

**Structures and Strategies of New England Groundfishing Businesses in
Gloucester, Massachusetts, in 'Fishing Year' 2003**

Sarah Robinson, JD, SJD
PhD Candidate
Department of Anthropology
Harvard University

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Abstract

Structures and strategies of groundfishing businesses in Gloucester, Massachusetts, in 2003, were investigated through a set of extensive interviews with a random sample of business owners in Gloucester. A key focus of the study was whether businesses used mobility as a strategy, i.e., whether they moved vessels, people, and product (fish) around as they conducted their fishing businesses.

The study found that, in 2003, the businesses were owned by individuals or by very small groups of family members, and that businesses' vessels were, in the vast majority of cases (93%), captained by a vessel (business) owner or by a family member of a vessel owner. In addition, the study found, among other things, that in 2003, the number of vessels owned by a business (defined as the person or group of persons owning and controlling a vessel or set of vessels) ranged from one to four, and averaged two. (The report contains an extensive methodological discussion, and notes that the sample of business owners was biased toward those with businesses holding multiple vessels.)

The study also found that most but not all (88%) of the businesses caught groundfish in 2003, but only 25% caught groundfish exclusively. Regarding mobility, the study found that somewhat under half the businesses were relatively immobile; 40% fished their vessel(s) exclusively in the inshore Gulf of Maine in 2003, and 44% operated exclusively out of a single port in 2003. Somewhat more than half, however, used various forms of mobility in fishing for and selling their fish: 60% fished their vessel(s) in more than one general area of ocean; 46% fished their vessel(s) in both inshore waters and offshore waters; and 56% used multiple ports (two to four) to tie-up vessels, land fish, and/or sell fish (some businesses sell some of their fish in ports other than those in which they land it, sending or taking it by truck to these 'selling ports').

The report contains a discussion of the regulatory context (for groundfish) in which these structures and strategies were created and employed (vessel-specific days-at-sea restrictions and reductions, area closures, and others). The study notes that 2003 was the year before the adoption of 10-year stock rebuilding plans for a large number of the New England groundfish stocks and accompanying regulations, among which were further reductions in vessel-specific days-at-sea allocations and, for the first time since the introduction of days-at-sea allocations in 1994, mechanisms for transferring days-at-sea from one vessel to another and hence for consolidating days-at-sea allocations. As this study examined structures and strategies in 2003, it provides a baseline account of Gloucester groundfishing businesses' structures and strategies the year before transferability was permitted in the New England groundfishery.

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Structures and Strategies of New England Groundfishing Businesses in Gloucester, Massachusetts, in 'Fishing Year' 2003¹

Sarah Robinson, JD, SJD²

I. Introduction

The New England fishing industry is in the midst of significant changes, and no part more so than the businesses that participate in the multispecies groundfish fishery. This is the fishery for cod, haddock, flounders, and other demersal finfish, prosecuted in the Gulf of Maine, on Georges Bank, and in parts south of Georges Bank. It is the oldest and largest fishery in New England, and it is, at present, the target of intensive regulatory efforts designed to rebuild overfished stocks and to “rationalize” the fishery.

Since 1994, the greater part of the commercial groundfish fishery has been a limited access fishery regulated by days-at-sea (DAS) effort controls (and by a suite of seasonal and year-round area closures, gear restrictions, minimum fish sizes, and other “input” measures).³ DAS allocations, which are annual, vessel-specific allocations of the number of “days-at-sea” a vessel may fish for groundfish species in a given year, have been reduced four times since 1994 (in 1996, 2002, 2004, and 2006). By 2006, the maximum allocation per vessel was 27.5% of a vessel’s 1994 baseline (which

¹ This is the report of a study undertaken as part of a cooperative social science research project funded by the Northeast Consortium entitled “Mapping Mobility: The Movement of New England Multispecies Vessels and Crew in New England and Beyond from 1994-2004” (Agreement No. 04-812). The ‘Mapping Mobility’ project involved two parallel studies of New England groundfishing businesses, one based in Gloucester, Massachusetts (the study reported on here) and the other based in Portland, Maine. All ‘Mapping Mobility’ project investigators jointly developed the original design of the ‘Mapping Mobility’ project and a survey instrument (see Part II) used in both the Gloucester and the Portland studies. However, the two studies – the Gloucester study and the Portland study -- were undertaken separately, by two different teams of investigators. The Gloucester team consisted of Robinson (a social anthropologist and lawyer) and three industry members, one, an original project investigator, Christine Sherman (co-owner of a fishing vessel and employee of a fishing industry organization), and two who joined the project mid-way, Don P. King (fishing captain, vessel owner, and fishing-related shoreside business owner) and Cheryl Briscoe (employee in a fishing-related shoreside business). The Portland team consisted of Jennifer Brewer (a geographer) and Gina LeDuc (industry member and wife of a fishing captain). In addition to the personnel on the two teams, one additional investigator, James Wilson (an economist) also assisted in early project design work. The ‘Mapping Mobility’ project and the Gloucester and Portland studies emanating from it were administered by the Massachusetts Fishermen’s Partnership (contractor with the Northeast Consortium) and its executive director (David Bergeron). This Gloucester report is authored by Robinson, who extends grateful thanks to the other Gloucester team members, to all project personnel on Mapping Mobility, and an extra special thanks to Don P. King, for his insights throughout and his comments on a draft of this report.

² PhD candidate, Department of Anthropology, Harvard University; sprobins@fas.harvard.edu .

³ The groundfish management plan, known as the northeast multispecies fishery management plan, is available, along with its amendments and framework adjustments, at www.nefmc.org.

amounts to 48.38 DAS for a significant portion of the fleet). By 2006, moreover, some vessels no longer qualified for this maximum and others had lost their DAS allocations all together; these were results of the 2004 reductions, in which some vessels qualified for DAS allocations in amounts below the then-maximum and others (about 7% of the 2001 permit holders) lost their DAS allocations.⁴ The 2004 restrictions also worked another important change; they allowed, for the first time since the introduction of DAS in 1994, the transfer of DAS from one permitted vessel to another.⁵

The 2004 and 2006 reductions in DAS were made in service of stock rebuilding plans adopted for 14 stocks in the groundfish fishery determined to be “overfished” (all together there are 12 species, in 19 stocks, in the multispecies groundfish fishery).⁶ These rebuilding plans call for 12 of the 14 overfished stocks to be fully rebuilt by 2013 (and the remaining two by 2026 and 2051, respectively). A fully rebuilt fishery is one in which each stock in the fishery yields its individual maximum sustainable yield. A major “benchmark” assessment is planned in 2008 for each of the 19 stocks, and additional new regulations (to ensure rebuilding progress) are planned for 2009. In addition, there are ongoing discussions about major changes in management approaches: from the DAS effort control program to the creation of multiple self-selecting, largely self-regulating fishery sectors, each one limited by annual “hard” Total Allowable Catches (TACs) of each of the 19 groundfish stocks.

These extensive changes are having – and will have – substantial effects on fishing businesses and the people who own, run, and work in them. Multiple federal laws and regulations require that effects on businesses – as well as the communities they constitute and to which they contribute – be assessed and considered as new regulations, and changes to existing regulations, are developed and adopted.⁷ These requirements notwithstanding, there is much about the fishing industry that has not been considered in the development and modification of regulations. In part, this is due to a lack of systematic empirical study of the industry in recent years. One area neither studied nor much considered is the structures and strategies of the fishing businesses that fish for groundfish. This is a critical lack as businesses’ structures and strategies

⁴ This was because the 2004 allocations were based on use of DAS in a six year period prior to 2004 (1996-2001), and vessels unable to demonstrate DAS use (and landings) in that period lost their DAS (technically, their DAS became “C” DAS, which are DAS not usable under the groundfish management plan). See Amendment 13 to the Northeast Fishery Management Plan, Final Rule, 69 FR 22906 (Apr. 27, 2004). The 7% figure is derived from information available in Framework 42 to the Northeast Multispecies Fishery Management Plan, Final Document (Apr. 21, 2006), table 31, p. 178; table 31 indicates that there were 1589 permitted vessels in 2001 and 1484 permitted vessels (“A” DAS permitted vessels) in 2004.

⁵ See Amendment 13 Final Rule, 69 FR 22906.

⁶ For the 2004 reduction (and related changes), see Amendment 13, Final Rule, 69 FR 22906; for the 2006 reduction, see Framework 42 Final Rule, 71 FR 62156 (Oct. 23, 2006).

⁷ These include the Magnuson-Stevens Act (the federal fishery management statute), the National Environmental Policy Act, and the Regulatory Flexibility Act, among others.

constitute, on the one hand, resources that businesses use in responding to (and, in some cases, working to shape) fishing regulations, and, on the other, characteristics of the businesses that are subject to being changed -- either diminished or intensified -- by new fishing regulations. The study reported on here was designed to address this lack; it investigated the structures and strategies of fishing businesses in New England, in particular, those fishing for groundfish and operating out of Gloucester, Massachusetts.

One question of particular interest to the study was the extent to which fishing businesses use mobility as a strategy: To what extent do fishing businesses move vessels, people, and product (fish) around as they fish, land fish, and sell fish? This question was of particular interest because, while federal law mandates that fishery managers consider the effects of regulation on “fishing communities,” federal fishery regulators have interpreted “fishing communities” to mean *geographical* communities dependent on fishing.⁸ Consequently, fishery management plans consider the effects of regulations on discrete individual “communities” that lie along the coast (the limits of the municipality, town, or county providing the geographic contours of the community). These analyses consider far less the inter-relationships among geographic places or the ways in which commercial fishing can link discrete geographic places and/ or create “fishing communities” that are both smaller and larger than towns, cities, or counties and/or that are less geographically-based than, for example, occupationally-based or practice-based. In inquiring into the mobility practices of fishing businesses in a particular geographical “community,” therefore – the port of Gloucester – the study aimed at learning both about the businesses themselves and about the “communities” created by and contributed to by the businesses.

A note is needed on the use of “fishing business” as the unit of analysis. Much fisheries research makes “vessels” or “fishermen” the unit of analysis; presumably this is because of the interest in quantifying effort in a fishery and because, relatedly, much information about fisheries is collected on a vessel by vessel basis and, though less so, on a fisherman by fisherman basis. This study focuses, instead, on fishing businesses; this is because the focus here is on (a) the people who fish (specifically, those who fish commercially), and (b) the structures they create in order to fish, i.e., their businesses. In making fishing businesses the unit of analysis, moreover, the study takes seriously the insistent admonition heard in the field: commercial fishing *is a business*. In addition, while – as the study shows – fishing businesses that fish for groundfish are small and independent (comprised of a single individual or a small group of individuals), it is wrong to assume that each fishing business owns and runs a single commercial fishing vessel; a focus on fishing businesses avoids this assumption and requires, instead, an inquiry into the number (and types) of vessels owned by individual fishing businesses. Such an inquiry (as was undertaken here) then enables the compilation of a more accurate account of the social and economic organization of commercial fishing in New England. Finally, it should be made clear that, in focusing on fishing *businesses*, the study did not intend to obscure the extent to which families and communities are integral to

⁸ For the regulatory definition, see 50 CFR 600.345.

commercial fishing in New England. Rather, the study seeks to illuminate inter-relationships among fishing businesses, fishing families, and fishing communities.

A brief introduction to the port of Gloucester is required. Gloucester prides itself on being the oldest fishing port in the nation.⁹ In the 20th century, its fishing industry members came both from within the city and environs and from places far afield: among them, the Canadian Maritimes, Portugal, Sicily, Ireland, and various locales within the United States (among them, Michigan, Washington, DC, Connecticut, Washington). In the latter half of the 20th century, its industry members seined and trawled for herring and mackerel, dragged for redfish, ventured to the Grand Banks for swordfish, caught tuna by harpoon, long line, and seine, fished with bottom trawl, gillnet, longline, and other gears for the full range of groundfish species (cod, haddock, yellowtail flounder, and other bottom dwelling species), and, in the 1990s, developed or participated in niche fisheries for sea urchins, slime eels, monkfish, red crab, and other species. Gloucester has a large and well-protected natural harbor, and it is located on Cape Ann, a rocky promontory on the Atlantic Ocean in proximity to the two major fishing grounds off the coast of New England: the Gulf of Maine and Georges Bank.

A cooperative research project in 2003 established that Gloucester was, in 2003, a regional hub port for the New England fishing industry and had been so for a very long time (Robinson et al 2003, 2005). Gloucester's shoreside businesses provide services – a fish auction, other fish buyers, gear supplies, haul-out facilities, and so on – for vessels fishing from the port of Gloucester but also for vessels fishing from ports to the north and south of Gloucester. Gloucester also provides dockage to both resident vessels (vessels for which Gloucester is homeport) and visiting vessels (vessels that fish from Gloucester for temporary periods but that are homeported elsewhere). That study also showed that, while the port had seen many changes over the years, it was, at that time, in the midst of profound changes. Some of these changes were related to the extended downturn in NE groundfish landings since the 1980s. One of these changes, and among the most profound, was a decline, since the 1980s, in the number and percent of large (70-100 feet) fishing vessels resident in the port.

The New England groundfish fishery is and has been very important to Gloucester, even as groundfish landings and revenues have declined in recent years. From 1975 to 2004, ex-vessel revenues from groundfish landings in Gloucester ranged from a high, in 1981, of \$63.7 million (in 2002 dollars) to a low, in 1997, of \$12.6 million (in 2002 dollars), and averaged \$33 million (in 2002 dollars). In 2003 and 2004, revenues from groundfish landings in Gloucester were, respectively, \$18 million and \$18.7 million (in 2003 and 2004 dollars; \$17.6 million and \$17.8 million, respectively, in 2002 dollars). These groundfish revenues were responsible, in this period (1975-2004), for very large percentages of the port's total ex-vessel revenues (revenues from landings of all species combined): from a high (in 1984) of 78% to a low (in 2000) of

⁹ The City of Gloucester's official website introduces the City with these words: "We are America's oldest fishing port. Since 1623, Gloucester has been serving the world as a harvester of quality seafood." See www.ci.gloucester.ma.us.

42%. The average for 1975-2004 was 62%, and in 2003 and 2004, the figures were, respectively, 48% and 57%.¹⁰ Notably, however, at least in recent years (1994-2001, years for which federal data are accessible), vessels landing groundfish in Gloucester have been homeported in the port of Gloucester *and* in ports outside of Gloucester. The number of vessels homeported in Gloucester and landing groundfish, as a percentage of the number of vessels landing groundfish in Gloucester, was, in 1994, 63%, and, in 2001, 57%.¹¹ The absolute number of vessels homeported in Gloucester and landing groundfish from 1994 to 2001 ranged from a low of 124 (in 1998) to a high of 165 (in 1994), and was 149 in 2001. By contrast, the number of vessels landing groundfish in Gloucester in this period (1994 to 2001) ranged from a low of 192 (in 1996) to a high of 279 (in 2000), and was 261 in 2001.¹²

II. Project Methods and Scope of the Report

This study was undertaken as part of a cooperative social science research project involving the combined efforts of social scientists and fishing industry members.¹³ The principal method employed in the study was the development of a long survey and the administration of the survey – by interviews – to a random sample of fishing business owners participating in the groundfish fishery out of Gloucester in 2003. Groundfish business owners in Gloucester were identified through federal permit databases, in the manner described below. In addition, the survey was supplemented by ethnographic fieldwork and by analyses of federal databases.

The sampling frame:

A major aim of the study was the use of random sampling techniques to identify the fishing business owners to be interviewed. The project aimed for random samples of business owners for several, inter-related reasons: (1) to eliminate or reduce bias in

¹⁰ All figures cited thus far in this paragraph are taken from (or calculated from figures in) Robinson et al 2005, and are based on data provided by NOAA Fisheries (see Robinson et al 2005:7 & table 2).

¹¹ These figures were calculated from figures in Tables 607 and 608 of the Final Supplemental Environmental Impact Statement for Amendment 13 to the Northeast Multispecies Fishery Management Plan, Vol. II., pp. II-1561-1562 (Dec. 18. 2003). Note that the numbers of vessels homeported in Gloucester and landing groundfish in Gloucester, as percentages of the total number of vessels landing groundfish in Gloucester, may be overstated in the figures in the text above: This is because the figures for the number of vessels homeported in Gloucester and landing groundfish are for *all* vessels homeported in Gloucester and landing groundfish, *anywhere they land the groundfish* (see *id.*, at p. II-1561). The figures in the text (calculated from these homeported vessels figures) *assume* that the homeported vessels landed their groundfish in their homeport – Gloucester – but this may not have been – and probably wasn't – the case for all the vessels all the time.

¹² See Tables 607 and 608 of the Final Supplemental Environmental Impact Statement for Amendment 13 to the Northeast Multispecies Fishery Management Plan, Vol. II., pp. II-1561-1562 (Dec. 18. 2003).

¹³ See note 1 above.

the selection of interviewees, (2) to maximize the likelihood that the samples would reproduce the various ranges of variation (i.e., across multiple factors) found in the populations, and (3) to enable the use, to the extent appropriate, of inferential statistical techniques (i.e., to permit statistical inferences from the samples to the populations of groundfishing businesses operating in the two ports).

The use of random sampling techniques required identification of the population of groundfish businesses to be sampled (the sampling frame). This presented a challenge, however, as there is no pre-existing list of fishing businesses operating out of Gloucester (nor is there a pre-existing list of fishing businesses operating in the New England region). What there are, however, are various sorts of lists of fishing vessels associated with individual ports (reflecting the focus, in fisheries, on vessels rather than on fishing businesses). After considering a variety of vessel lists,¹⁴ the study settled on the use of a vessel list created from publicly available federal fishing permit data.¹⁵ The list created and used was a list of all federally-permitted commercial fishing vessels in fishing year 2003¹⁶ for which (a) Gloucester was “principal port,” and (b) a multispecies (groundfish) permit had been issued. (The meaning of “principal port” is discussed below.) This Gloucester “principal port” list – a vessel list – functioned as a surrogate for the non-existent list of fishing businesses operating out of Gloucester in 2003 (and fishing for groundfish), and, as such, was used as the sampling frame from which the random sample of groundfishing businesses was drawn for interviews. There were several limitations with the use of this list as the sampling frame (these are detailed

¹⁴ One approach considered for identifying vessels was the use of an ice list – a list of fishing vessels buying ice in Gloucester in a given year. Gloucester’s sole ice company was graciously willing to make available such a list to the project. The virtue of an ice list is it identifies vessels actually operating out of a given port (see Robinson et al 2003). The use of an ice list was rejected after investigation revealed that not all vessels purchase ice when they go fishing; some smaller day vessels do not use ice, and some larger vessels use recycled sea water or other on-board means of cooling fish (while these latter methods are generally not used in fishing for groundfish, the project was interested in all vessels owned or fished by groundfish industry members, including non-groundfish vessels). The potential under-inclusion of certain vessels, both the very small and some of the relatively large, led to the decision not to use ice lists to identify the universe of vessels operating from each port.

¹⁵ Publicly available federal permit data identify all federally-permitted vessels by vessel name, permit number, hull number, vessel owner, vessel owner address and phone number, the “principal port” of the vessel as identified by the vessel owner on initial permit applications and annual permit renewals, the vessel length, the gross tonnage of the vessel, the vessel horsepower, and the fisheries in which the vessel is permitted to participate. In addition, in a separate file, information is provided about the specific categories of permits each vessel holds in each fishery in which it is permitted to participate. (In the case of multispecies (groundfish) permits, as discussed below, there were, in 2003, at the time the federal permit data was used for this study, eleven different groundfish permit categories, seven of which were limited access permits and four of which were open access permits.) The data are available through links from the homepage of the Northeast Regional Office of NOAA Fisheries, www.nero.noaa.gov. Vessel owners must renew vessel fishing permits each fishing year, providing updated information, if any, about their vessels (see 50 CFR 648.4(a)(1)); hence, federal permit data are kept up-to-date.

¹⁶ The fishing year for the groundfish fishery is not a calendar year; instead, it runs from May 1 of a given year to April 30 of the following year. See 50 CFR 648.82(b). The federal permit data used for the study was compiled on March 5, 2004, and hence was valid for the 2003 fishing year.

below), but it was determined that the list was the best available sampling frame, and that, with knowledge of its limitations, good use could be made of it.

The first limitation in using the principal port list as the sampling frame for generating a simple random sample of businesses to interview was the simple fact that the principal port list was a vessel list and not a business list. This limitation was overcome by, essentially, converting the sample of *vessels* drawn from the vessel list into a sample of *businesses*. This was done as follows: A simple random sample of vessel names was generated from the vessel names on the principal port list (using a computerized simple random sample generator). Each vessel name in the sample was then used to generate the name of a fishing business, specifically, the fishing business owning the named vessel. While this may seem self-evident, the consequences of so proceeding are less so: The owner of each fishing business thus identified (and agreeing to be interviewed, see part III for a discussion of response rates) was asked about *all* commercial fishing undertaken in the years inquired into, both on the vessel through which the business was identified (the vessel named in the sample) *and on any other vessels owned or fished by that fishing business in those same years*. In this manner, therefore, the project was able to gather information about all commercial fishing undertaken by a fishing business in a given year. For some fishing businesses, commercial fishing in a given year was limited to that undertaken with the vessel through which the business had been identified (the vessel named in the sample); for other businesses, however, commercial fishing activity in a given year involved an additional vessel or vessels beyond the one through which the business was identified.

