

changes in the ratio are informative. For example, a declining trend in the ratio would imply a reduction in time spent per “earning opportunity” (a crew trip).

Total crew days for all vessel sizes combined decreased 6.8% from 2012 to 2013 for all vessels. Since total crew trips declined during the same time period at a higher rate (8.9%), the ratio of crew days to crew trips has increased. This suggests that the time spent per earning opportunity has increased, while at the same time earning opportunities have decreased. Total crew days were at four-year lows in 2013 for all vessel size categories, with the exception of the <30' vessel size category, which saw a 1.8% rise (+13.0 crew days) from 2012 to 2013 (Table 40).

Most home port states saw declines in 2013 in their total numbers of crew days. Massachusetts, New Jersey, and New York hit four-year lows in their numbers of crew days in 2013, with declines over 2010-2013 varying from 5.2% for New Jersey to 11.7% for Massachusetts. Massachusetts also saw the largest decline in absolute terms (-9,717 crew days from 2010 to 2013). In Connecticut, Maine, and New Hampshire, crew days declined in 2013 from 2012, but they were not as low as they had been for other years in the time series. Decreases in these states from 2012 to 2013 ranged from 7.8% for Maine to 20.7% for Connecticut, with Maine seeing the largest fall in crew days among these states in absolute terms (-1,287 crew days). In Rhode Island, the number of crew days was higher in 2013 than it was in 2011, but it did not reach a four-year high. Rhode Island saw a 5.8% increase in crew days from 2012 to 2013, but crew days have declined overall (-4.4%) for Rhode Island during the four years. In the remaining Northeast region home port states, the combined number of crew days was at a four-year low in 2013, decreasing 3.5% from 2012 and 5.0% overall from 2010-2013 (Table 41).

The ratio of crew days to crew trips, indicating time spent per earning opportunity for crew, was a four-year high in 2013 for the groundfish fleet as a whole, increasing 2.8% from 2012 and 8.0% from 2010. The home port states of Massachusetts, Maine, New Hampshire, and New York all saw four-year highs in their ratios in 2013. In Connecticut and New Jersey, the ratio fell in 2013 from 2012 but increased overall in the four-year time span by 35.6% and 23.8%, respectively. The home port state of Rhode Island and the remaining Northeast region home port states combined both saw four-year lows for their ratios of crew days to crew trips in 2013, with their ratios falling 14.7% and 4.0% over 2010-2013, respectively (Table 41).

Changes in crew-based employment indicators do not indicate, by themselves, whether crew incomes have changed. Crew income is influenced by many factors such as a vessel's revenue/cost sharing formula (including whether or not the costs of leasing quota are passed onto crew), the amount of revenue a vessel receives from fish sales, the costs of fishing, the number of vessels actively fishing, and the intensity of fishing. In the following section, measures of crew share of net revenues will be discussed.

8. NET REVENUES

Net revenues were estimated using trip costs³⁶ 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

³⁶ Trip costs are typically those that vary with the amount of fishing effort, such as fuel, bait, or fishing hooks.

groundfish 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.³⁷ While analysis of the owner's share of net revenue is just one component of annual financial profit, it is indicative of economic performance (at least in the short run). See Figure 12 for a graphical depiction of the components of annual financial profit and the relationship between owner's share and profit.

Trip costs used in these analyses include fuel, oil, ice, supplies, bait, food, water, damage, lumper fees,³⁸ and sector membership fees. There may be additional trip costs (e.g., communications costs or trucking fees) that must be covered. One important cost that has not been included in the estimation of net revenue is the cost incurred by sector vessels to purchase additional groundfish ACE in the period from 2010 to 2013 or to purchase DAS for common pool vessels.

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 92 vessel types, based on gear used, vessel length, trip duration (single vs. multi-day trips), and fishing year (Table 42). 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 revenue received for the trip (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 2013 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 2011 fixed cost survey were used to determine common lay systems according to vessel size and number of crew.³⁹ Information is not available to determine whether a vessel was operated by the owner or a hired captain. 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

³⁷ Fixed costs are typically costs that do not vary with the amount of fishing effort, such as insurance.

³⁸ 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.

³⁹ 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.

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.

Net revenue data presented are not adjusted for leasing activity, i.e. leasing revenues earned by vessel owners that lease out quota or leasing costs incurred by vessel owners (and, in some cases, passed along to crew) to lease in quota to fish. Fishery-wide impacts of quota trading on net revenues are neutral overall because aggregate quota costs equal aggregate quota revenues. However, quota trading has distributional effects, as the impact of quota trades on net revenues will vary from sector member to sector member, based on characteristics such as the number of vessels enrolled in the sector, the average length of those vessels, and whether the sector member has permits enrolled in CPH. Net sellers of quota include both sector members that fish and those that do not fish for allocated groundfish. 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.

