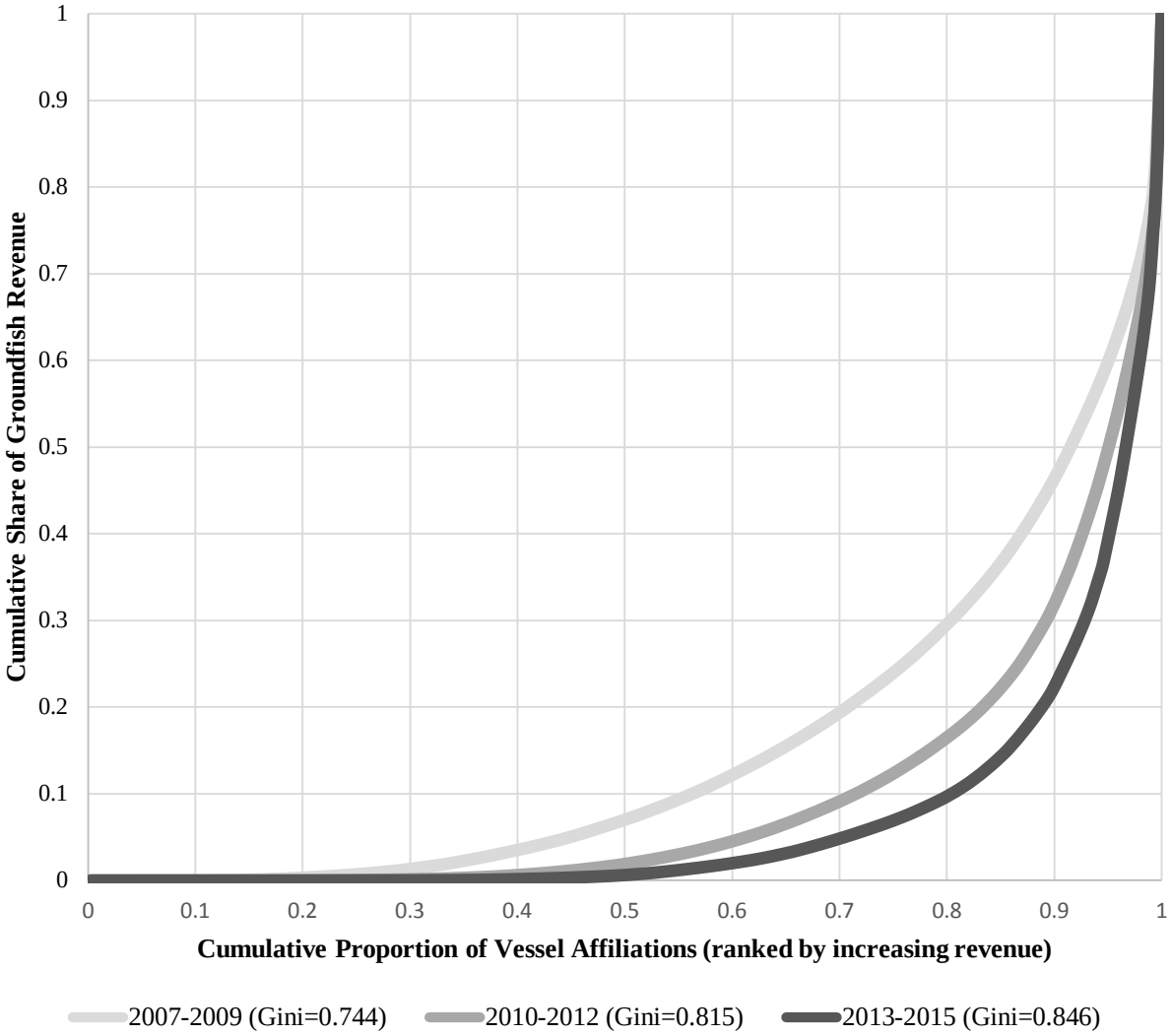


Figure 8. Lorenz curves and Gini values at the affiliated (active) vessel level for groundfish revenues.