The second limitation in using the “principal port” vessel list as the sampling frame was that doing so resulted in a sample that was biased – to an unknown degree – toward businesses that own multiple vessels. This is because businesses with more than one vessel on the principal port list were represented more than one time on the list (as many times as they had vessels on the list) and therefore had more than one opportunity to be selected when the vessels on the list were sampled (as many opportunities as they had vessels on the list). This problem could not be overcome, moreover, by sorting the principal port list by names of vessel owners, identifying and removing multiple instances of the same owner, and then sampling vessel owner names (rather than, as was done, vessel names): Fishing businesses often hold different vessels in different names (in some cases, businesses create corporate entities to hold their vessels, and businesses with multiple vessels create separate corporate entities for each vessel held), and there is no reliable way to identify multiple instances of individual owners (businesses) on the list. We addressed this limitation as follows: First, while we could not ensure that each vessel on the principal port list represented a unique owner or business (for the reason just described), we did confirm that each vessel in the *samples* drawn from the principal port list represented a separate and unique fishing business (we did so in the process of identifying, locating, contacting, and interviewing the owners of the vessels – businesses – in the samples). Second, we acknowledged the fact that, even though the samples consisted of vessels representing unique fishing businesses, the samples were nonetheless biased – to an unknown degree – toward businesses (i.e., vessel owners) that own more than one vessel.

The third limitation in using the principal port list as the sampling frame was that the list likely falls short of being a full and accurate account of each and every vessel that fished out of Gloucester in 2003 (and that had a groundfish permit). This is due to the characteristics of a “principal port” list: A vessel owner identifies the “principal port” of a vessel in permit applications (and renewals); “principal port” is defined in permit applications as the “city and state where the majority of your landings occur.”¹⁷ The list of all federally permitted vessels for which a given port is principal port in a given year, therefore, is a list of all vessels for which a vessel owner has indicated that the port is the one in which, that year, the vessel will land the majority of the fish (or shellfish) it catches. As such, a principal port list for a given year is likely to be a fairly accurate list of the vessels actually using that port that year (at least for landing fish). That said, there is potential for a principal port list for a given year to include vessels that do not use the port that year (to be *overinclusive*) and, conversely, to exclude vessels that do use the port that year (to be *underinclusive*). A principal port list will be *overinclusive* if there are vessels on the list do not in fact fish from (or land fish in) the port that year, either because (a) they are fishing from (and landing fish in) other port(s) that year instead (nothing *obliges* a vessel owner to fish from the vessel’s principal port), or (b) they are not fished at all that year. A principal port list will be *underinclusive* if it fails to include vessels that use the port that year; these would be vessels whose owners have not named the port as principal port but who nonetheless fish the vessels from (or land the vessels’ catch in) the port. Vessel owners are limited to a single “principal port,” but there is no restriction on using multiple ports in a given year (or on using a port other than a vessel’s principal port); hence, vessel owners that did not name Gloucester as their vessels’ principal port in fishing year 2003 may nonetheless have fished from Gloucester in fishing year 2003.¹⁸ The potential for the Gloucester principal port list to be both overinclusive and underinclusive could not be overcome and is simply noted.¹⁹ Despite this likely over- and under-inclusiveness, the principal port list for 2003 was the most complete list available of the vessels (and, hence, the fishing businesses) operating out of Gloucester in 2003.

Finally, the fourth and last limitation in using the principal port list as a sampling frame concerned the extent to which the list accurately identified the vessels

¹⁷ See National Marine Fisheries Service, Northeast Regional Office, Fisheries Statistics Office, *Initial Vessel Application, Instructions for Northeast Federal Fishing Vessel Permits* (OMB# 0648-0202, revised 4/10/2007, expires 11/30/2009).

¹⁸ On this point, federal data show that, in each year from 1994-2001 (years for which the data are available), nearly twice the number of vessels landed groundfish in Gloucester as were homeported in Gloucester and landing groundfish. It is probably fair to assume that some of the vessels landing groundfish in Gloucester did not identify Gloucester as principal port, i.e., some of the vessels landing groundfish in Gloucester that were not homeported in Gloucester). See discussion at the end of Part I.

¹⁹ The only way to ascertain whether vessels on the Gloucester principal port list in 2003 actually landed fish in Gloucester in 2003 would have been to compare the principal port list with a list of vessels actually landing fish in Gloucester in 2003. We did not explore whether it would be possible to obtain such a list from NOAA Fisheries; confidentiality issues, among others, could well obviate such a request.

(businesses) *participating in the groundfish fishery* in fishing year 2003. As indicated, the list identified all vessels whose owners named Gloucester as principal port in 2003 and that had a multispecies (groundfish) permit in 2003.²⁰ The list thus captured all vessels (businesses) *permitted* to participate in the groundfishery in 2003 and operating from Gloucester (noting the above “principal port” caveats above). However, some vessels permitted to fish for groundfish in 2003 did not fish for groundfish in 2003: federal data indicate that, in 2003, fishery-wide, 66% of the vessels with Days-at-Sea (DAS) limited access groundfish permits did not use their permits in 2003 (i.e., did not “call in” and, therefore, presumably did not fish for or land groundfish).²¹ Thus, there was no way to be sure (or even reason to think) that the principal port list consisted entirely of vessels (businesses) actually participating in the groundfishery in 2003. This limitation was addressed simply by recognizing that, in using the list to sample vessels (businesses), we were sampling vessels (businesses) with permits to participate in the groundfishery in 2003 that may or may not have actually participated in the groundfish fishery in 2003.

A limited access days-at-sea sample and a handgear sample:

The principal port list created for Gloucester for 2003 is described in detail in Part III below. In addition, two subsets of the principal port list are also described in detail: one, the subset of vessels on the list with *limited access days-at-sea (DAS)* groundfish permits, and the other, the subset of vessels with groundfish permits other than limited access DAS permits (90% of which were vessels with *handgear* groundfish permits). As described in Part III, it was decided, after a vessel sample was generated from the full principal port list and initial interviewing had begun, to divide the vessel sample into two sub-samples, a limited access DAS vessel sample and a handgear vessel sample, and to expand the limited access DAS vessel sample. This decision to divide the original vessel sample into two (and to expand the limited access DAS vessel sub-sample) is described in Part III. So, too, are the resulting two samples and their response rates.

Also, as indicated, Part III describes two subsets of vessels on the principal port list: (1) the subset with limited access DAS permits, and (2) the subset with groundfish permits other than limited access DAS permits: It details the number of vessels in the two subsets, the lengths of the vessels in the two subsets, and the specific types of groundfish permits on the vessels in the two subsets. Part III also contains an analysis of the limited access DAS vessels owned by the business owners in the limited access DAS sample (the full set of which could not be known until the limited access DAS vessel sample was converted to a business sample and the business owners were

²⁰ Also as indicated, the permit information was valid for *fishing year* 2003, which ran from May 1, 2003 to April 30, 2004 (see 50 CR 648.82(b), 10-1-2003 ed.); hereafter “2003” will signify *fishing year* 2003 unless otherwise indicated.

²¹ Fishery-wide, there were 1404 DAS limited access groundfish permits in fishing year 2003; of these, 931, or about 66%, were active; see Framework 42 to the Northeast Multispecies Fishery Management Plan, Final Document, 4-21-2006, p. 178 (table 31).

interviewed²²). The analysis of the limited access DAS vessels owned by the owners in the sample compares the owners' limited access DAS vessels with the full set of limited access DAS vessels on the principal port list (i.e., the limited access DAS vessel subset on the principal port list).

The survey instrument:

The study developed a survey instrument for use in interviewing the vessel owners (business owners) in the samples about their fishing businesses.²³ The survey inquired into vessel owners' business and fishing practices in three discrete years: fishing year 2003 and two prior years, 1993 and 1983. Fishing year 2003 was a critical year for two reasons: First, the vessel (business) samples had been created from the fishing year 2003 principal port list. Second, and importantly, fishing year 2003 was the year just prior to the year in which two major changes in groundfish regulation occurred (both took effect at the start of fishing year 2004): The first change was the implementation of the long anticipated regulations implementing the 10-year rebuilding plans for 11 of the 19 groundfish stocks; these included new qualifications for maintaining DAS permits and vessel-specific reductions in DAS. The second change was the implementation of regulations permitting, for the first time since the creation of the limited access fishery and DAS effort control program for the limited access fishery, the transfer of DAS from one vessel to another. By inquiring into business and fishing practices in fishing year 2003, therefore, the survey was intended to – and did – enable the characterization of the groundfishing businesses operating out of Gloucester the year *before* the major changes in groundfish regulations went into effect.

The survey also inquired into the vessel owners' business and fishing practices in 1993 and 1983, in order to learn about *their histories* of business and fishing practices. The survey results for 1993 and 1983 cannot be used to characterize the full set of groundfishing businesses operating out of Gloucester in 1993 and 1983. This is because the full set of groundfishing businesses operating out of Gloucester in these two years were not sampled; rather, the full set of groundfishing businesses operating out of Gloucester *in 2003* was sampled. However, the information about practices in 1993 and 1983 is highly useful for what it can reveal about the practice histories (the experiences and undertakings) of fishing business owners active in Gloucester in 2003. The years 1993 and 1983 were chosen for the survey both (1) because, taken together with the 2003 data, they span a long period (21 years) in the groundfishery, and (2) because of the particular significances of the two years. Thus, 1993 was the last year in which the commercial groundfish fishery (much of it) was open access: in 1994, a major part of the commercial fishery was made into a limited access fishery and the DAS effort control program for limited access vessels was adopted.²⁴ Also, 1993 was a year in

²² See the sampling frame discussion above.

²³ See note 1.

²⁴ See Amendment 5 to the Northeast Multispecies Fishery Management Plan, Final Rule, 59 FR 9872 (March 1, 1994).

which combined (domestic) groundfish landings – and stock abundance indices – were declining to a period of record lows (occurring in the middle and late 1990s).²⁵ By contrast, 1983 was a year in which (domestic) groundfish landings were close to their post-Magnuson Act high, and it was also the year *before* the International Court of Justice rendered its decision (in 1984) on the offshore boundary between the United States' and Canada's respective exclusive economic zones.²⁶

Locating, contacting, and interviewing the vessel (business) owners:

While the samples of vessel names included vessel owner names, addresses, and phone numbers (from the federal permit data included on the principal port list), in many cases, the owner names were corporate names. For vessels with corporate owners, it was necessary to identify and locate the individual(s) who were shareholders of the corporation. This was done through basic ethnographic fieldwork: by searching for the vessels themselves in port, asking known key informants for the vessels' whereabouts and the owner(s)' name(s), trying the corporate phone numbers, and web searches. In addition, fieldwork was also required to find working phone numbers for some of the individual (non-corporate) vessel owners in the samples. Finally, some vessels in the samples had been sold – sometime between the time the vessels appeared on the 2003 principal port lists from which the samples were created and the time the interviews took place – and fieldwork was required to identify and locate the vessels' 2003 owners.

The survey was administered by interviews. Approximately half of the interviews were conducted by industry interviewers (Sherman, King and Briscoe) and half by an anthropologist (Robinson), and all but three (two where owners were out of state) were conducted in person (in interviewees' or interviewer's homes, in pilot houses and in galleys, and on docks).²⁷ Interviews ran from about 45 minutes to several hours. While response rates were high (see below), it needs be noted that this was due in large part to the persistence of the interviewers and, in some cases, to the existence of pre-existing relationships between interviewer and interviewee. Many vessel owners were not at all keen in participating in “yet another” survey; to quote one vessel owner, “I get interview requests from NOAA all the time; they go in the trash. I have no interest in it. All that stuff is a waste of time.”

²⁵ For landings (and relative abundance indices) for the “principal groundfish and flounder stocks off the U.S. northeast” in the period 1960 -1997, see Murawski et al 1999: 6 (figure 5); for total domestic landings of all 19 large mesh groundfish stocks regulated as part of the New England groundfish (“northeast multispecies”) management plan in the period 1975-2003, see Robinson et al 2005: table 1.

²⁶ For landings figures, see Murawski et al 1999, and Robinson et al 2005; for the International Court of Justice decision, see ICJ 1984.

²⁷ Robinson conducted 69% of the limited access DAS vessel owner interviews and 14% of the handgear vessel owner interviews; Sherman, and King and Briscoe, conducted 31% of the limited access DAS vessel owner interviews, and King and Briscoe conducted 86% of the handgear vessel owner interviews.

The antipathy toward “NOAA” interviews (which lingered even after it was explained this was not a NOAA project) was fueled, for many, by grim events in the regulatory arena in 2005 and 2006: In 2005, one year after the 2004 adoption of the 10-year rebuilding plans (and accompanying new qualifications for maintaining DAS and new vessel-specific reductions in DAS), it was determined that the much worked-on 2004 restrictions were insufficient to implement the 2004 rebuilding plans. Two sets of new restrictions were developed for 2006, the first a set of “emergency” rules, the second a set of regulations issued in due course; the latter, still in effect, imposed a further DAS reduction as well as a 2:1 DAS counting rule for vessels fishing in two large areas of ocean, one in the inshore Gulf of Maine (running shoreside from Cape Cod to Southern Maine), and the other in Southern New England. Vessels fishing in the “2:1 areas” thus had a further *de facto* DAS cut of 50%. Further, the 2004 rules had included, for the first time, mechanisms for transferring DAS from one vessel (permit) to another, and many vessel (business) owners were preoccupied with changes being wrought by the buying and selling of permits and the leasing of DAS. It was (and still is) a chaotic and difficult time for many vessel (business) owners in the groundfish industry. For many, a request to participate in a research project such as this one seemed, at best, beside the point. Nonetheless, as indicated, our response rates were, in fact, very high, and when vessel owners did finally agree to interviews, they were, in the end, gracious, engaged, and forthcoming, if, nonetheless, skeptical.²⁸

The scope of the report:

This report presents and analyzes a subset of the data collected in the study. The report presents and analyzes the data from the interviews of the sample of limited access DAS vessel (business) owners, in particular, the data about the limited access DAS vessel (business) owners’ personal backgrounds, their careers in commercial fishing, their business structures and practices in 2003, and their businesses’ fishing and mobility practices in 2003. The report does not examine the data collected about the limited access DAS vessel (business) owners’ business structures and practices, and fishing and mobility practices, in 1983 and 1993. It does not, in other words, examine the information collected about the limited access DAS vessel (business) owners’ *histories*. In addition, and separately, this report does not present and analyze the data from the interviews of the sample of handgear vessel owners.

This data not yet analyzed (the 1983 and 1993 data for the limited access DAS vessel owners and the data from the handgear vessel owner interviews) is extremely valuable and will be analyzed at a later date. The decision to defer analysis of the 1983 and 1993 limited access DAS data and the handgear data was made because of the large volume of data collected by the project, and the need to prioritize analyses of this data. It was decided that the first priority for analysis would be the limited access DAS

²⁸ Following interviews, vessel owners were sent a thank you letter, which included an honorarium of \$50; the letter stated that the \$50 was “offered as a thank you,” but that the \$50 was “a token amount” and offered “only as token and not as payment.”

vessel (business) owners and their practices in 2003, the year just before the 10-year rebuilding plans and the DAS transferability provisions went into effect.

III. Results

1. The Gloucester Principal Port List

The Gloucester “principal port” list created for this study from federal fishing permit data consisted, as indicated above, of a list of the names of all federally-permitted commercial fishing vessels: (a) whose owners had identified Gloucester as the vessel’s “principal port” for fishing year 2003, and (b) that had a multispecies (groundfish) permit in 2003 (in any groundfish permit category). In this section, the vessels on this principal port list are described; provided are: (1) the number of vessels; (2) the sizes (lengths) of the vessels; (3) the vessels’ ‘home’ locations; and (4) the specific permit categories of the groundfish permits on the vessels. In addition, two subsets of the principal port list are characterized: the subset of vessels with limited access DAS permits (permit categories A, B, D, F, and G) and the subset of vessels with permits other than limited access DAS permits (permit categories H, I, J, K).

The entire principal port list:

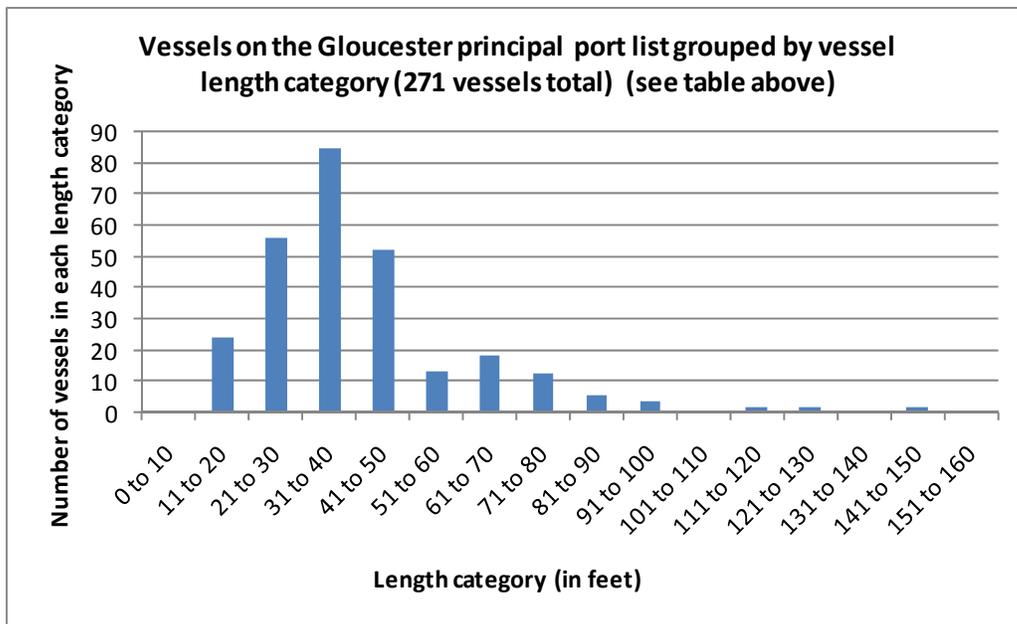
Number of vessels: In fishing year 2003, 307 vessels with federal fishing permits identified Gloucester, MA, as principal port.²⁹ Of these 307 vessels, 271 vessels, or 88%, had federal groundfish permits, in any groundfish permit category (groundfish permits are known as “northeast multispecies” permits). These 271 vessels comprise the entire Gloucester “principal port” list.

Vessel lengths: Analysis of the lengths of the vessels on the 2003 Gloucester principal port list indicates the extent to which, in 2003, Gloucester was a “small boat” port. As shown in the tables and chart below, the mean length of the 271 vessels on the principal port length was 41 feet, and the median of the vessel lengths was 38 feet. Also, 85% of the vessels (230/271) were 60 feet in length or smaller.

²⁹ The 307 vessels include *federally-permitted* vessels only. State-permitted Gloucester vessels in 2003 that did not also have federal fishing permits in 2003 are not included among the 307 vessels.

Vessel lengths for all vessels on the Gloucester 'principal port list' (all vessels with groundfish permits - any category - with Gloucester as principal port in 2003) (271 vessels total)

| <i>Length category (feet)</i> | <i>Number of vessels</i> | <i>Cumulative number of vessels</i> | <i>Percent of vessels</i> | <i>Cumulative percent of vessels</i> |
|-------------------------------|--------------------------|-------------------------------------|---------------------------|--------------------------------------|
| 0 to 10 | 0 | 0 | 0% | 0% |
| 11 to 20 | 24 | 24 | 9% | 9% |
| 21 to 30 | 56 | 80 | 21% | 30% |
| 31 to 40 | 85 | 165 | 31% | 61% |
| 41 to 50 | 52 | 217 | 19% | 80% |
| 51 to 60 | 13 | 230 | 5% | 85% |
| 61 to 70 | 18 | 248 | 7% | 92% |
| 71 to 80 | 12 | 260 | 4% | 96% |
| 81 to 90 | 5 | 265 | 2% | 98% |
| 91 to 100 | 3 | 268 | 1% | 99% |
| 101 to 110 | 0 | 268 | 0% | 99% |
| 111 to 120 | 1 | 269 | 0% | 99% |
| 121 to 130 | 1 | 270 | 0% | 100% |
| 131 to 140 | 0 | 270 | 0% | 100% |
| 141 to 150 | 1 | 271 | 0% | 100% |
| 151 to 160 | 0 | 271 | 0% | 100% |



To complete the overall picture of the vessels in the port of Gloucester in 2003, the vessel lengths of the vessels on the Gloucester principal port list (vessels with Gloucester as principal port and with groundfish permits) may be compared with the vessel lengths of the full set of vessels with federal fishing permits and Gloucester as

principal port in 2003 (those with groundfish permits and those without groundfish permits), and with the vessel lengths of the vessels with federal fishing permits, *but no groundfish permit*, and Gloucester as principal port in 2003. As shown in the table below, the median of the vessel lengths of vessels with groundfish permits was 38 feet, the median of the vessel lengths of vessels without groundfish permits was 32 feet, and the median of all vessels (with and without groundfish permits) was 35 feet.