8.1. Average Owner and Crew Shares Per Day

Average vessel owner and crew shares⁴⁰ of net revenue per day, by trip type (groundfish vs. non-groundfish) and vessel size category, are reported in Table 43 and Table 44. In 2013, average owners' shares per day on groundfish trips were the lowest in the time series. The decline was particularly sharp in the less than 30' size category where average owner share per day declined by 88.6% from \$1,372 in 2012 to \$156 in 2013. By comparison, vessels in the largest size category ($\geq 75'$) had a decline of 3.9% from 2012 to 2013. For vessels 30' to $< 50'$ in length, average owner share declined 17.9%. Vessels 50' to $< 75'$ in length saw average owner share decline 66.5% from 2012 to 2013. Average crew share per man per day on groundfish trips was at a four-year low in 2013 for all size classes with the greatest percentage decline in the less than 30' size category (91.5%) and the smallest decline (3.9%) in the largest size category ($\geq 75'$) (Table 43).

On non-groundfish trips, the average owner's shares per day were at a four-year high in 2013 for the two smallest size categories. Vessels in the less than 30' and 30' to $< 50'$ size categories saw 6.9% and 6.3% increases from 2012 to 2013 in average owner's shares per day on non-groundfish trips. For the two largest size categories, average owner's shares per day on non-groundfish trips were at a four year high in 2011. For vessels 50' to $< 75'$ in length, average owner shares per day decreased in 2013 by 7.5% from 2012 and by 9.9% from their 2011 high. Vessels in the largest size category saw average owner's share per day on non-groundfish trips fall 23.2% in 2013 from their 2011 high. However, average owner's share per day for these vessels did increase modestly in 2013 from 2012, by 3.7% (Table 44).

To help explain some of the factors behind net revenue changes, both average revenue per day and average trip costs per day are also provided in Table 43 and Table 44. Since average trip costs per day on both groundfish and non-groundfish trips remained stable for all size categories over the time series, the changes in net revenue are mostly explained by changes in revenue per day. In 2013, average revenue per day on groundfish trips were the lowest in the

⁴⁰ The average 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 average crew's share of net revenue per day per crew member.

time series for all size categories. The largest percentage declines were for vessels less than 30' (75%) and for vessels 50' to >75' (49.6%; Table 43). For non-groundfish trips, revenue per day across all size categories was similar to 2012 levels (Table 44).

8.2. Average Owner and Crew Shares per Vessel

Average owner and crew shares of net revenues may also be expressed at the vessel level rather than per day (Table 45). For all vessel size categories, the average owner and crew shares declined from 2012 levels and were the lowest in the time series for all size categories except for vessels 50' to >75'. It should be noted that the average crew share values are independent of the number of crew; these are average amounts paid to the entire crew regardless of size. Also, crew shares are an expense for vessel owners and represent earnings for crew. It is possible that these declining crew earnings were shared by fewer crew.

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 46 and Table 47, and reflect the combined result of shifts in average vessel performance and the shifts of activity among fleet segments. Total owner shares decreased from their 2011 four-year high of \$149.4 million to \$122.2 million in 2013. Total crew shares similarly declined from their 2011 four-year high of \$88.6 million to \$71.6 million in 2013. For all size categories, total aggregate owner and crew shares were the lowest in the time series (Table 46).

Aggregate owner and crew shares in Massachusetts, the state with the most groundfish activity, declined to the lowest levels in the four-year time series. For owners in Massachusetts, aggregate share declined by \$7.6 million (11.5%) from 2012 to 2013. Over the same time period, aggregate crew share in Massachusetts fell by \$5.0 million (12.2%) (Table 47).

9. CONCLUDING REMARKS

Our analyses of fishery performance measures of the limited access Northeast Multispecies (Groundfish) Fishery showed mostly negative trends in the fishery during 2012-2013, with a continuation of many of the declines seen in our last annual economic performance report.

Landed pounds of groundfish are at their lowest point in 2010-2013 for all vessels. Non-groundfish landings are at a four-year high but grew less than 1% from their 2012 levels. Non-groundfish landings and revenues did not compensate for losses in groundfish landings and revenues. This is because non-groundfish landings have not increased significantly and because average non-groundfish price has fallen to its lowest level in the past four years. Overall, total landings have fallen by 1.6% and total gross all species revenue declined by 8.8% from 2012.

Fishermen actively groundfishing in the Northeast are a shrinking group. The total number of active groundfish vessels continues to fall, with a reduction of 120 vessels over 2010-2013, with 119 fewer vessels taking groundfish trips in 2013 than in 2010. From 2012 to 2013, the fleet decreased by 28 vessels overall, with 73 fewer vessels having revenues from at least one groundfish trip. In addition, there are 130 fewer active vessel affiliations in 2013 than there were in 2010. Opportunities for vessel crew are decreasing except for a few limited instances. Overall, there is less effort targeting groundfish in the fishery: fewer boats taking groundfish trips and