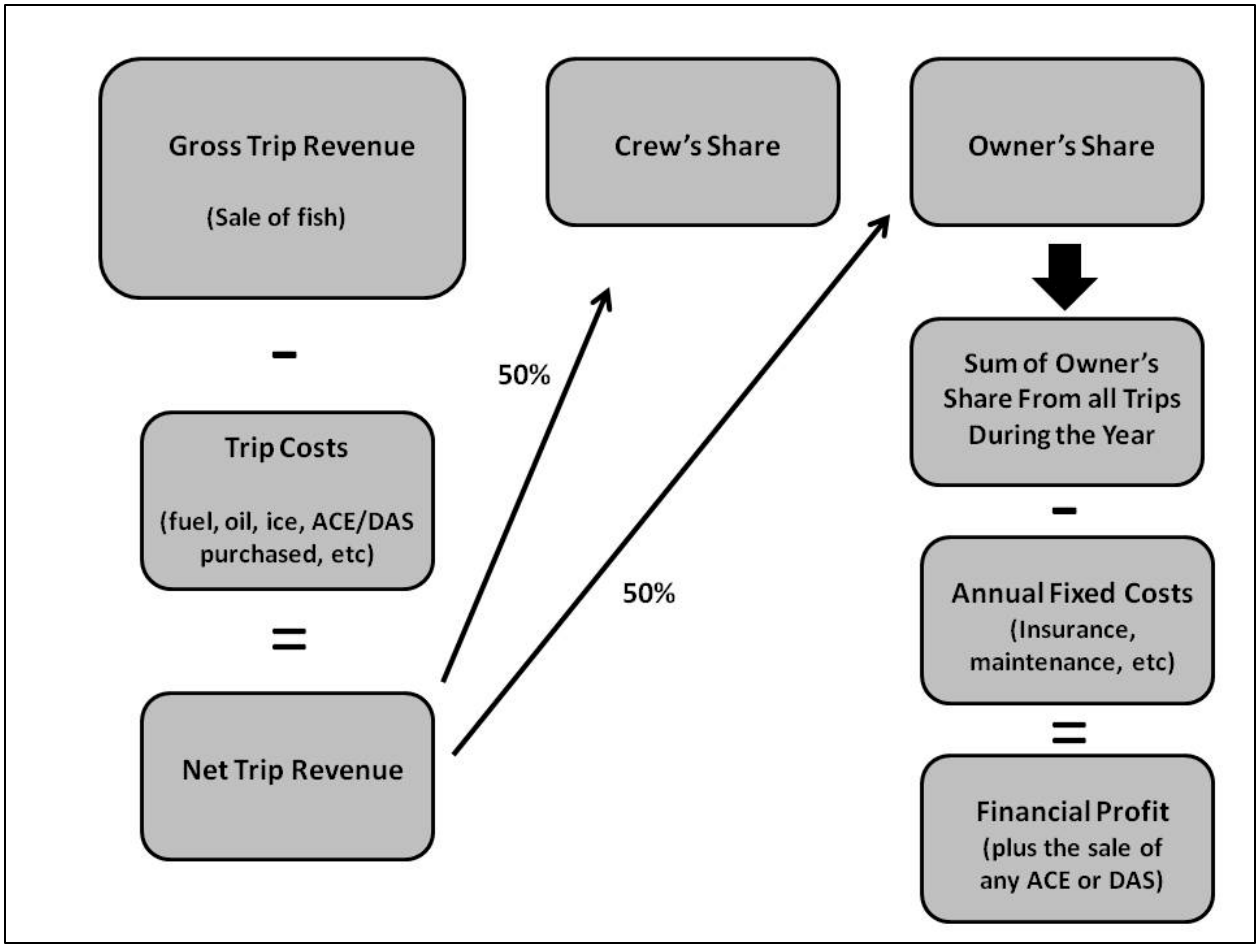


Figure 9. Components of annual financial profit (illustrative example).

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