Comparison of vessel lengths on Gloucester principal port list in 2003 with vessel lengths of other 'Gloucester' vessels in 2003 (lengths in feet) (see text)

| 'Gloucester' vessel list type | mean length | median length | minimum length | maximum length | range (max - min) |
|---|-------------|---------------|----------------|----------------|-------------------|
| Gloucester principal port list: all vessels with groundfish permits (n=271) | 41 | 38 | 14 | 141 | 127 |
| all vessels with any federal fishing permit and Gloucester as principal port (n=307) | 40 | 35 | 12 | 141 | 129 |
| all vessels with federal fishing permit <i>but no groundfish permit</i> and Gloucester as principal port (n=36) | 31 | 32 | 12 | 49 | 37 |

Vessels' 'home' locations: An analysis was undertaken of the 'home' locations of the 271 vessels on the Gloucester principal port list. By 'home' location is meant simply the town or city indicated in the vessel owner address for the vessel (taken from the federal permit database with which the Gloucester principal port list was created). *This analysis of vessels' home locations should not be equated with an analysis of the 'home' locations of vessel owners (i.e., or fishing businesses).* As discussed in Part II, some businesses owned multiple vessels, and these businesses are over-represented on the vessel list (each vessel they own functions as a separate entry of the business on the list).

The 'home' locations of the 271 vessels on the 2003 Gloucester principal port list spanned 59 towns or cities in 8 states. Sixty-five percent (65%) of the vessels, however, had addresses in Gloucester, Massachusetts. Another 21% listed cities or towns within 1-30 driving miles from Gloucester, for a total of about 87% in Gloucester or within 30 driving miles of Gloucester. (The number of "driving miles" signifies the number of miles to drive from the center of the city or town listed to the center of Gloucester according to driving routes suggested in searching for directions on Google Maps, maps.google.com). Another 6% listed cities or towns within 31-50 driving miles from Gloucester, for a total of almost 93% in Gloucester or within 50 driving miles of Gloucester. Another 4% listed cities or towns from 51 to 100 driving miles from Gloucester, for a total of 97% in Gloucester or within 100 driving miles of Gloucester. Finally, 2% listed cities or towns between 101-200 driving miles from Gloucester, and

1% listed cities or towns from 1000-3100 driving miles from Gloucester. See the table below.

Distances from Gloucester (in driving miles) of the 'home' locations of all vessels on the Gloucester principal port list (fishing year 2003)

| Distance from Gloucester | Number of vessels | Percent of vessels | Cumulative percent of vessels |
|--------------------------|-------------------|--------------------|-------------------------------|
| 0 | 177 | 65% | 65% |
| 1 to 10 | 22 | 8% | 73% |
| 11 to 20 | 30 | 11% | 85% |
| 21 to 30 | 6 | 2% | 87% |
| 31 to 40 | 6 | 2% | 89% |
| 41 to 50 | 10 | 4% | 93% |
| 51 to 60 | 2 | 1% | 93% |
| 61 to 70 | 6 | 2% | 96% |
| 71 to 80 | 0 | 0% | 96% |
| 81 to 90 | 0 | 0% | 96% |
| 91 to 100 | 1 | 0% | 96% |
| 101 to 110 | 1 | 0% | 96% |
| 111 to 120 | 1 | 0% | 97% |
| 121 to 130 | 1 | 0% | 97% |
| 131 to 140 | 2 | 1% | 98% |
| 141 to 150 | 1 | 0% | 98% |
| 151 to 160 | 0 | 0% | 98% |
| 161 to 170 | 0 | 0% | 98% |
| 171 to 180 | 0 | 0% | 98% |
| 181 to 190 | 1 | 0% | 99% |
| 191 to 200 | 0 | 0% | 99% |
| 201 to 210 | 1 | 0% | 99% |
| 1000 - 3100 | 3 | 1% | 100% |
| | 271 | 100% | |

Notes:

1. "0" miles signifies that listed address is in Gloucester
2. "driving miles" calculated using Google Maps (maps.google.com)

Groundfish permit categories: In order to describe the permit categories of the groundfish permits on the vessels on the principal port list, it is (unfortunately!) necessary to discuss briefly the categories of groundfish permits in existence in fishing year 2003, the year for which the principal port vessel list was compiled. That year, federal regulations provided for 11 multispecies (groundfish) permit categories. All but one of these 11 permit categories were, technically speaking, commercial permit categories as all but one allowed the sale of fish caught under the permits. The one

exception was the “party/charter” permit category, which prohibited the sale of fish caught under the permit.³⁰

Of the 11 permit categories, seven were limited access permit categories that had been in effect since the mid-1990s; of these, six were **limited access days-at-sea (DAS) permit categories**, i.e., categories of permits which required the use of DAS and each permit of which carried a specific, vessel-specific DAS allocation (the number of DAS the vessel was permitted to use in the given fishing year).³¹ Vessels with permits in these six groundfish permit categories are treated, in the groundfish management plan, as the vessels constituting the “commercial” groundfish fishery and are subject to a common set of “commercial fishery management measures.”³² Not the least of these common measures is the requirement to use allocated DAS to fish for groundfish and the associated prohibition on fishing for groundfish when each year’s allocation of DAS has been used (see 50 CFR 648.82). Other common requirements include prohibitions on fishing in closed areas of ocean, some that are closed year-round and some that are closed part of the year each year (50 CFR 648.81), area-specific gear restrictions and specifications (for bottom trawl, gillnet, longline, and other gear types) (50 CFR 648.80 and 648.84), minimum fish sizes (50 CFR 648.83), stock-specific trip limits (50 CFR 648.86) and others.

In addition to the seven limited access permit categories that had been in effect since the mid-1990s (the six limited access DAS permit categories and the one other), there was, in 2003, a *new* limited access permit category. This was a **handgear permit category**. Up until August 1, 2002, this handgear permit category had been an *open access* permit category (i.e., new permits continued to be available in this category until August 1, 2002), but, as of that date, existing handgear permits became, effectively, limited access permits, as new regulations were issued providing that no handgear permits would be issued after August 1, 2002.³³ The rules governing the use of these

³⁰ Charter/party vessels, which carry passengers for hire (and so are commercial in that sense), are considered “recreational” vessels because the fishing that takes place from them is recreational, and, importantly, because regulations prohibit the sale of fish caught on such vessels when they are fishing under a party/charter permit (type “I”) (see 50 CFR 648.89(d) (10-1-2003 ed.)). None of the other 10 federal groundfish permit categories in effect in 2003 prohibited the sale of fish (see the table in the text following; today, too, the charter/party permit type is the sole groundfish permit type for which the sale of fish is prohibited (cf. 50 CFR 648.89(d))).

³¹ The seventh limited access permit category that had been in effect since the mid-1990s – the one that was not a limited access DAS permit category – was the “small vessel” permit category; this category had applied to eligible vessels that were 30 feet and smaller. Vessels with permits in this category were not limited to an allocation of DAS but were limited to a combined catch of cod, haddock, and yellowtail flounder of 300 pounds per trip (see table in the text, and 50 CFR 648.82.) (There were no vessels on the Gloucester principal port list with groundfish permits in this category; see text following.)

³² See, e.g., Amendment 13 to the Northeast Fishery Management Plan, Final Document, section 3.6 (“Commercial Fishery Management Measures”), p. I-83 (Dec. 18, 2003).

³³ Regulations that went into effect in 2002 -- in response to a court order mandating certain regulatory changes during an interim period in which the 10-year stock rebuilding plans and attendant

newly limited access handgear permits were a requirement that only handgear – rod and reel and handline -- be used to fish for groundfish, and a limit on the combined catch of cod, haddock, and yellowtail flounder to 300 lb per trip (and the combined catch of cod and yellowtail flounder to 200 lb per trip) (see 50 CFR 648.88(a), 10-01-2003 ed.). It should be pointed out that, as indicated, the sale of fish caught under a handgear permit was not prohibited, and so the permit category is, technically, a commercial groundfish permit category. Vessels with these handgear permits, however, are not subject to the “commercial fishery management measures” (the measures governing the limited access DAS vessels) but to measures directed specifically at the vessels with permits in the handgear permit category (the gear limitation and the possession limitations just described).³⁴

Finally, there were, in addition, three more groundfish permit categories in effect in 2003, but only one of them was a permit category for vessels targeting groundfish. This was the **charter/party permit category**. Unlike the permit categories described thus far, this was an open access permit category (i.e., new permits in the category were available to be issued). The charter/party permit enabled a vessel to take passengers for hire to fish for groundfish species, but it limited the gear that could be used to one line per angler, two hooks per line, and it prohibited the sale of fish caught under the permit (see 50 CFR 648.89, 10-01-2003 ed.). Like the vessels with handgear permits, the vessels with charter/party permits were not subject to the “commercial fishery management measures” (the measures governing the limited access DAS vessels) but to their own, charter/party-specific set of rules (the one line per angler, two hooks per line requirement, and the prohibition on the sale of fish). The remaining two groundfish permit categories in effect in 2003 were (a) an “open access” permit category for limited access scallop vessels enabling the scallop vessels to possess 300 lb of groundfish bycatch, 50 CFR 648.88(c), 10-01-2003 ed.), and (b) an open access permit category that was not actually a permit to fish for the 12 species (in 19 stocks) of groundfish that the other 10 “groundfish” permit categories allowed (i.e., cod, haddock, yellowtail flounder, etc.) but a permit to fish for certain separately regulated “small mesh” groundfish species (whiting, red hake, and offshore hake).

All 11 ‘groundfish’ permit categories in effect in fishing year 2003 are described in the table below³⁵:

regulations were being prepared – provided that no new handgear only permits would be made available after August 1, 2002. See 50 CFR 648.88 (10-1-2003 ed.).

³⁴ The characteristics of the handgear vessel owners’ groundfish fishery – including the extent to which and the manner in which this fishery should be understood as a “commercial” fishery – are among the questions to be addressed in the analysis of the data from the handgear vessel sample in the future.

³⁵ Most of these permit categories remain in effect in 2006; one change is that “fleet” DAS permits (“B” permits) have been eliminated and vessels formerly holding B permits now hold individual DAS (“A”) permits. See 50 CFR 648.82.

Multispecies (Groundfish) Permit Categories in Fishing Year 2003

| Name | Type | Brief Description (not a full account of eligibility or use requirements) |
|---|--|--|
| <i>"commercial fishery" permit categories (limited access DAS permit categories in effect since the mid-1990s, including the 6 limited access DAS permit categories) :</i> | | |
| A | individual DAS permit | a DAS permit for vessels that, based on fishing history, established entitlement to an individually determined number of annual DAS; permit required, among things, use of an electronic vessel monitoring system |
| B | fleet DAS permit | a DAS permit for vessels that did not establish entitlement to an "individual" DAS permit but otherwise met requirements for a DAS permit; in the initial allocation of fleet permits, all fleet permit holders were entitled to the same number of annual DAS; fleet DAS permits required, among other things, the use of a call-in system <i>or</i> an electronic vessel monitoring system |
| C | small vessel exemption permit | a "small vessel exemption" permit: a non-DAS limited access permit; applied only to vessels 30 feet and under; combined catch of cod, haddock, and yellowtail flounder may not exceed 300 pounds per trip |
| D | hook gear only permit | a "hook gear only permit": a fleet DAS permit that required the use of hook gears only: longlines, tub trawls, rod and reel, or handlines |
| E | combination permit | a DAS permit category for certain vessels participating in the limited access sea scallop fishery and the groundfish (multispecies) fishery |
| F | large mesh individual DAS permit | a DAS permit for fleet (type A) DAS permits electing to fish with large mesh |
| G | large mesh fleet DAS permit | a DAS permit for individual (type B) DAS permits electing to fish with large mesh |
| <i>handgear permits ("open access" permits made limited access permits as of August 1, 2002)</i> | | |
| H | handgear permit | a permit category that was "open access" until August 1, 2002, on which date H permits were made available only to vessels that had previously held them or whose owners had applied for them before that date; vessels with H permits were required to use rod and reel or handline; limited to 300 lb of haddock, cod, and yellowtail flounder, combined per trip (but only 200 lb of cod and haddock, combined, per trip) |
| <i>charter/party permits (open access permits)</i> | | |
| I | charter/party permit | an open access permit for vessels carrying passengers for hire; vessels limited to rod and reel or handline, each passenger limited to one line, two hooks; <i>the sale of fish caught is prohibited</i> |
| <i>miscellaneous permit categories (not for targeting cod, haddock, yellowtail , etc.)</i> | | |
| J | multispecies bycatch permit for scallop permit holders | an open access permit for vessels with <i>limited access scallop permits</i> , enabling the possession of 300 pounds of groundfish; other restrictions also apply |
| K | small mesh multispecies permits | an open access permit for the "small mesh" groundfish species (whiting, red hake, offshore hake) |
| sources: 50 CFR 648.4, 648.82, 648.88, 648.99 (10-1-2003 ed.), and National Marine Fisheries Service, Northeast Regional Office, Fisheries Statistics Office, <i>Initial Vessel Application, Instructions for Northeast Federal Fishing Vessel Permits</i> (OMB# 0648-0202, revised 4/10/2007, expires 11/30/2009). See generally 50 CFR 648.80 - 648.97. | | |

Groundfish permit categories of the vessels on the Gloucester principal port list. Having described the groundfish permit categories in effect in fishing year 2003, the permit categories of the vessels on the 2003 principal port list may now be described. As the table below shows, 145 of the vessels with groundfish permits and Gloucester as principal port in 2003, or 54% of the vessels (145/271), had permits in the limited access permit categories in effect since the mid-1990s. (As shown below, moreover, all of these 145 vessels had limited access DAS permits.) The remaining 46% of the vessels with groundfish permits and Gloucester as principal port in 2003, 126 vessels out of 271, had permits in the handgear, charter/party, or small mesh (whiting, etc.) categories, or some combination of permits in these categories.

| Breakdown of Groundfish Permit Categories on the Vessels on the Gloucester Principal Port List (the list of all vessels with groundfish permits in 2003 and Gloucester as principal port) (271 vessels total) | | |
|--|-------------------|---|
| <i>Permit categories</i> | number of vessels | percent of all groundfish permitted vessels with Gloucester as principal port in 2003 |
| all vessels with permits in limited access categories in effect since the mid-1990s (permit categories A-G) | 145 | 54% |
| all vessels with permits in categories H, I, J, or K (H, I, and K permits could be combined) | 126 | 46% |

The 145 vessels with limited access DAS permits in 2003

Limited access DAS permit types of the 145 vessels: The 145 vessels with permits in one of the limited access permit categories in effect since the mid-1990s had permits as follows: 11% (16/145) had type “A” individual DAS permits, 77% (112/145) had type “B” fleet DAS permits, 8% (12/145) had type “D” hook only (longline, tub trawl, etc.) DAS permits and 3% (5/145) had type “F” or type “G” “large mesh” DAS permits. All thus had limited access DAS permits (none had type “C” permits).

Vessel lengths of the 145 vessels: The vessel lengths of the 145 vessels with limited access DAS permits in 2003 and Gloucester as principal port are shown in the tables and chart below. As shown, the median length was 48 feet, the minimum length

was 18 feet and the maximum was 111 feet. Seventy-eight percent (78%) of the vessels were 60 feet or smaller, and 89% of the vessels were 70 feet or smaller.³⁶

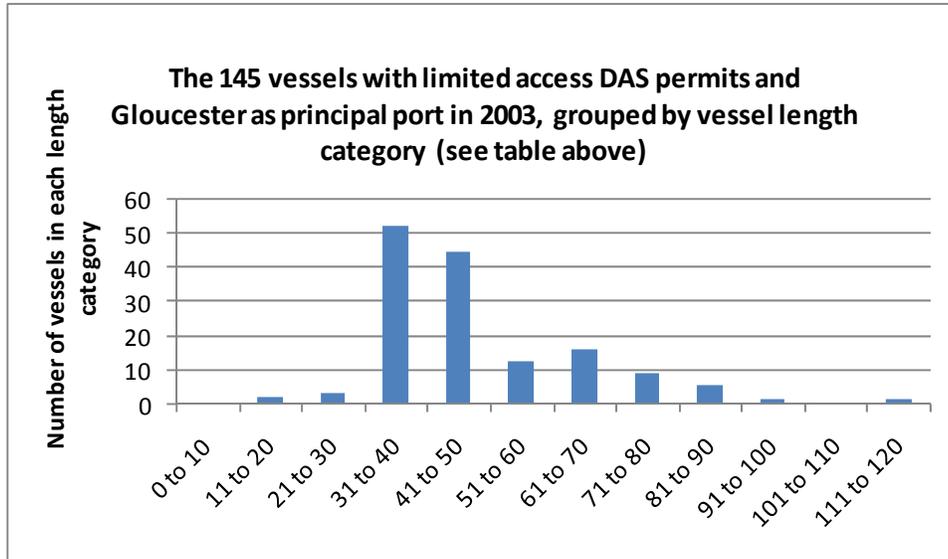
Vessel lengths of the 145 vessels with limited access DAS permits and Gloucester as principal port in 2003 (lengths in feet) (see text)

| | mean length | median length | minimum length | maximum length | range (max - min) |
|--|-------------|---------------|----------------|----------------|-------------------|
| all vessels with limited access DAS permits and Gloucester as principal port in 2003 | 48.2 | 42 | 18 | 111 | 93 |

Vessel lengths for the 145 vessels with limited access DAS permits and Gloucester as principal port list in fishing year 2003

| <i>Length category (feet)</i> | <i>Number of vessels</i> | <i>Cumulative number of vessels</i> | <i>Percent of vessels</i> | <i>Cumulative percent of vessels</i> |
|-------------------------------|--------------------------|-------------------------------------|---------------------------|--------------------------------------|
| 0 to 10 | 0 | 0 | 0% | 0% |
| 11 to 20 | 2 | 2 | 1% | 1% |
| 21 to 30 | 3 | 5 | 2% | 3% |
| 31 to 40 | 52 | 57 | 36% | 39% |
| 41 to 50 | 44 | 101 | 30% | 70% |
| 51 to 60 | 12 | 113 | 8% | 78% |
| 61 to 70 | 16 | 129 | 11% | 89% |
| 71 to 80 | 9 | 138 | 6% | 95% |
| 81 to 90 | 5 | 143 | 3% | 99% |
| 91 to 100 | 1 | 144 | 1% | 99% |
| 101 to 110 | 0 | 144 | 0% | 99% |
| 111 to 120 | 1 | 145 | 1% | 100% |

³⁶ Moreover, of the 11% of vessels over 70 feet (16/145), five vessels were charter/ party vessels that, for some reason, did not have charter/party permits but, instead, had type B, fleet DAS limited access permits. Removing these five charter/party vessels from the limited access DAS subset leaves only 11/140 vessels, or 8% of the limited access DAS vessels, over 70 feet in length. (The fact that the five vessels were party/charter vessels was gleaned through ethnographic work.)



The 126 vessels with groundfish permits other than limited access DAS permits (handgear, charter/party, etc.) in 2003:

Permit categories of the 126 vessels: The 126 groundfish permitted vessels with Gloucester as principal port in 2003 that did *not* have limited access DAS permits consisted, in the main, of vessels with handgear permits: Ninety percent (90%) of these vessels (114/126) had handgear permits. Twenty percent (20%), or 25/126, had charter/party permits, and 32% had small mesh (whiting, etc.) permits (see the permit category table above for information on these permit types). Note that handgear, charter/party, and small mesh (whiting, etc.) permits could be, and were, combined, and therefore the percentages of each of these permit types do not sum to 100%. See the table below.

| Groundfish permit categories on the 126 vessels with Gloucester as principal port in 2003 with groundfish permits other than limited access DAS permits vessels | | |
|--|-------------------|---|
| <i>permit types</i> | number of vessels | percent of all vessels with groundfish permits other than non-limited access DAS permits* |
| all vessels with permits in handgear category (permit category H), with or without other I or K permits | 114 | 90% |
| all vessels with permits in charter/party category (permit category I), with or without H or K permits | 25 | 20% |
| all vessels with "J" permits | 0 | 0% |
| all vessels with "K" permits, with or without H or I permits | 40 | 32% |
| <i>* H, I, K permits could be (and were) combined, so percents do not sum to 100%</i> | | |

Vessel lengths of the 126 vessels: The vessel lengths for the 126 vessels with groundfish permits other than limited access DAS permits are shown below. As shown, the median length of all 126 vessels is 28 feet, and the median length of the handgear permitted vessels (all vessels with handgear (H) permits, whether or not they also have I or K permits) was 26 feet. Hence, the 126 vessels – and the handgear vessels taken alone – are considerably smaller than the vessels with limited access DAS permits. For the latter, the median length was 42 feet (see the limited access DAS vessel length table above).

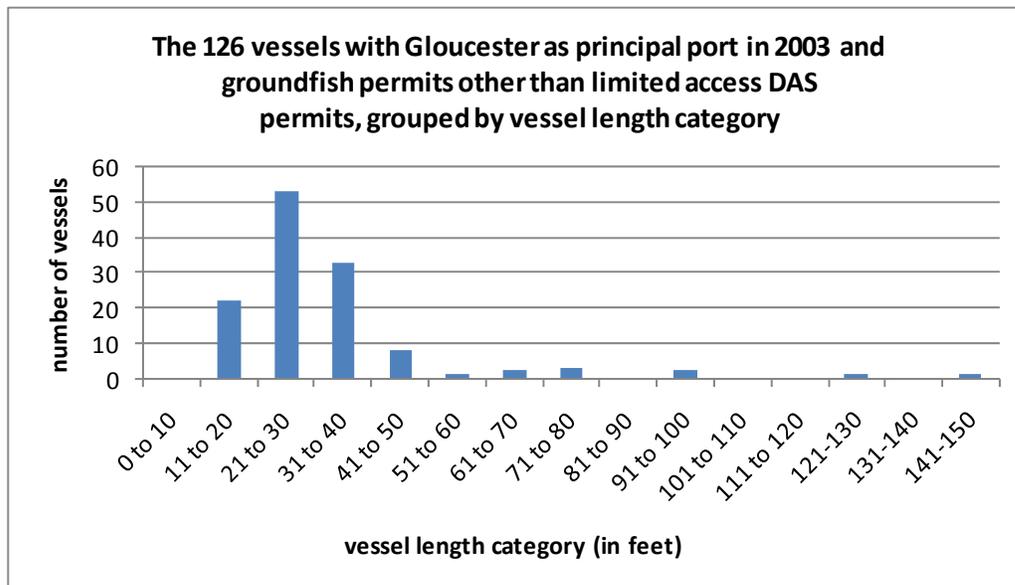
Vessel lengths of the 126 vessels with groundfish permits *other than* limited access DAS permits and Gloucester as principal port in 2003 (lengths in feet)

| | mean length | median length | minimum length | maximum length | range (max - min) |
|---|-------------|---------------|----------------|----------------|-------------------|
| all 126 vessels | 33 | 28 | 14 | 141 | 127 |
| all handgear permit vessels (114 total) | 32 | 26 | 14 | 141 | 127 |

The predominance of very small vessels in the group of 126 vessels with groundfish permits other than the limited access DAS permits can also be seen in the table and chart below. Sixty percent (60%) of the vessels are 30 feet or smaller, and 86% are 40 feet or smaller.

Vessel lengths for the 126 groundfish vessels with Gloucester as principal port in 2003 and with groundfish permits *other than* limited access DAS permits

| Length category (feet) | Number of vessels | Cumulative number of vessels | Percent of all vessels | Cumulative percent of all vessels |
|------------------------|-------------------|------------------------------|------------------------|-----------------------------------|
| 0 to 10 | 0 | 0 | 0% | 0% |
| 11 to 20 | 22 | 22 | 17% | 17% |
| 21 to 30 | 53 | 75 | 42% | 60% |
| 31 to 40 | 33 | 108 | 26% | 86% |
| 41 to 50 | 8 | 116 | 6% | 92% |
| 51 to 60 | 1 | 117 | 1% | 93% |
| 61 to 70 | 2 | 119 | 2% | 94% |
| 71 to 80 | 3 | 122 | 2% | 97% |
| 81 to 90 | 0 | 122 | 0% | 97% |
| 91 to 100 | 2 | 124 | 2% | 98% |
| 101 to 110 | 0 | 124 | 0% | 98% |
| 111 to 120 | 0 | 124 | 0% | 98% |
| 121-130 | 1 | 125 | 1% | 99% |
| 131-140 | 0 | 125 | 0% | 99% |
| 141-150 | 1 | 126 | 1% | 100% |



2. The Limited Access DAS Sample and the Handgear Sample

The decision to create two separate samples: It was decided, initially, that a single simple random sample would be created, comprised of owners of vessels with groundfish permits in any groundfish permit category, i.e, to create a simple random sample drawn from the 271 vessels on the Gloucester principal port list created for the study . After interviewing had begun, however, it was decided to create *two* simple random samples, one comprised solely of owners of vessels with limited access DAS permits (permit types A, B, D, E, F, G) and the other comprised solely of owners of vessels with handgear permits (permit type H). This decision resulted from the recognition that, either, two separate samples were necessary (one of limited access DAS vessels and one of handgear vessels), or, the mixed sample (of limited access DAS permits and handgear permits) would have to be significantly larger than originally planned. As shown above, the Gloucester principal port list was 54% limited access DAS vessels and 46% vessels with groundfish permits other than limited access DAS permits (90% of which, or 42% overall, were handgear permits). It was recognized that these two dominant sets of vessels on the principal port list – the limited access DAS vessels (145/ 271) and the handgear vessels (114/271) – were systematically different in multiple respects. Rather than trying to characterize the two sets of vessels through one, large sample, it was decided to create two separate samples to characterize the two sets of vessels.

It is important to note that, as indicated earlier, both sets of vessels were, technically, commercial vessels, in that both sets of permits (the limited access DAS permits and the handgear permits) allowed the sale of fish caught under the permit. Nonetheless, there were three systematic differences between the limited access DAS vessels and the handgear vessels, warranting their separation into separate samples. First, as described earlier, the two sets of vessels were subject to significantly different regulatory restrictions: The limited access DAS vessels could use bottom trawl, gillnets, longlines, and other gears; in addition, they had trip limits (where there were trip limits) substantially larger than the trip limits imposed on the handgear vessels (the exceptions were two of three yellowtail flounder stocks). That said, however, the limited access DAS vessels were required to use DAS to fish for groundfish, to stay out of year-round and seasonal closed areas (including “rolling closures” that roll down the inshore through the course of the year), to meet extensive and detailed gear specifications and restrictions, and to meet various other requirements. The handgear vessels, by contrast, were required to use handgear (rod and reel or handline) and were limited to 300 pounds of cod, haddock, and yellowtail flounder combined (and 200 pounds of cod and yellowtail flounder combined). Second, these regulatory differences were reflected in another difference between the two sets of vessels: their size. As shown above, the mean length of the limited access DAS vessels was 48 feet, while the mean length of the handgear vessels was 32 feet; 30% of the limited access DAS vessels were above 50 feet in length, whereas only 8% of the handgear vessels were above 50 feet in length. (See the tables in section 1 above.) Finally, third, the owners of the two sets of vessels had, arguably, systematically different histories in the groundfishery: To have owned a vessel with a limited access DAS groundfish permit in 2003, a vessel

(business) owner had either to have held a then-open-access groundfish permit in 1991 and to have had groundfish landings the year before (1/90-2/91) – the qualifying criteria for a limited access DAS permit when the limited access DAS permits were first created and allocated, in 1994 – or to have purchased or been transferred a limited access DAS permit (a complex process involving the purchase or receipt of a vessel with a limited access DAS permit) at some point after 1994 and before 2003.³⁷ By contrast, to have owned a vessel with a handgear permit in 2003, a vessel owner would simply have had to have applied for the then-open-access permit anytime before August 1, 2002.

Creating the two samples; response rates: Three successive draws were made, using computerized random sample generators, to create the two samples, the limited access DAS sample and the handgear sample. The first draw was from the principal port list, the list of 271 vessels that identified Gloucester as principal port and had a groundfish permit, in any groundfish permit category (permit types A, B, C, D, E, F, G, H, I, J, K), in 2003. The second and third draws were from the subset of 145 vessels that identified Gloucester as principal port and had a *limited access DAS* groundfish permit (permit types A, B, D, E, F, or G), in 2003.

Draw one (from the list of 271) was for 20 vessels; of the 20, 7 were vessels with limited access DAS permits (all 7 were type “B,” fleet DAS permits), and 13 were handgear permitted vessels (all 13 had H permits, and 4 of the 13 also had K permits). Of the 7 limited access DAS permitted vessels in draw one, the owners of all 7, or 100%, were interviewed. Of the 13 handgear permitted vessels in draw one, the owners of 7, or 54%, were interviewed. We did not make extensive efforts to interview the owners of the remaining 6 handgear vessels in draw one. Instead, we decided to separate the original sample into two separate samples – a limited access DAS sample and a handgear sample – and to put our efforts into expanding the limited access DAS sample.

Draw two (from the list of 145 limited access DAS permitted vessels) was for 8 vessels; of these, the owners of 6, or 75%, were interviewed; one owner was deceased (the vessel and permit had since passed to his grandson, who had not owned or operated the vessel in 2003), and one owner had left the fishing industry and did not respond to repeated interview requests over several weeks. Finally, draw three (also from the list of 145 limited access permitted vessels) was for 11 vessels; of these, 3 owners, or 27%, were interviewed. Of the remaining 8 vessels in draw three, one vessel owner (9%) declined the interview, and, for the 7 others, it was decided that efforts to pursue the interviews would not be continued as the sample of 16 owners of limited access DAS vessels garnered by that time was sufficient for analysis.³⁸

³⁷ See Amendment 5 to the Northeast Multispecies Fishery Management Plan, Final Rule, 59 FR 9872 (March 1, 1994).

³⁸ See the discussion of the interview process above.

Converting the sample of limited access DAS vessels into a sample of business owners owning limited access DAS vessels: As described in Part II above, once the two vessel samples were created (from the principal port list and the principal port sublist of 145 limited access DAS vessels), it was necessary to convert these vessel samples into, essentially, business samples. This was done as indicated, by identifying owners of the vessels, obtaining interviews with them, and, via the survey instrument that guided the interviews, asking them about all commercial fishing activities they had undertaken in the years inquired into, both on the vessel whose name had appeared in the vessel sample (and thereby drawn the owner into the business sample) and on any other vessels owned and/or fished by the owner.

As indicated, also, the study put a priority on investigating the limited access DAS sample: Additional vessels were drawn to expand the limited access DAS vessel sample; interviewing efforts focused on the owners of these vessels; and this write-up analyzes data from this sample.³⁹ What follows below is a description of the limited access DAS sample. This includes a description of the set of limited access DAS vessels owned by the owners in the limited access DAS sample, and a comparison of these limited access DAS vessels with the full set of limited access DAS vessels on the Gloucester principal port list (the 145 vessels with limited access DAS permits).

The limited access DAS sample: Sixteen limited access DAS vessel owners (i.e., 16 commercial groundfish business owners) were interviewed. It is not possible to determine the percentage of the total number of (unique) limited access DAS vessel owners (i.e., businesses) in Gloucester in 2003 that this sample of 16 represents. This is because, as was described in the methods section (Part II), we do not know the total number of limited access DAS vessel owners (i.e., businesses) operating out of Gloucester in 2003; we know only the total number of limited access DAS vessels operating out of Gloucester in 2003 (assuming we can use the limited access DAS vessels on the 2003 principal port list created for the study as this number, an assumption that carries the caveats discussed in Part II). That said, we can say with certainty that the vessel owner/business sample constitutes a sample of *at least* 11% of the limited access DAS vessel/business owners owning limited access DAS vessels with Gloucester as principal port in 2003: If we assume that each vessel on the list of 145 limited access DAS vessels represents a unique fishing business (an assumption we know to be too conservative, on the basis of this study itself), we can say (again, overly conservatively) that the sample of 16 limited access DAS vessel owners (businesses) constitutes a sample of 11% (16/145) of the owners (businesses).

As described in further detail in the discussion of the data obtained from the interviews of the limited access DAS vessel owners (in section 3 below), these 16 vessel (business) owners owned, in 2003, individually or jointly with others, 30 commercial fishing vessels. Twenty-nine (29) of these vessels were limited access DAS vessels, and all 29 had Gloucester as “principal port” in 2003. The data analyzed

³⁹ As indicated, the data from the interviews of the random sample of handgear vessel owners (a sample of 7 owners, some with multiple vessels) will be analyzed and presented at a later time.

below concerns, among other things, the operations of these 29 vessels in 2003. These 29 vessels comprise 20% of the limited access DAS vessels with Gloucester as principal port in 2003 (29/145).

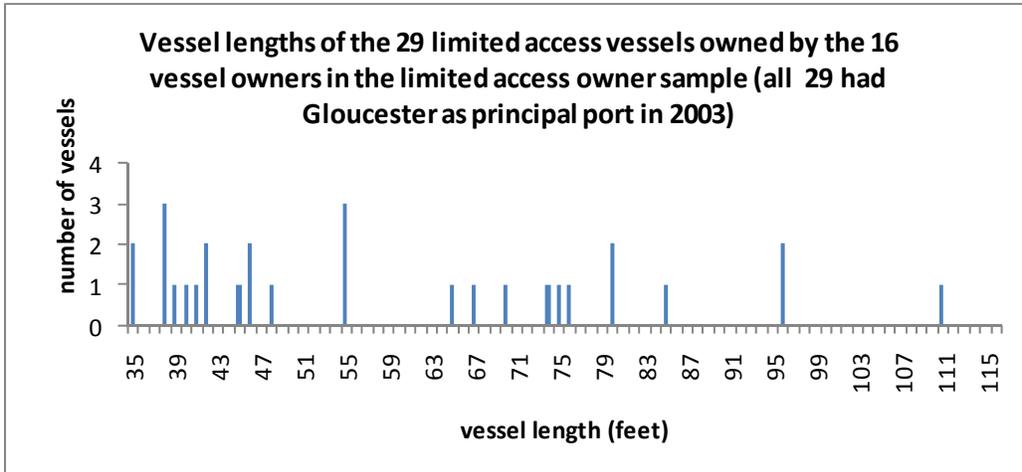
The limited access DAS permit types of the 29 limited access DAS vessels owned by the businesses in the sample, as well as the lengths of these 29 vessels, are presented below and compared with the limited access DAS permit types and vessel lengths of the full set of limited access DAS vessels on the Gloucester principal port list (i.e, the subset of 145 vessels with limited access DAS permits). As shown below, the 29 vessels owned by the business owners in the sample were larger, on average, than the full set of limited access DAS vessels on the principal port list (the sub list of 145 limited access DAS vessels), and had a greater percentage of type “A” individual DAS permits than the full set of limited access DAS vessels.

Permit types on the 29 limited access DAS vessels owned by the vessel (business) owners in the sample: The 29 limited access groundfish vessels owned by the vessel (business) owners in the sample (and with Gloucester as principal port) had the following limited access DAS permits: Seventeen percent (17%) had type A permits (5/16); 79% had type B permits (23/29), and 3% had type D permits (1/29). None had F or G permits (large mesh DAS).⁴⁰ The comparison with the permit types on the full set of limited access DAS vessels on the principal port list is as follows:

| LIMITED ACCESS VESSELS - PERMIT TYPES | | | | |
|--|----------------------------|--|---------------|---|
| limited access permit type | principal port list | | sample | |
| | number | % of all limited access permits on principal port list | number | % of all limited access permits in sample |
| A (individual DAS) | 16 | 11% | 5 | 17% |
| B (fleet DAS) | 112 | 77% | 23 | 79% |
| D (hook only DAS) | 12 | 8% | 1 | 3% |
| F or G (large mesh DAS) | 5 | 3% | 0 | 0% |
| <i>sum</i> | 145 | 100% | 29 | 100% |

Vessel lengths of the 29 limited access DAS vessels owned by the vessel (business) owners in the sample: The vessel lengths of the 29 limited access DAS vessels with Gloucester as principal port owned by the vessel (business) owners in the sample are shown below:

⁴⁰ As indicated earlier, there were no C or E permits on the Gloucester principal port list for 2003.



The mean of the vessel lengths of the 29 vessels was 59 feet, and the median 55. Both mean and median were larger than the mean and the median of the full set of 145 limited access DAS vessels on the Gloucester principal port list in 2003; the mean of the full set was 48, and the median of the full set was 42.

| LIMITED ACCESS VESSELS - VESSEL LENGTHS | | |
|--|--|--------------------------|
| | principal port list (n=145) | sample (n=29) |
| mean | 48 | 59 |
| quartile 1 | 38 | 41 |
| median | 42 | 55 |
| quartile 3 | 57 | 75 |
| minimum | 18 | 35 |
| maximum | 111 | 111 |
| range | 93 | 76 |

That there were, proportionally, more large vessels in the set of 29 limited access DAS vessels owned by the vessel (business) owners in the sample than there were in the full set of 145 limited access vessels on the principal port list is also seen below, in a comparison of vessel length distributions. As highlighted below, 70% of the vessels in the full set of 145 limited access vessels were 50 feet or smaller, while only 48% of the set of 29 vessels owned by the vessel owners in the sample were 50 feet or smaller. Hence, 30% of the vessels in the full set were over 50 feet, while 52% of the vessels in the set of 29 were over 50 feet.

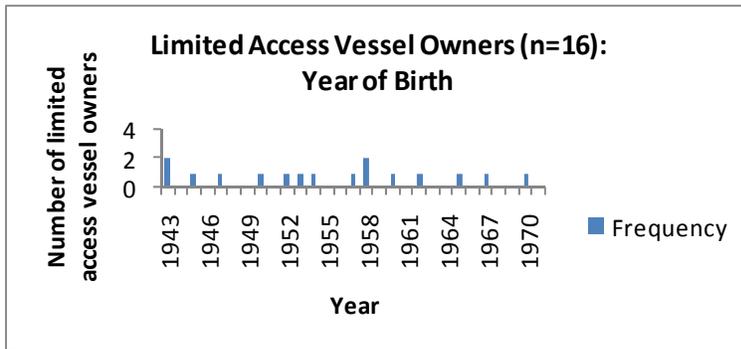
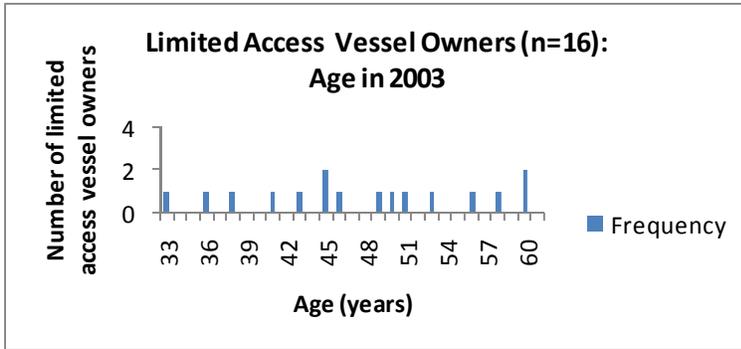
| ALL LIMITED ACCESS VESSELS ON 2003 GLOUCESTER PRINCIPAL PORT LIST | | | | ALL LIMITED ACCESS VESSELS IN SAMPLE | | | |
|---|-------------------|------------------------|--------------------|--------------------------------------|-------------------|------------------------|--------------------|
| Length (feet) | number of vessels | percent of all vessels | cumulative percent | Length (feet) | number of vessels | percent of all vessels | cumulative percent |
| 0 to 10 | 0 | 0% | 0% | 0 to 10 | 0 | 0% | 0% |
| 11 to 20 | 2 | 1% | 1% | 11 to 20 | 0 | 0% | 0% |
| 21 to 30 | 3 | 2% | 3% | 21 to 30 | 0 | 0% | 0% |
| 31 to 40 | 52 | 36% | 39% | 31 to 40 | 7 | 24% | 24% |
| 41 to 50 | 44 | 30% | 70% | 41 to 50 | 7 | 24% | 48% |
| 52 to 60 | 12 | 8% | 78% | 52 to 60 | 3 | 10% | 59% |
| 61 to 70 | 16 | 11% | 89% | 61 to 70 | 3 | 10% | 69% |
| 71 to 80 | 9 | 6% | 95% | 71 to 80 | 5 | 17% | 86% |
| 81 to 90 | 5 | 3% | 99% | 81 to 90 | 1 | 3% | 90% |
| 91 to 100 | 1 | 1% | 99% | 91 to 100 | 2 | 7% | 97% |
| 101 to 110 | 0 | 0% | 99% | 101 to 110 | 0 | 0% | 97% |
| 111 to 120 | 1 | 1% | 100% | 111 to 120 | 1 | 3% | 100% |
| | 145 | 100% | | | 29 | 100% | |

3. The Limited Access DAS Vessel (Business) Owner Sample Analyzed:

a. Personal characteristics of the limited access DAS vessel owners:

Gender of the limited access DAS vessel owners: One hundred percent (100%) of the limited access DAS vessel owners in the sample were male. However, as shown below, some owned their businesses and/or their vessels with their spouses.

Age in 2003 and year of birth: The limited access DAS vessel owners' ages in 2003 ranged from 33 (born in 1970) to 60 (born in 1943), a range of 27 years. The mean age was 48 (born in 1955). The median was also 48; the first quartile was 43 (born in 1960); and the third quartile was 54 (born in 1949). The ages of the limited access DAS vessel owners in the sample, and their years of birth, are shown below:



Place of birth: Approximately one-third (31%) of the 2003 limited access DAS vessel owners were born in Gloucester, and another near one-third (31%) were born within 31 driving miles of Gloucester, for a total of nearly two-thirds (62%) born in or within 31 driving miles of Gloucester. Another 13% were born in neighboring states in locales between 120 and 170 driving miles of Gloucester. Seventy-five percent (75%), therefore, were born in, or within 170 driving miles of, Gloucester. Twenty-five percent (25%) were born outside of the United States, in towns in Sicily, Italy (three near Palermo and one near Siracusa), about 4300 miles from Gloucester.

Place(s) of residence, 2003, 1993, 1983: Sixty-three percent (63%) of the 2003 limited access DAS vessel owners lived in Gloucester in 2003. Another 25% lived within 20 driving miles of Gloucester in 2003, for a total of 88% living in Gloucester or within 20 driving miles of Gloucester. Six percent (6%) lived within 70 driving miles of Gloucester in 2003, and another 6% lived within 120 driving miles of Gloucester in 2003.

Of the limited access DAS vessel owners living in Gloucester in 2003, all of them (100%) had also lived in Gloucester in 1993 and 1983. Of those living within 20 driving miles of Gloucester in 2003, 100% had also lived within 20 driving miles of Gloucester in 1993 and 1983 (one lived within Gloucester itself during 1983). The 6% living within 70 miles of Gloucester in 2003 had lived, in 1993 and 1983, within 20 driving miles of Gloucester, while the 6% living within 120 miles of Gloucester in 2003 lived within 120 miles of Gloucester in 1993 and 1983. Thus, in all, there was remarkable consistency in

place of residence in the three years inquired into in the study, three years that, as indicated, spanned a period of 21 years. For only one of the 16 in the sample (about 6%) was there an indication of a major change in place of residence (the shift from a locale within 20 driving miles of Gloucester to one within 70 miles of Gloucester). For all others, indications were that they either stayed in Gloucester, stayed within 20 driving miles of Gloucester, or, in the case of the single owner 120 miles from Gloucester, in that same locale 120 miles from Gloucester.

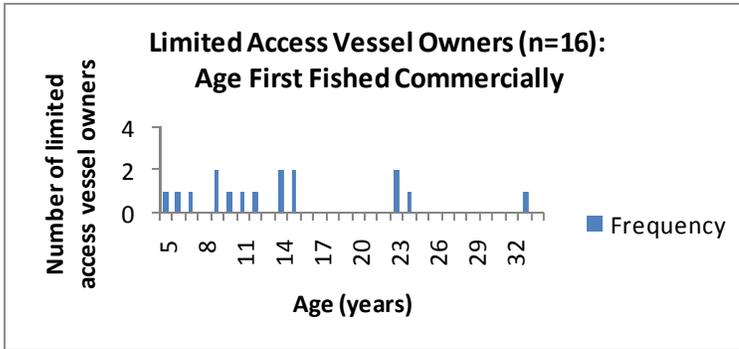
Finally, the limited access DAS vessel owners living in Gloucester in 2003 (and, as indicated, in 1993 and 1983) included among them *all* the limited access DAS vessel owners who were *born* in Gloucester. That is, the five 2003 limited access DAS vessel owners in the sample who were born in Gloucester also lived in Gloucester in 2003, 1993, and 1983; none had left (or if they had left, they had also returned).

Sicilian-Americans among the 2003 limited access DAS vessel owners: As indicated, 4/16, or 25%, of the 2003 limited access DAS vessel owners were born in Sicily. In addition, another 4/16, or 25%, had at least one parent or grandparent born in Sicily who had migrated to Gloucester. Thus, 50% of the limited access DAS vessel owners (8/16) were either first, second, or third generation Sicilian-Americans; “Sicilian-American” is defined here as someone living in the United States who either, was born in Sicily, or, had at least one parent or grandparent who migrated to the United States from Sicily.

All of the 2003 limited access DAS vessel owners who were second or third generation Sicilian-American were born in Gloucester, and lived in Gloucester in 1983, 1993, and 2003. In addition, all of the 2003 limited access DAS vessel owners who were first generation Sicilian-Americans (i.e., who were born in Sicily) also lived in Gloucester in 1983, 1993, and 2003. As such, then, none of the 2003 limited access DAS vessel owners who were first, second, or third generation Sicilian-Americans lived outside Gloucester in any of the years inquired into (2003, 1993, and 1983). Instead, all lived *inside* Gloucester in each of those years. Further, the Sicilian-Americans (first, second, and third generation) comprised a large majority of the 2003 limited access DAS vessel owners who were living in Gloucester in those years (80% in 2003 and 1993, and 73% in 1983).

b. Fishing careers of the limited access DAS vessel owners:

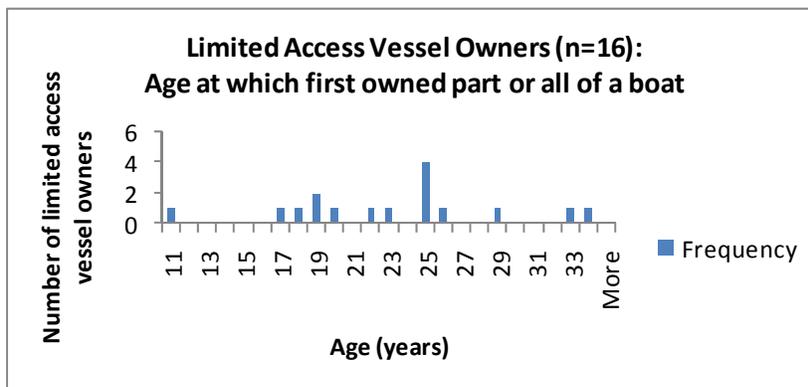
Age first fished: The youngest age at which a 2003 limited access DAS vessel owner first fished commercially was 5 years old (the question was interpreted by some as the age first *on* a commercial vessel); the oldest age at which a 2003 limited access DAS vessel owner first fished commercially was 33 years old. The mean was 14 years of age, and the median 13 years of age.



Fishermen in the preceding generation: Sixty-nine percent (69%, or 11/16) of the 2003 limited access DAS vessel owners were born into families in which at least one member of the preceding generation in the family (usually the father) was a commercial fisherman; 31% were not born into such families. Of the 69% born into families with a fisherman in the immediately preceding generation, some hailed from families of several generations of commercial fisherman (e.g., “since forever, that I know of”) and/or had multiple commercial fishermen in preceding generations of their families.

Learning fishing from family members: Sixty-three percent (63%, or 10/16) of the 2003 limited access DAS vessel owners learned commercial fishing from family members (fathers, uncles, and grandfathers). Notably, also, of the 37% that learned commercial fishing from non-family members, 33% (13% of the owners overall) learned from a “mentor” whom they analogized to a family member (e.g., “he was like a father to me”).

Age first owned a boat: The youngest age at which a 2003 limited access DAS vessel owner was either owner or part owner of a commercial fishing vessel was 11 years old; the oldest age at which a 2003 limited access DAS vessel owner first owned a commercial fishing vessel (or part of one) was 34 years old. The mean age was 23 years old, and the median was 24 years old; see below:



Careers in commercial fishing: Sixty-four percent (63.5%), or 10/16, of the 2003 limited access DAS vessel owners had, from the start of their commercial fishing careers, not worked for more than one year in any work outside of commercial fishing.

Thirty-eight percent (37.5%), or 6/16, of the 2003 limited access DAS vessel owners had worked, for one year or more, at work outside of commercial fishing since they had begun fishing. However, for 83% of these owners (5/6), or 31% of the owners overall, the work outside commercial fishing consisted of a brief hiatus in a fishing career: thus, one worked on commercial fishing vessels in summers during high school, worked as a carpenter for three years after high school, and then returned to commercial fishing; one worked in a gas station for one year between fisheries; one worked as a welder for a year after his vessel sank, then returned to fishing; one drove a truck for a year after he lost all his gear in a storm (producing the funds needed to replace the gear); and one rode out a dispute within his family's fishing business by working as a carpenter for a year, returning to fishing after building two houses. For one vessel owner (constituting 17% of the vessel owners working outside commercial fishing, or 6% of the owners overall), however, work outside of commercial fishing was not a hiatus in a commercial fishing career, but, rather, his mainstay. This vessel owner had owned and run three small businesses ashore, two of which were support industries for the commercial fishing industry (in 2003, he continued to own and run two of the three businesses). In addition to these shore-side businesses, however, he had (with others) owned and run a commercial vessel for a brief period in the 1980s; and, in 2003, he had re-entered the commercial fishing industry, becoming once again the owner of a commercial fishing vessel.

In addition to asking vessel owners whether they had worked for a year or more outside of commercial fishing since they had begun commercial fishing, the project also asked vessel owners whether they had owned or run any businesses other than commercial fishing businesses in any of the three years investigated in the study, 2003, 1993, or 1983. Thirty-one percent (31% or 5/16) did own some kind of enterprise outside of fishing while also owning and running a fishing business in at least one of the years asked about *or in a year close in time to one of the years asked about*. One was the vessel owner described above, who had owned and run three small businesses ashore, two of them fishing support businesses; for this vessel owner, the commercial fishing business was adjunct to his shoreside businesses. The second was a vessel owner who had integrated multiple marine businesses with his commercial fishing business; over the years, he had (together with family partners and others) businesses buying, refurbishing, and re-selling commercial vessels; delivering commercial vessels from one distant port to another (all through the Caribbean and as far south as Venezuela); and running and leasing vessels to carry small pelagics (herring and menhaden) from fishing vessels to processing sites, both onshore and offshore, along the New England coast. The third was a vessel owner who, together with others, had invested in buying and operating a piece of commercial real estate; for this vessel owner, the shoreside undertaking was strictly adjunct to his commercial fishing business. Fourth was a vessel owner who had started, with a family member, a seafood company, buying fish from vessels and selling fish to restaurants and other

small buyers; after a short time, he had turned over his interest in the business to his family member/ partner; for this vessel owner, too, this shoreside business was strictly adjunct to his commercial fishing business. Fifth was a vessel owner who had attempted day-trading while fishing (and operating his fishing business).

Most but not all of the limited access DAS vessel owners began their commercial fishing careers as crew on vessels owned by others (family members' vessels in some cases, non-family members' vessels in others); some, however, began their fishing careers captaining their own vessels.⁴¹ In 2003, one limited access DAS vessel owner in the sample combined captaining his own vessel with working as crew on another's vessel (a vessel owned by an owner not in the sample).

c. Business structures and practices in 2003:

Number of vessels owned in 2003: In 2003, the 16 limited access DAS vessel owners, among them, held ownership interests in 30 commercial fishing vessels. They held these interests either by themselves (i.e., individually) or with others (the patterns of individual and joint ownership are described below). Each limited access DAS vessel owner in the sample owned (individually or jointly) from one to four commercial fishing vessels in 2003. The median number of vessels held was 2, while the mean was 1.9. The distribution of the number of vessels owned (individually or jointly) per vessel owner is seen below:



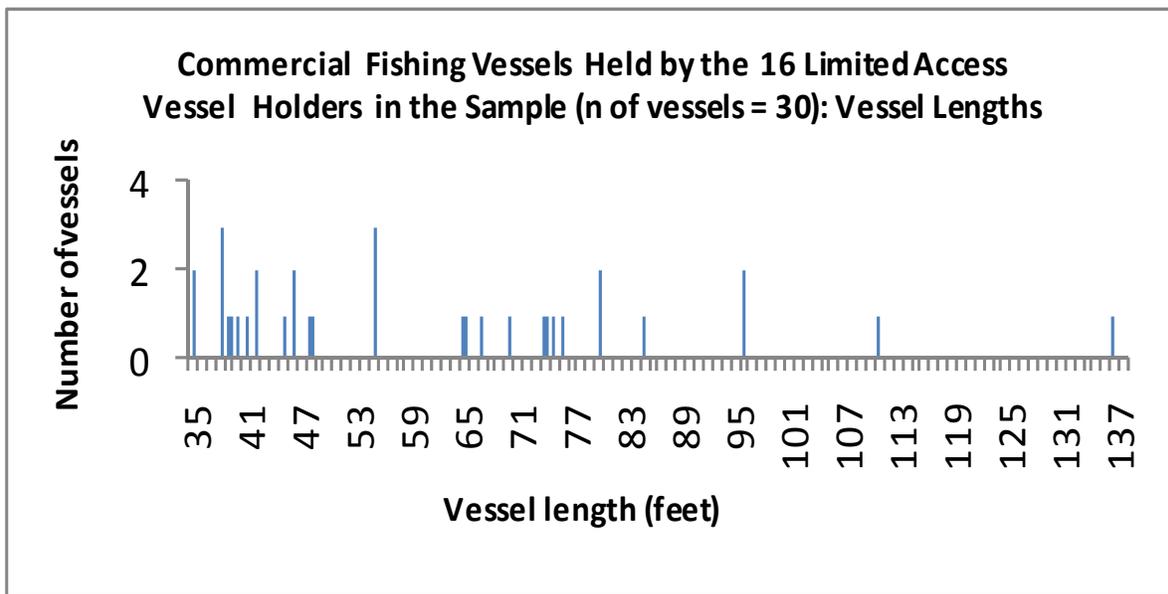
In examining these data, it is important to remember that some of the 30 vessels were owned individually and some jointly; therefore, the 16 limited access DAS vessel owners in the sample do not comprise the full set of owners of these 30 vessels. (Unfortunately, the data are insufficient to allow a determination of the full number of

⁴¹ More detailed analysis of these points will accompany the analysis of the 1983 and 1993 data.

owners of these 30 vessels; however, proportions of sole and joint ownership – and types of joint ownership – are described in analyses below.)

Groundfish permits on the vessels owned in 2003: As discussed in Part II, 29 of the 30 vessels owned by the limited access DAS vessel owners in 2003 had limited access DAS permits (and Gloucester as principal port). As indicated in Part II, the permit category breakdown of the limited access DAS permits on these 29 vessels was as follows: 17% had type A permits (5/16); 79% had type B permits (23/29), and 3% had type D permits (1/29).

Sizes of the vessels owned in 2003: The 30 vessels owned by the 16 limited access DAS vessel owners ranged in length from 35 feet to 137 feet, a range of 132 feet. The median was 55 feet; the first quartile was 41 feet, and the third quartile was 75 feet. The mean was 62 feet. The distribution of vessel lengths is displayed below.



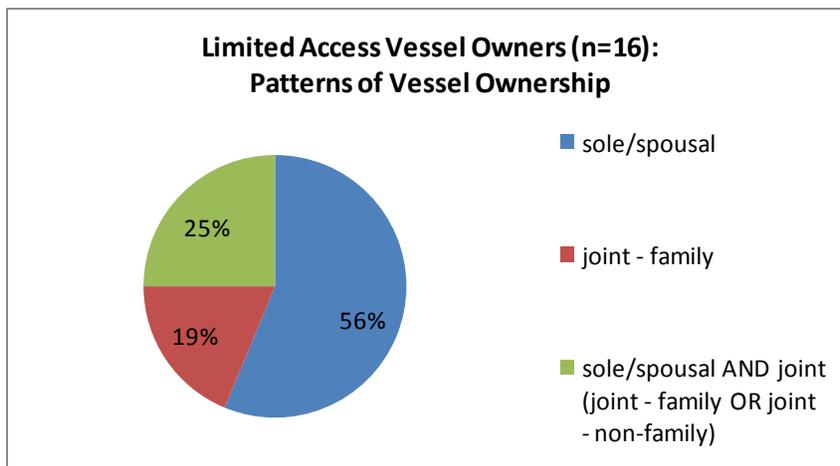
Patterns of vessel ownership in 2003: The limited access DAS vessel owners held their ownership interests either directly (by owning a vessel outright) or indirectly (by forming a business corporation to own the vessel and owning the shares in that business corporation). As indicated, vessel owners held these interests (in the vessel, or, if the vessel is owned by a corporation, in the vessel that owns the corporation) either individually or jointly.⁴² There were three patterns to joint ownership of vessels: (1) joint ownership by husband and wife; (2) joint ownership by business partners who were also family members; this pattern could include spouses *but was not limited to spouses* (typical cases include brothers or brothers-in-law); and (3) joint ownership by

⁴² Joint ownership usually entails the creation of a corporation to hold the vessel and the assignment of shares in the corporation to each of the joint owners.

business partners who are *not also family members* (this pattern could, however, also include spouses; what distinguishes it is that it includes non-family partners).

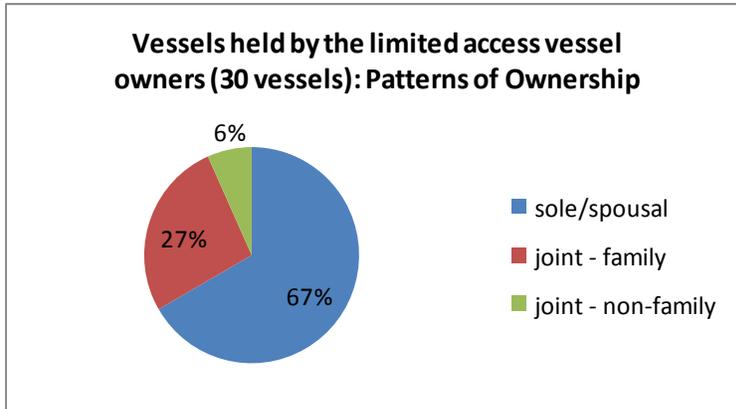
For the purpose of analyzing the distribution of ownership patterns among the 2003 limited access DAS vessel owners, sole ownership and spousal ownership were collapsed into one category (sole/spousal) and compared with joint ownership by family members (non-spousal family members, i.e., type 2 above) and joint ownership by non-family members (type 3 above).⁴³

Of the 16 limited access vessel holders in the sample, 56% (9/16) held their vessel(s) in sole or spousal ownership; 19% (3/16) held their vessel(s) in joint family ownership (type 2); and 25% (4/16) – all of whom held multiple vessels – held their vessels in a combination of sole/spousal and joint ownerships (joint family or joint non-family, types 2 and 3 above).



Of the 30 vessels owned by the 16 limited access DAS vessel owners in the limited access DAS vessel owner sample, two-thirds (66.7% or 20/30) were owned individually or by a pair of spouses (sole/spousal), 27% (8/30) were owned jointly by family members (type 2), and 6% (2/30) were owned jointly by non-family members (type 3).

⁴³ While further examination of the data to calculate the percentage of cases of spousal ownership would be worthwhile (as would calculation of the percentage of cases in which corporations were formed to own vessels), our interest here was in determining the percentages of sole/spousal ownership, joint family ownership (where family signifies non-spouse family members), and joint non-family ownership.

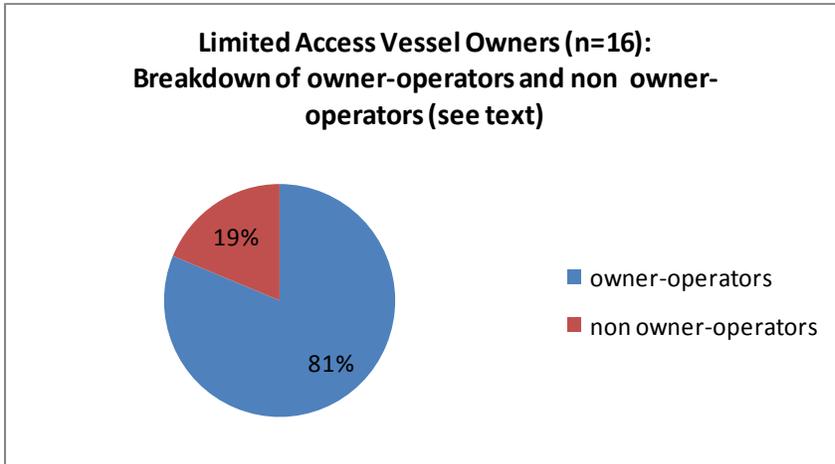


As previously indicated, the data collected do not, unfortunately, allow a determination of the total number of individual persons with ownership interests in the 30 vessels in which the 16 limited access DAS vessel owner had ownership interests. However, the data do indicate that: (a) as shown, two-thirds of the vessels (20/30) were individually owned (not counting spouses) and one-third of the vessels (10/30) were jointly owned (not counting spousal owners, i.e., in ownership types 2 and 3 above); (b) in the one-third of the vessels in joint ownership (types 2 and 3), the number of owners per vessel was small (approximately 2- 4 persons); and, finally, (c) some vessels jointly owned had the same joint owners as other vessels jointly owned (i.e., some limited access DAS vessel owners in the sample owned multiple vessels with the same group of co-owners). Finally, on another point, in only one case of joint ownership was one of the joint owners a silent-investor owner (this investor-owner was a partner of one of the 16 owners in the sample, and so was not in the sample).

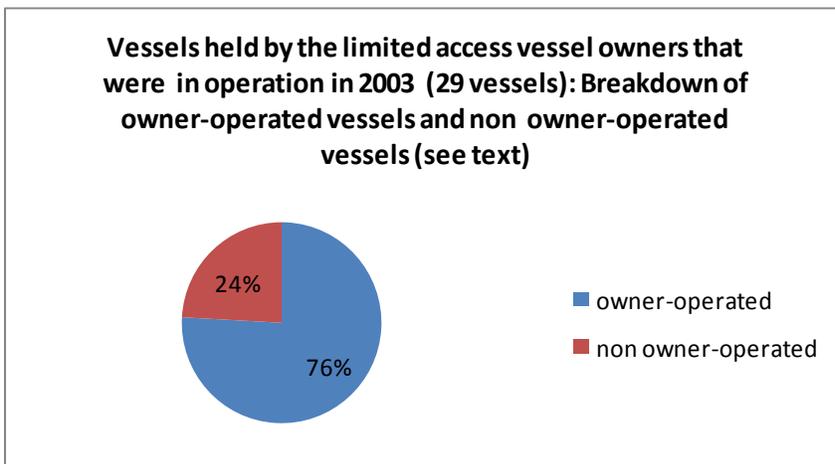
Owner-operators and non-owner-operators in 2003: All 16 of the limited access DAS vessel owners in the sample had vessels in operation in fishing year 2003; among them, they had 29 vessels in operation in 2003. (The one vessel not in operation in fishing year 2003 was owned by one of the vessel owners with multiple vessels; it was newly acquired by this owner at the end of fishing year 2003, and was not put into operation until fishing year 2004.) Eighty-one percent (81%, or 13/16) of the limited access DAS vessel owners were operating their own vessel, or, if they owned multiple vessels, operating *at least one of their own vessels* in 2003.⁴⁴ Nineteen percent (19%), or 3/16, did not operate their vessel, or if they owned multiple vessels, did not operate *any* of their vessels in 2003.

The 19% that did not operate any of their vessels used hired captains to operate their vessels; of this 19%, however, two-thirds (or 12.5% overall) hired captains who were family members (sons, cousins, nephews), while one-third (or 6% overall) hired captains who were not family members.

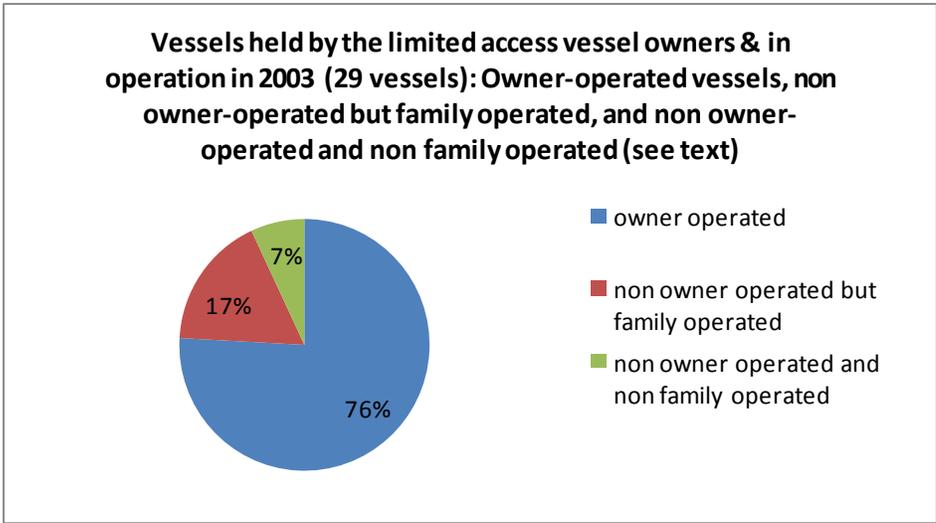
⁴⁴ Some vessel owners with multiple vessels operated *all* of their vessels, others operated one or more but not all of their vessels, and others operated none of their vessels. Vessel owners are counted as owner-operators if they operated at least one vessel at least some of the time.



Of the 29 vessels in operation in 2003, 22, or 76%, were owner-operated; this includes the vessels operated by the limited access DAS vessel owners in the sample as well as vessels not operated by the limited access DAS vessel owners in the sample but by other, co-owners of the vessels (i.e., for jointly owned vessels).

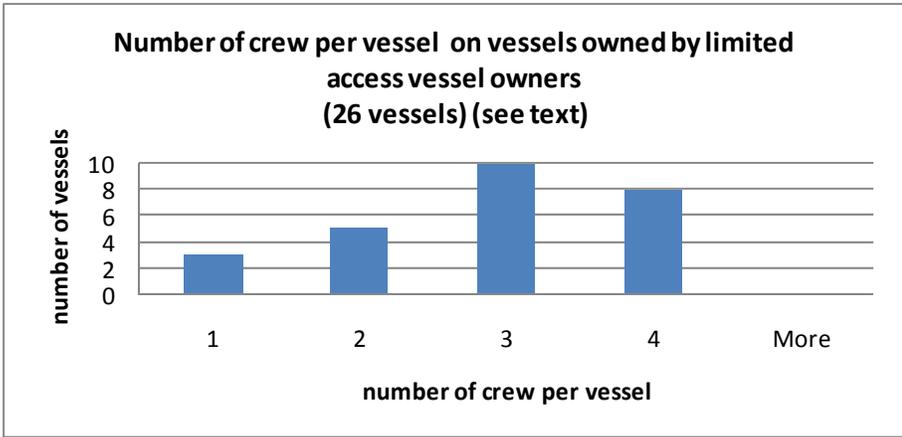


Of the 24% of vessels that were *not* owner-operated, however, almost three-quarters (71%), or 17% of the vessels overall, were captained (operated) by non-owners who were members of the owner's family (sons, nephews, cousins); slightly over a quarter (29%) of the vessels not owner-operated, or 7% of the vessels overall, were captained by non-owners who were *not* members of the owner's family. Thus, of the 29 vessels owned by the 16 limited access vessel members and in operation in 2003, only 7% (2 vessels) were captained by someone who was neither an owner of the vessel nor a member of the family of an owner of the vessel.

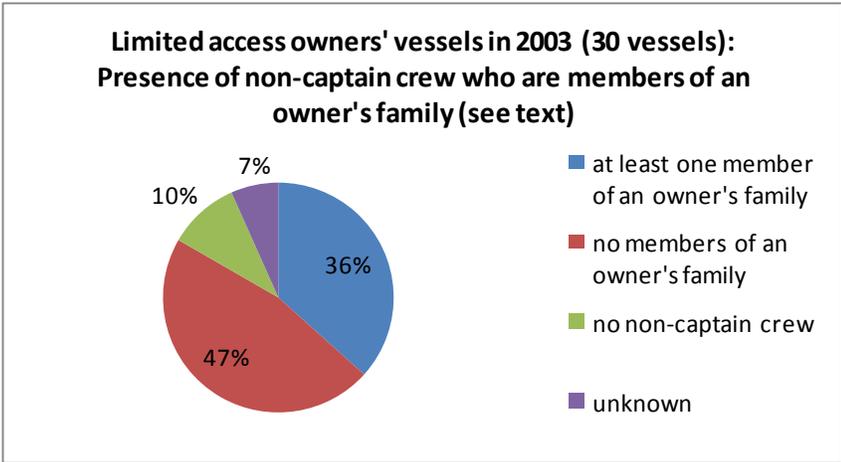


Finally, each of the vessel owners in the sample who did not operate their own vessels (both those who operated none of their own vessels and those who operated some but not all of their vessels) remained involved, from shore, in the operation of the vessels. Some were active shore captains, managing the vessel(s) and the business from shore; some had captained their vessel(s) in the past but had relinquished the captain’s chair (not, however, the ownership of the vessel) to a family member (e.g., a son); and some were busy captaining other vessels they owned while keeping an eye on the vessel they owned that was captained by another. Even the one vessel owner in the sample whose commercial fishing business was an adjunct to the shoreside businesses that he owned and ran (one of which was, notably, a shoreside support business for commercial fishing) – a vessel owner who was not an owner operator but one who hired captains – was involved in the operation of his vessel, both in the shoreside decisions required to run the vessel and, occasionally, on the vessel itself.

Number of crew per vessel in 2003: In 2003, the limited access DAS vessel owners operated their vessels with one to four crew members, including the captain; this calculation is based on 26 of the 30 vessels owned and/or fished by the limited access DAS vessel owners and in operation in 2003, as information was not available for the four other vessels in operation in 2003. The vessels for which the data were available were all vessels that targeted groundfish species (see the ‘species’ discussion below). The median was 3 crew members, and the mean 2.9 crew members. The distribution of the number of crew members per vessel is shown below:



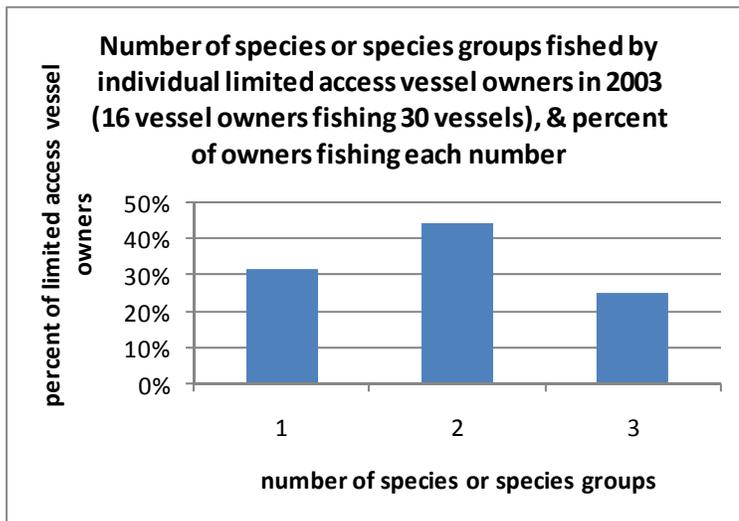
Non-captain crew members who are members of an owner's family: Thirty-six percent (36%) of the vessels had at least one non-captain crew member who was a member of the owner's family (a brother, son, father, uncle, brother-in-law, cousin, or godfather). Forty-seven percent (47%) had no non-captain crew who were members of the owner's family; 10% had no non-captain crew at all (they were fished by the captain alone); and for 7% of vessels (2 vessels) it was unclear whether non-captain crew included family members. Notably, of the vessels that had no non-captain crew who were family members of the owner, 14% (7% of the vessels overall) had as crew persons who were themselves members of a family (a father and a son, and previously also the father's brother), but not the owner's family.



d. Fishing and mobility practices in 2003

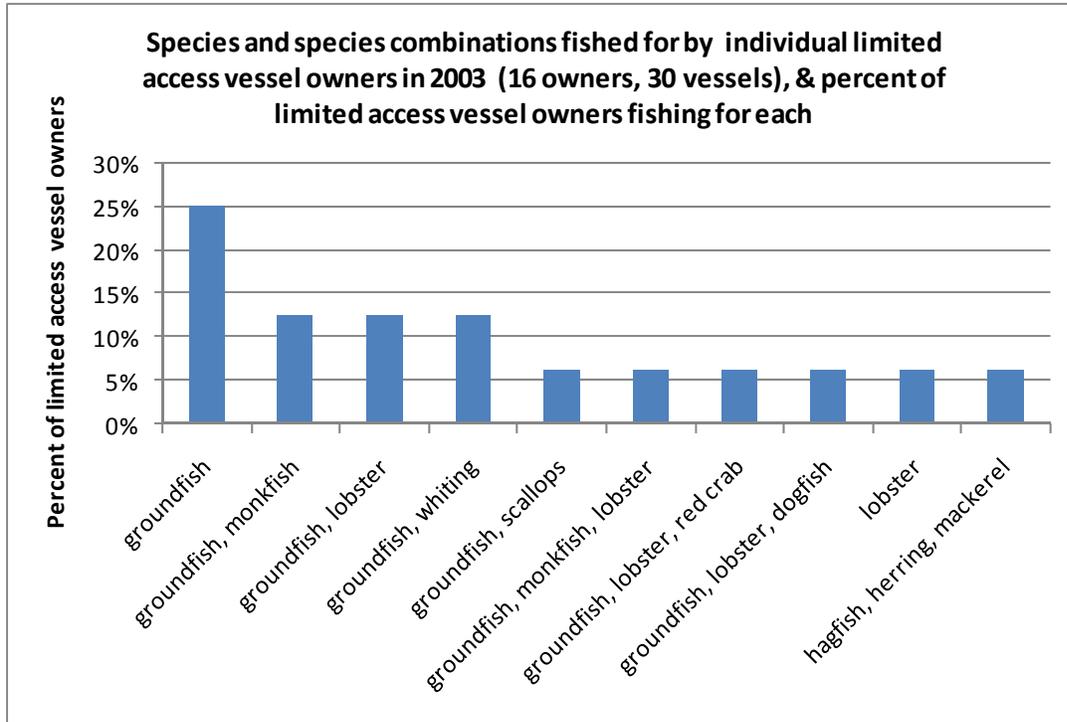
Fishing in 2003: All 16 limited access DAS vessel owners fished (or had others fish) their vessels in 2003. One vessel owner, who owned multiple vessels, did not fish one of his vessels in 2003 (as he newly acquired it in 2003). Hence, of the limited access DAS vessel owners' 30 vessels, 29 were fished in 2003. Further, one limited access DAS vessel owner in the sample fished, in addition to his own vessel, a vessel owned by another owner (not in the sample). Hence, the total number of vessels that the 16 limited access DAS vessel owners in the sample fished (or had others fish) in 2003 was 30. Of the 30 vessels fished in 2003, 28 had limited access DAS groundfish permits and two did not have groundfish permits at all. The two without groundfish permits were: (1) one of the vessels owned by one of the limited access DAS vessel owners in the sample, and (2) the vessel fished but not owned by one of the limited access DAS vessel owners in the sample.

Species fished for in 2003: In 2003, the 16 limited access DAS vessel owners, among them, fished for (i.e., targeted) 10 different species or species groups. These were: groundfish, lobster, monkfish, whiting, herring, mackerel, hagfish, red crab, dogfish, and scallop. Each limited access DAS vessel owner fished for 1-3 species or species groups in 2003: 31% fished for one species or species group, 44% fished for two species or species group, and 25% fished for three species or species groups. Note that these figures take into account *all* vessels owned and/or fished by each limited access DAS vessel owner; in some cases, an owner with multiple vessels fished each vessel for the same species or group of species while in others an owner fished different vessels for different species.

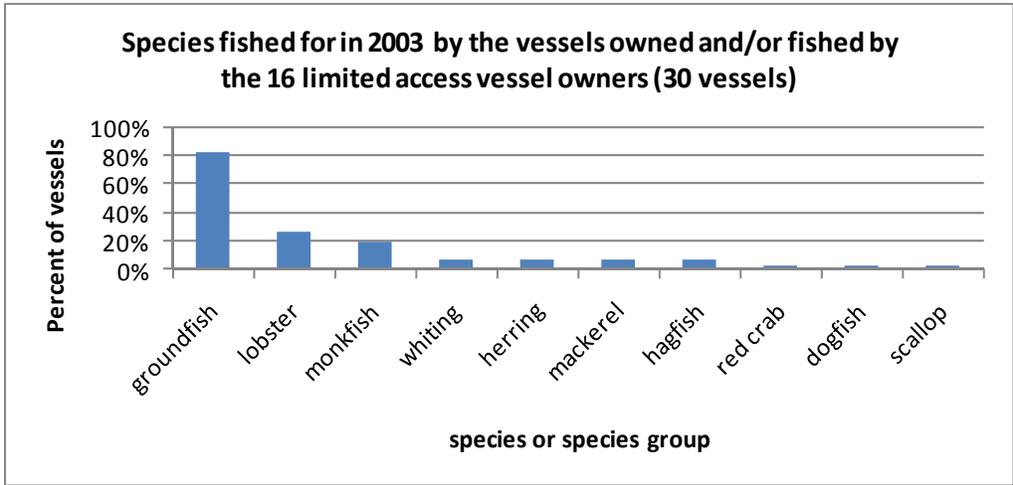


The limited access DAS vessel owners' individual strategies in 2003 – the species or species combinations for which each owner fished in 2003 – are shown below. As shown, not all the limited access DAS vessel owners were fishing for groundfish in 2003; 88% were fishing for groundfish, but 12% were not. The 12% not

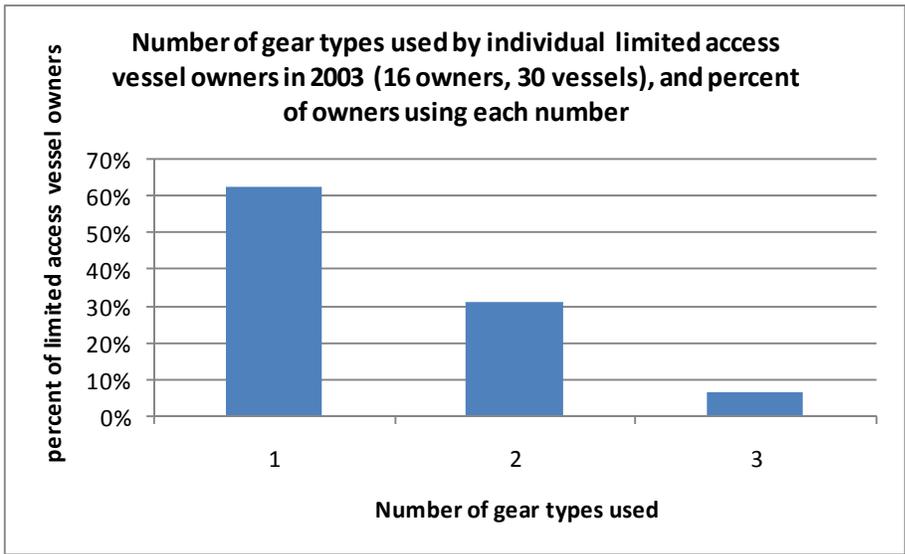
fishing for groundfish were fishing for lobster, or for hagfish, herring, and mackerel. Of the 88% fishing for groundfish, 28% (or 25% overall) were fishing *exclusively* for groundfish, while 71% (63% overall) were fishing for groundfish and one or two other species.



The following chart breaks down individual species and species groups caught by the limited access DAS vessel owners by the total numbers (expressed as percents) of owners' vessels (vessels owned or fished by the owners) catching the species. As shown, 83% of the owners' vessels fished for groundfish species, 27% for lobster, 20% for monkfish, 7% for whiting, 7% for herring, 7% for mackerel, 7% for hagfish, 3% for red crab, 3% for dogfish, and 3% for scallops. (As some vessels fished for multiple species –see above – the total sums to greater than 100%.)

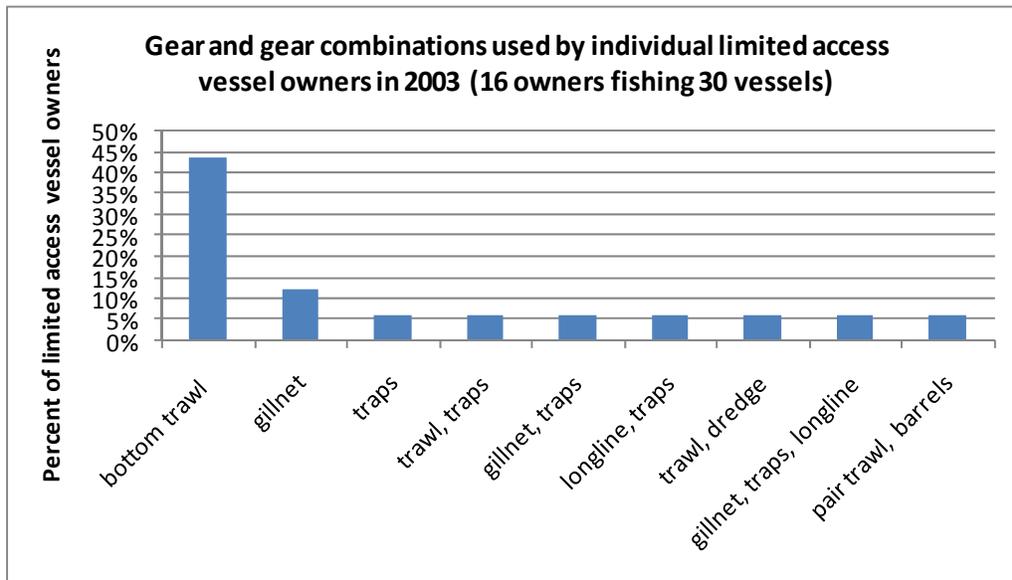


Gears used in 2003: The 16 limited access DAS vessel owners fishing in 2003 used, among them, seven gear types: bottom trawl, gillnet, traps, longline, pair trawl, barrels, and scallop dredge. Each limited access DAS vessel owner used 1-3 gear types in 2003. Sixty-three percent (63%) used just one gear type (across all vessels owned), 31% used two gear types (across all vessels owned), and 6% used three gear types (across all vessels owned). Note that owners using multiple gears either switched among gears on a single vessel (switching gear types as they switched target species) or used different gears on different vessels (using one vessel to target one species or species group and another vessel to target another species or species group).

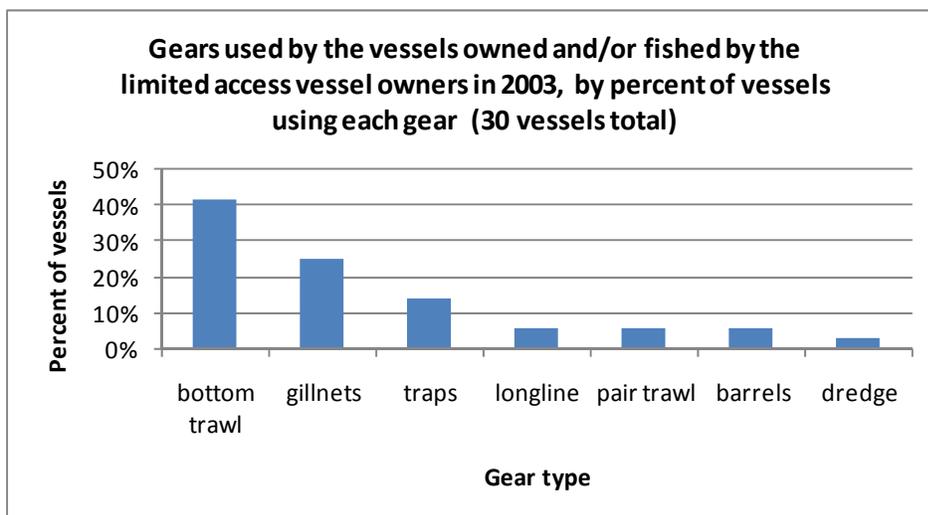


The gears or combinations of gears used by the individual limited access DAS vessel owners (across all vessels owned by an individual owner) are shown below. As shown there, 44% of the owners used bottom trawl gear exclusively, 13% of the owners

used gillnets exclusively, 6% used traps exclusively, and 38% used some combination of gears (32% combining two gear types and 6% combining three gear types).



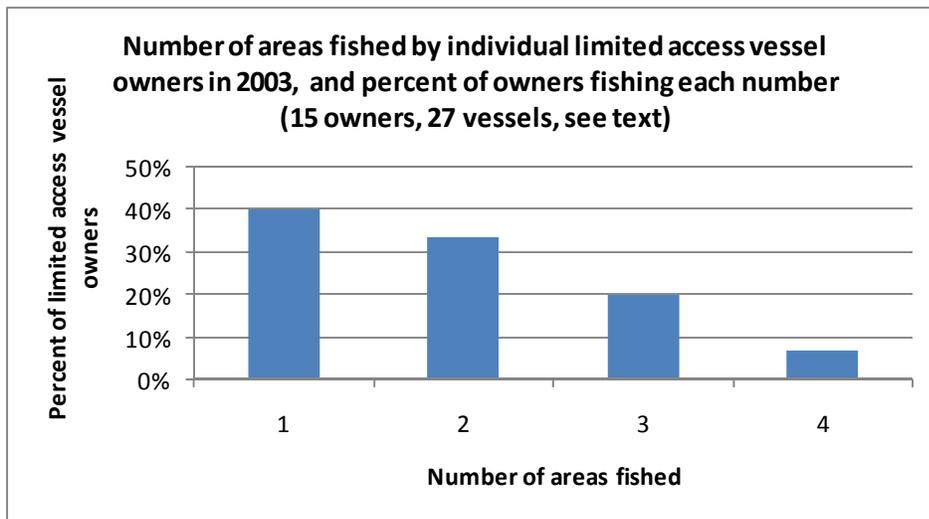
The following chart, finally, breaks down gear type by vessel rather than by vessel owner; it shows the numbers of vessels (expressed as percents of vessels) owned or fished by the owners fishing each gear type. (As some vessels used multiple gear types - see above, the percents total to greater than 100%). As shown, 42% of the vessels owned and/or fished by the owners used bottom trawl, 25% used gillnets, 14% used traps, 6% used pair trawls, 6% used barrels, and 3% used a dredge.



Areas fished in 2003: The limited access DAS vessel owners fished, in 2003, in five general areas of ocean. (This analysis is based on information from 15 of the 16 limited access DAS vessel owners, and from 27 of the 30 vessels they owned and/or fished.⁴⁵) The five general areas were:

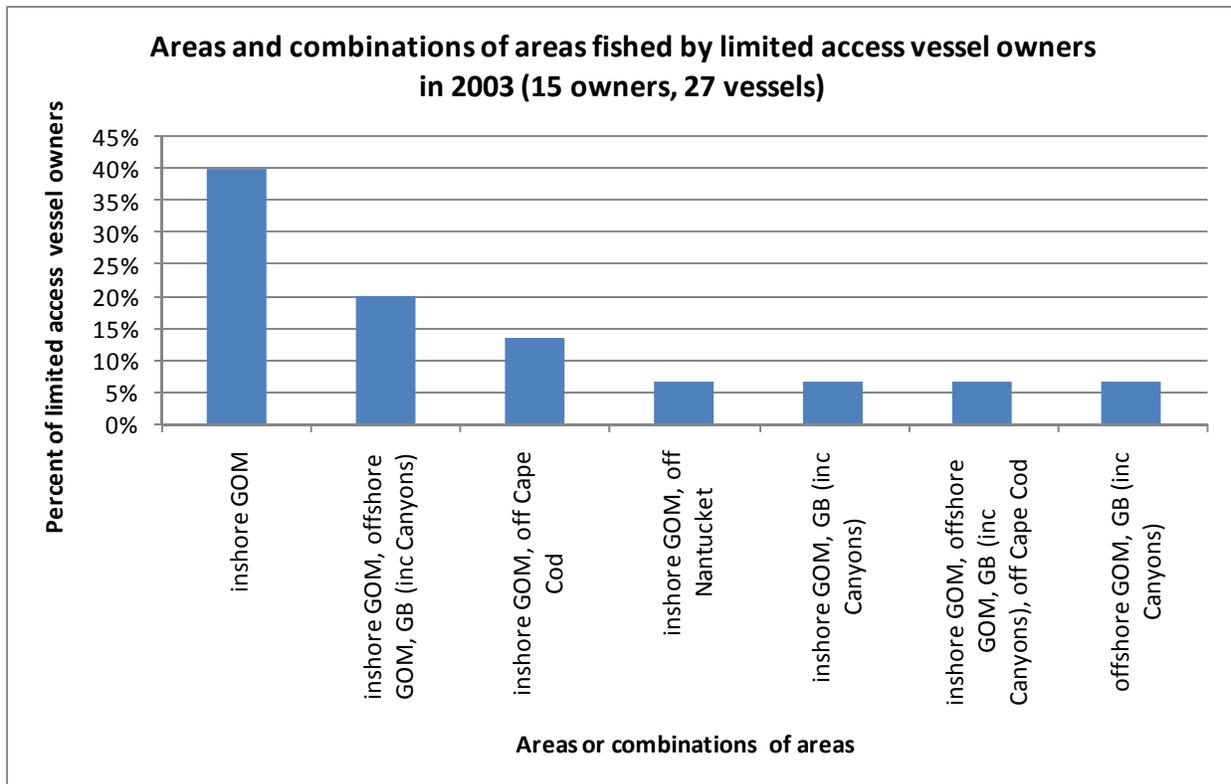
- inshore Gulf of Maine (GOM), including, but not limited to: Massachusetts Bay, Ipswich Bay, Stellwagen Bank, Jefferys Ledge;
- offshore Gulf of Maine (GOM), including, but not limited to: Cashes Ledge, Jeffreys Bank, Platts Bank, Fippennies Ledge, Wilkinson Basin, and Rodgers Swell;
- on and around Georges Bank (GB), including, but not limited to, Franklin Basin, the Southeast Parts, Cultivator Shoals, and the Canyons;
- off Cape Cod (“the Outer Cape”); and
- off Nantucket.

Each individual owner fished, across all vessels owned and/or fished, 1-4 areas in 2003. Owners with multiple vessels fishing in multiple areas fished either each vessel in each area or different vessels in different areas. As shown below, 40% of the owners fished in just one area, 33% of the owners fished in two areas, 20% of the owners fished in three areas, and 7% of the owners fished in four areas.

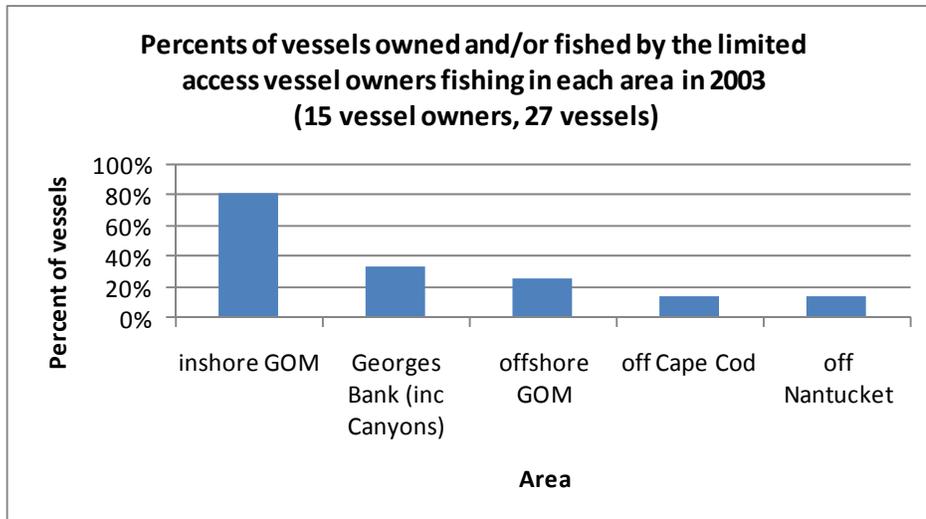


⁴⁵ Information about areas fished in 2003 was lacking for one of the 16 vessel owners (a vessel owner who fished two vessels in 2003) and it was also lacking for one of two vessels fished by another vessel owner.

The areas or combinations of areas fished by individual limited access DAS vessel owners are shown below. As shown, 40% of the limited access DAS vessel owners fished exclusively in the inshore Gulf of Maine; 20% fished in the inshore Gulf of Maine and either off Cape Cod or off Nantucket (13% off Cape Cod and 7% off Nantucket); 20% fished in the inshore Gulf of Maine, the offshore Gulf of Maine, and Georges Bank (including the Canyons); 14% fished either inshore or offshore in the Gulf of Maine and on and around Georges Bank (including the Canyons) (7% in the inshore GOM and 7% in the offshore GOM); and 7% fished inshore and offshore in the Gulf of Maine, on and around Georges Bank (including the Canyons), and off Cape Cod.



Finally, the following chart breaks down areas fished by the number of vessels (expressed as percent of vessels) fishing in each area in 2003. This analysis of areas is not, like the two above, by vessel owner (i.e., fishing business) but by vessel. It shows the numbers (as percents) of the owners' vessels (vessels owned and/or fished by the owners) fishing in each area. As some owners' vessels fished in multiple areas in 2003, the percents do not sum to 100%. As shown below, 81% of the vessels fished in the inshore Gulf of Maine, 33% of the vessels fished on or around Georges Bank (including the Canyons), 26% of the vessels fished offshore in the Gulf of Maine, 15% of the vessels fished off Cape Cod, and 15% of the vessels fished off Nantucket.



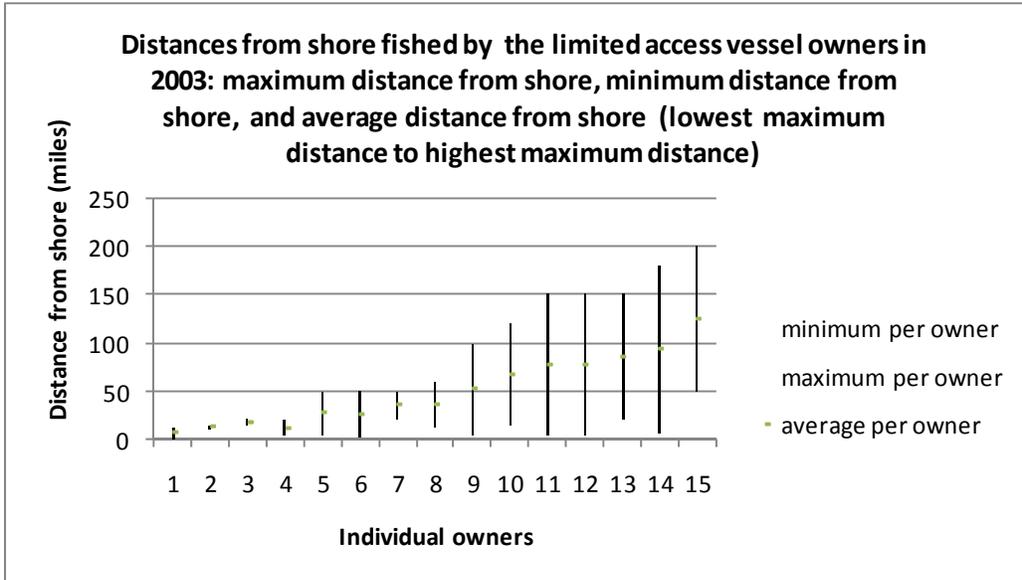
Distances from shore in 2003: Individual limited access DAS vessel owners fished from 0 – 200 miles from shore in 2003. (This analysis is based on information from 15 of the 16 limited access DAS vessel owners, and from 27 of the 30 vessels they owned and/or fished.⁴⁶) The mean of the individual owners' *minimum* distances from shore was 11 miles from shore, while the median of the minimum distances was 6 miles from shore. The mean of the individual owners' *maximum* distances from shore was 89 miles from shore, while the median of the maximum distances was 60 miles from shore. The mean of their ranges (maximum distances minus minimum distances) was 77 miles, while the median was 48 miles. Note that these figures take into account *all* vessels owned and/or fished by each limited access DAS vessel owner; owners with multiple vessels either fished their multiple vessels the same maximum and minimum distances from shore, or fished different vessels different minimum and maximum distances from shore. The figures are summarized below:

Limited access DAS vessel owners' Distances from Shore in 2003 (miles)

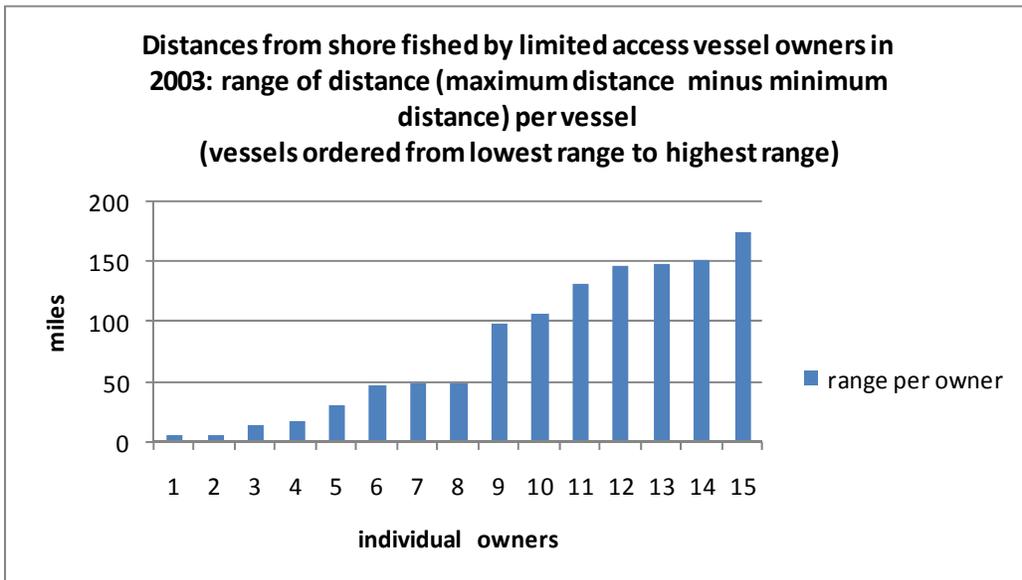
| | minimum distance from shore | maximum distance from shore | range (maximum distance minus minimum distance) |
|---------|-----------------------------|-----------------------------|---|
| mean | 11 | 89 | 77 |
| median | 6 | 60 | 48 |
| range | 50 | 187 | 169 |
| minimum | 0 | 13 | 5 |
| maximum | 50 | 200 | 174 |

⁴⁶ Information about distances from shore in 2003 was lacking for one of the 16 vessel owners (a vessel owner who fished two vessels in 2003) and it was also lacking for one of two vessels fished by another vessel owner.

The owners' individual minimums and maximums (and averages) are indicated below:



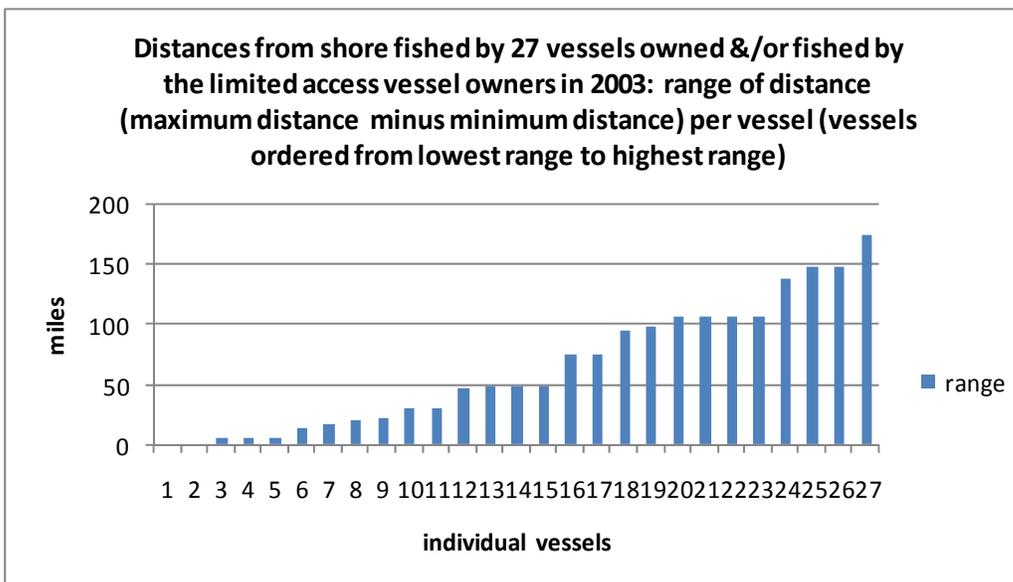
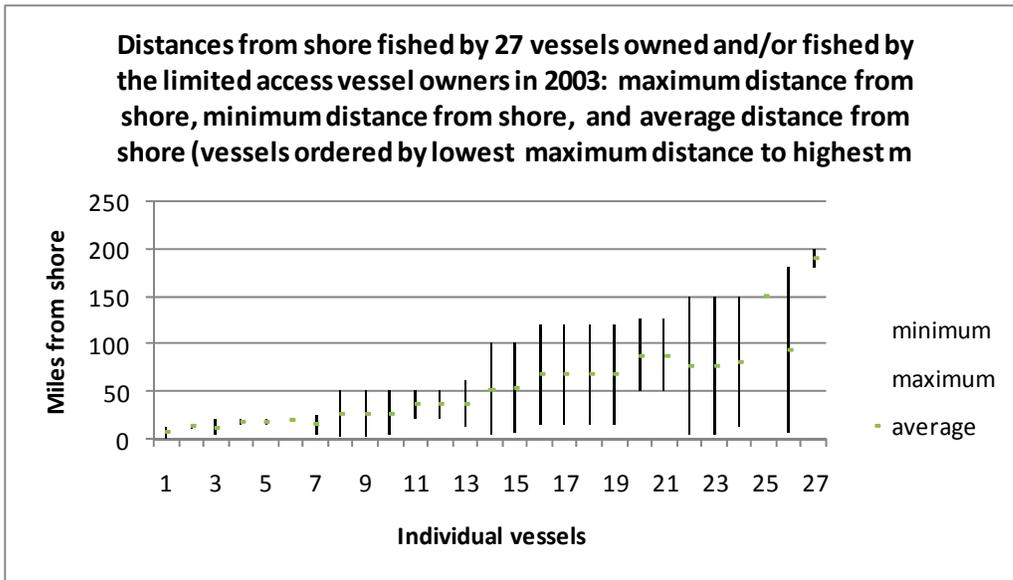
The owners' ranges (maximum distances minus minimum distances) are indicated below:



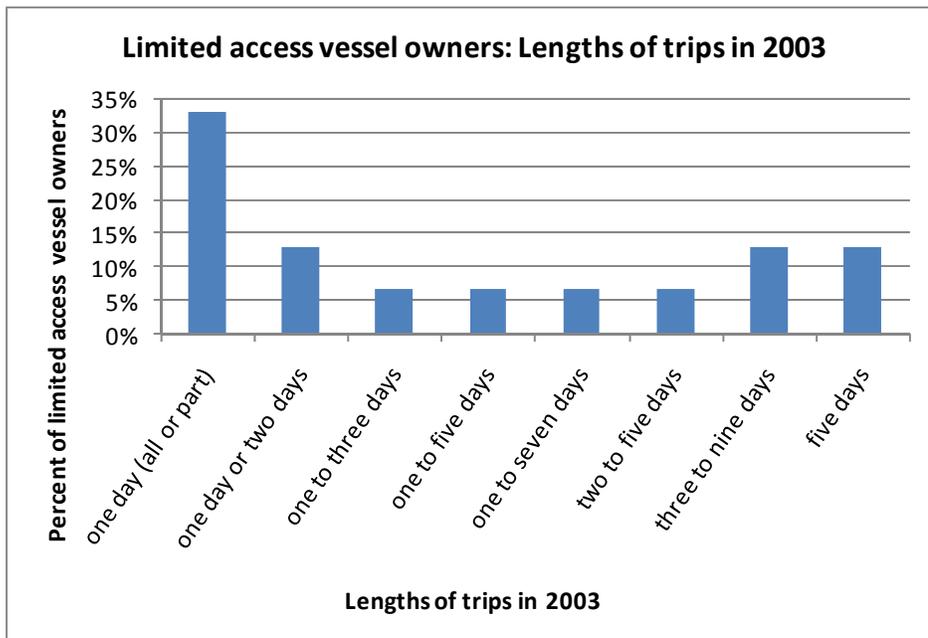
The following tables and charts analyze distances from shore fished by individual vessels rather than, as above, by individual vessel owners:

Limited Access Owners' VESSELS' Distances from Shore in 2003 (miles)

| | minimum distance from shore | maximum distance from shore | range (maximum distance minus minimum distance) |
|---------|-----------------------------|-----------------------------|---|
| mean | 24 | 87 | 63 |
| median | 12 | 100 | 48 |
| range | 180 | 187 | 174 |
| minimum | 0 | 13 | 0 |
| maximum | 180 | 200 | 174 |



Trip lengths in 2003: The limited access DAS vessel owners' fishing trips varied in length from one day (or part of one day) to nine days in 2003. (This analysis is based on information from 15 of the 16 limited access DAS vessel owners, and from 27 of the 30 vessels they owned and/or fished.⁴⁷) One-third (33%) of the owners took exclusively day trips (part or all of a single day) in 2003; 13% took trips that were either one or two days; and 7% took trips that ranged in length from one day to three days; hence, 53% of the owners took trips ranging from one day (or part of a day) to three days in 2003. Thirty-four percent (34%) of the owners varied widely in the lengths of the trips taken by their vessels (vessels they fished and/or owned): 7% took trips anywhere from one to five days long; 7% took trips anywhere from one to seven days long; 7% took trips from two to five days long; and 13% took trips from three days long to nine days long. Finally, the remaining 13% took trips that were five days long.

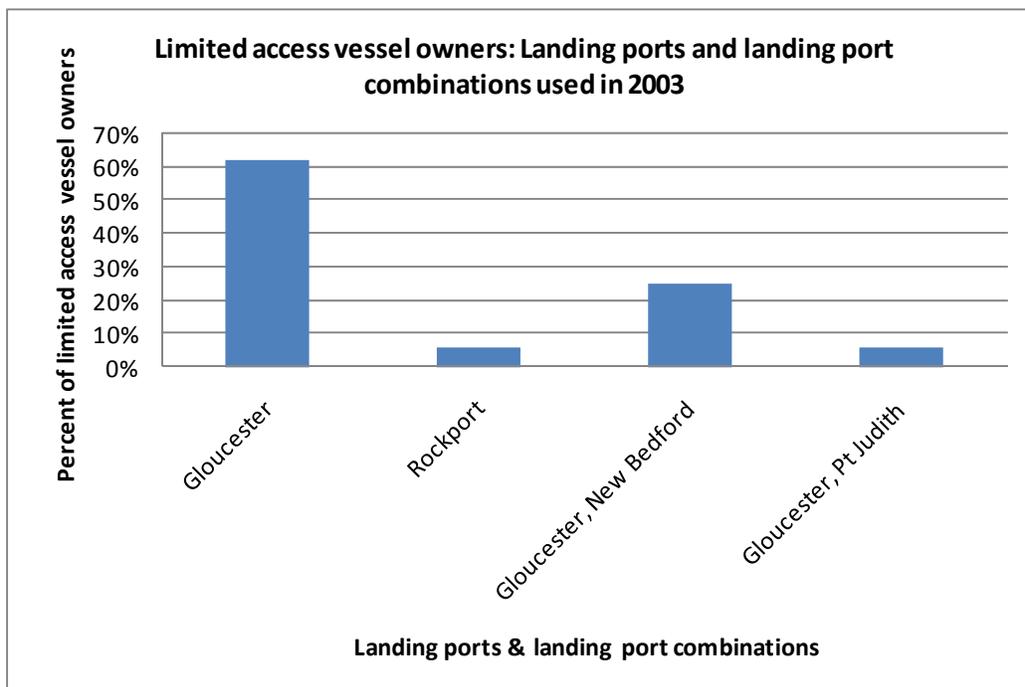


As with other owner by owner analyses above, this owner trip length analysis takes into account *all* vessels owned and/or fished by each limited access DAS vessel owner. Owners with multiple vessels either fished their multiple vessels for the same lengths of time (or same ranges of lengths) or fished different vessels different lengths (or ranges of lengths) of time.

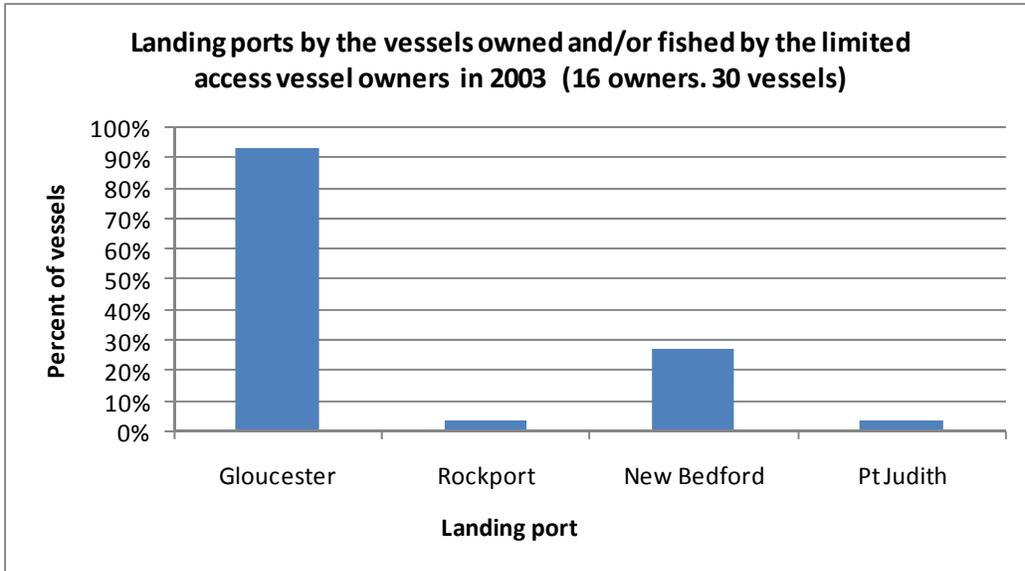
⁴⁷ Information about distances from shore in 2003 was lacking for one of the 16 vessel owners (a vessel owner who fished two vessels in 2003) and it was also lacking for one of two vessels fished by another vessel owner.

Ports used in 2003: The limited access DAS vessel owners were asked about the ports they used in 2003 to: (1) land fish (where fish is unloaded from the vessel), (2) sell fish (where the first ex-vessel sale takes place), and (3) tie up their vessels.

Landing ports: The 16 limited access DAS vessel owners in the sample used, among them, four different landing ports in 2003: Gloucester, Rockport (MA); New Bedford (MA), and Pt Judith (RI). Sixty-nine percent (69%) of the owners used one landing port exclusively in 2003, while 39% used two landing ports in 2003. The ports and port combinations used by the limited access owners are indicated below. As shown, 63% landed their fish exclusively in Gloucester in 2003, and 6% landed their fish exclusively in Rockport, MA (located, with Gloucester, on Cape Ann, Massachusetts); these owners, together, comprised the 69% whose vessels (those they owned and/or fished) landed fish exclusively in one port in 2003. The remaining 31% landed fish in two ports in 2003: 25% landed fish in Gloucester and New Bedford, and 6% landed fish in Gloucester and Pt Judith. Owners with multiple vessels using two ports landed their multiple vessels in the same two ports or landed different vessels in different ports.



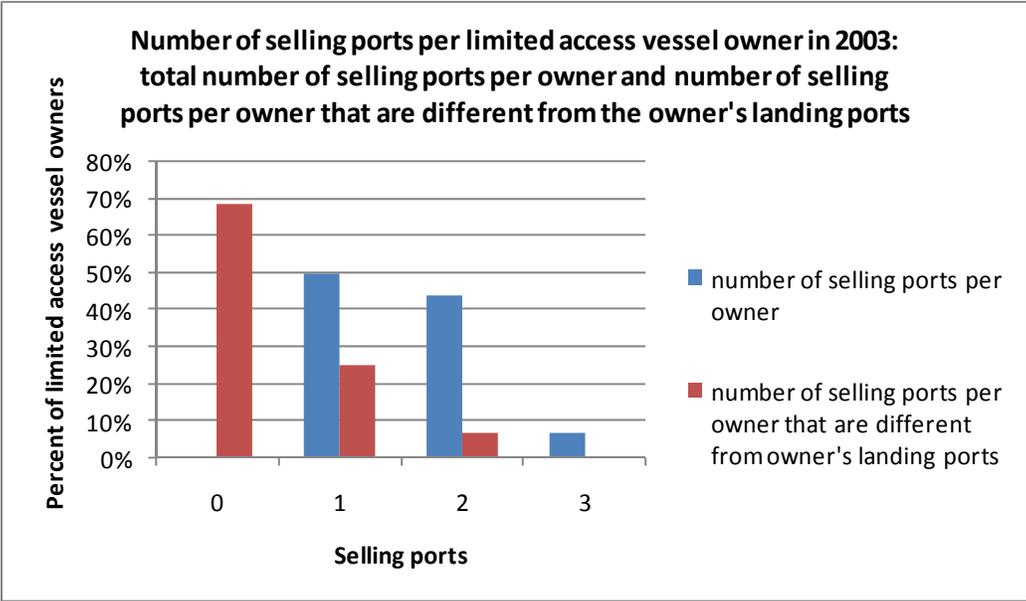
The following chart examines landing port use by vessel rather than by owner: It shows that 93% of the vessels owned and/or fished by the limited access DAS vessel owners landed fish in Gloucester, 25% landed fish in New Bedford, 6% landed fish in Rockport, and 6% landed fish in Pt Judith. (As some vessels landed fish in more than one port, the percents sum to greater than 100%.)



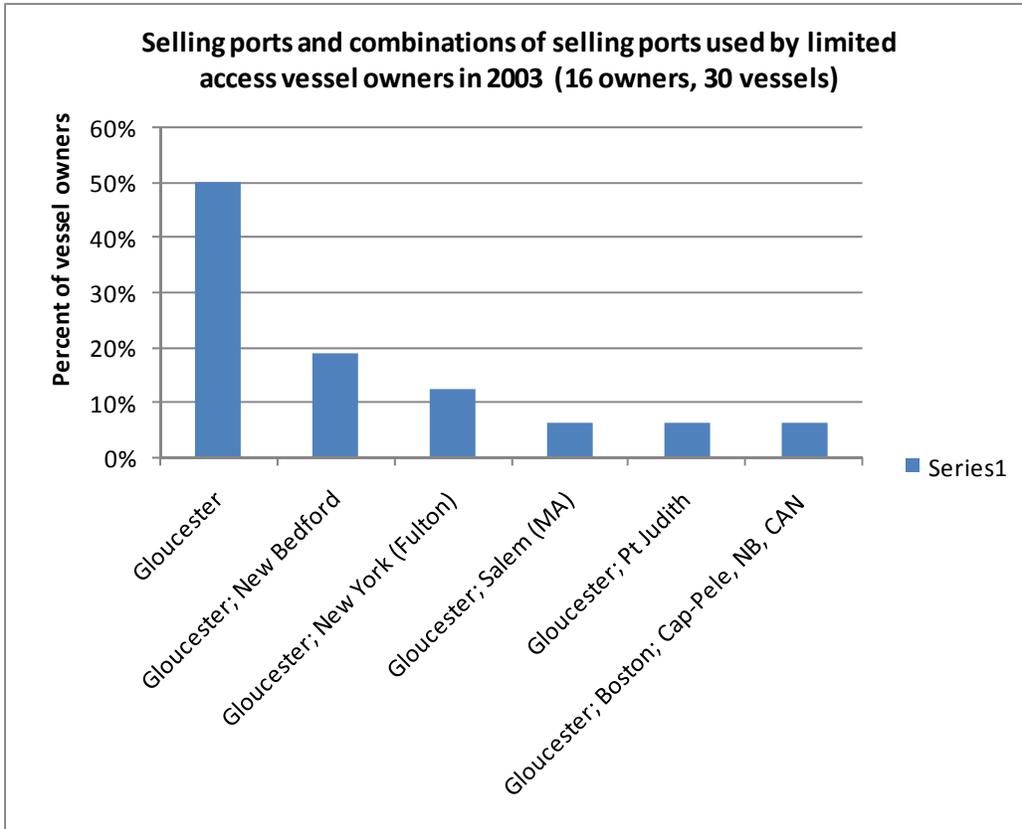
Selling ports: The 16 limited access DAS vessel owners used, among them, seven different selling ports in 2003. Selling ports were defined as ports in which the first ex-vessel sale of the fish is made; selling ports may be – and often are – the same as landing ports, but, in some cases, they differ. In cases in which selling ports do differ from landing ports, fish is trucked from landing port to selling port. Trucking arrangements take a variety of forms; in some cases, the seller (the vessel owner/ fishing business) arranges for – and pays for – the trucking, while in others the buyer (the fish dealer) arranges for – and pays for – the trucking.

The seven selling ports used in 2003 included three of the four landing ports, and four ports (or locales) not used as landing ports. The three selling ports that were also landing ports were: Gloucester, New Bedford, and Pt Judith. The four selling ports that were *not* also landing ports were: Boston, New York (Fulton Fish Market), Salem (MA), and Cap-Pele, New Brunswick, Canada.

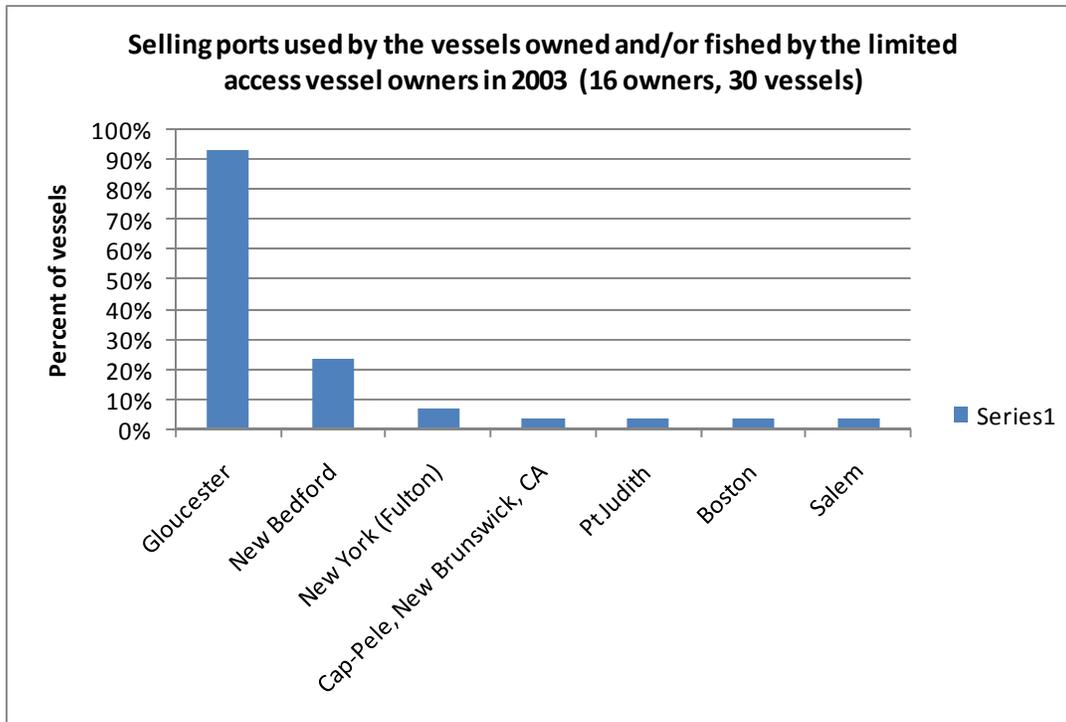
Individual limited access DAS vessel owners used one to three selling ports in 2003. Fifty percent (50%) used just one selling port; 44% used two selling ports; and 6% used three selling ports. Sixty-nine percent (69%) of the owners used selling ports that were the same as their landing port(s), while 31% used at least one selling port different from their landing port(s) (25% used one selling port that was different from their landing port(s), and 6% used two selling ports that were different from their landing port(s)). The 31% of owners using selling ports different from landing ports used, as indicated: Boston, New York (Fulton Fish Market), Salem (MA), and Cap-Pele, New Brunswick, Canada. The number of selling ports per owner, and the number of selling ports per owner that were different from the owner’s landing ports, are indicated below:



As in the other owner analyses, the owner selling port analyses take into account all vessels owned and/or fished by individual owners in 2003. Owners with multiple vessels used the same selling ports for their multiple vessels or different selling ports for different vessels. The selling ports and combinations of selling ports used by individual owners for their vessel(s) in 2003 are shown below: As shown, 50% of the owners used Gloucester, exclusively, as their selling port in 2003 (these are the same 50% who used only one selling port in 2003). Nineteen percent (19%) used Gloucester and New Bedford; 13% used Gloucester and New York (Fulton Fish Market); 6% used Gloucester and Salem (MA); 6% used Gloucester and Pt Judith (RI); and 6% used Gloucester, Boston, and Cap-Pele, New Brunswick, Canada.



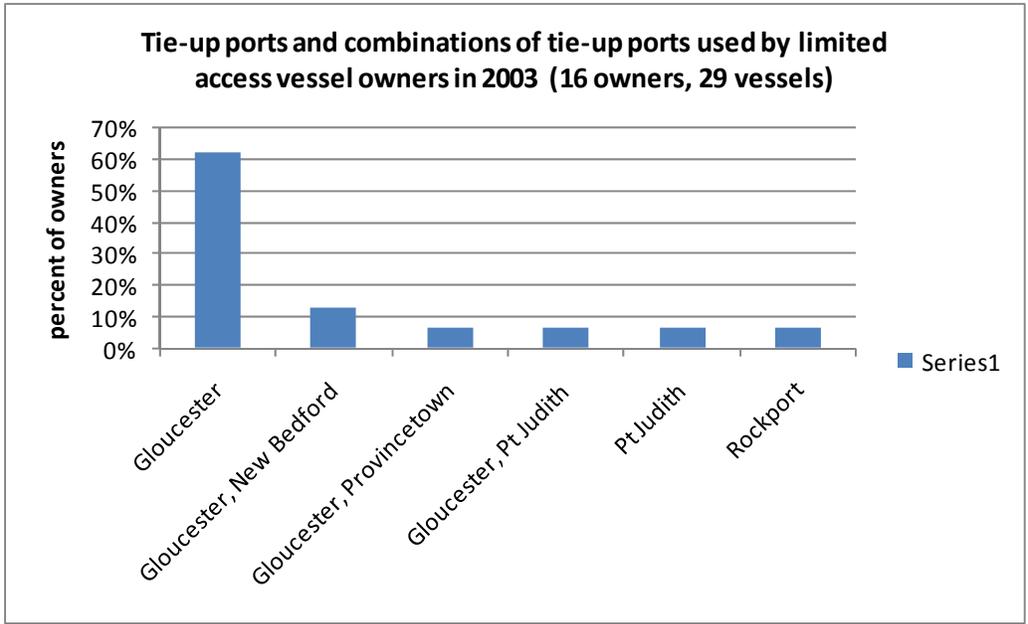
Finally, the use of selling ports by *vessel*, rather than by owner, is shown below: As shown, 93% of the owners' vessels (vessels owned and/or fished by the owners in 2003) used Gloucester as a selling port; 23% used New Bedford as a selling port; 7% used New York (Fulton Fish Market), and 3% used, respectively, Cap-Pele, New Brunswick, Canada; Pt Judith (RI), Boston, and Salem (MA). (As some vessels used more than one selling port – see above – the percents sum to more than 100%.)



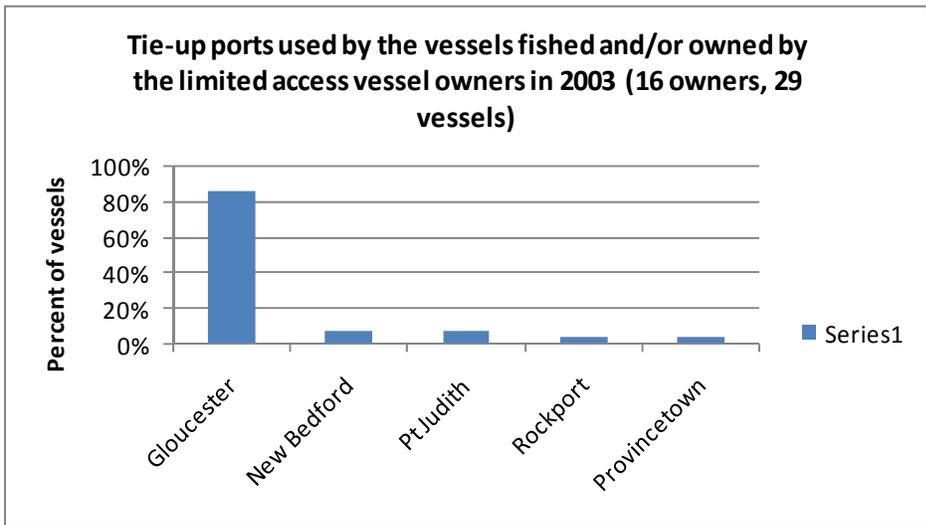
In all, 17% of the owners' vessels used selling ports that were different from their landing ports (the vessels using New York (Fulton), Salem (MA), Boston, and Cap-Pele, New Brunswick, Canada). That the vessels using these latter four selling ports did not overlap (i.e., the vessels using these selling ports can be added together without doublecounting vessels using selling ports that are different from landing ports) can be seen by an examination of the former chart showing owners' use of selling ports and combinations of selling ports; as shown, different owners (and, so, different vessels) used each of these four selling ports (the four that were different from landing ports).

Tie-up ports: The 16 limited access DAS vessel owners used, among them, five different tie-up ports in 2003: Gloucester, Rockport, New Bedford, Pt Judith, and Provincetown. (This analysis is based on information from all 16 of the limited access DAS vessel owners, but only 29 of the 30 vessels they owned and/or fished in 2003.⁴⁸) Each vessel owner used one or two tie-up ports during the year; seventy-five percent (75%) used one tie-up port, and 25% used two tie-up ports. The tie-up ports and combinations of tie-up ports used by the individual owners are shown below. As seen, 63% used Gloucester, 13% used Gloucester and New Bedford, 6% used Gloucester and Provincetown, 6% used Pt Judith, and 6% used Rockport (MA).

⁴⁸ Information about tie-up ports in 2003 was lacking for one of the vessels of one of the owners, an owner who had multiple vessels in 2003.



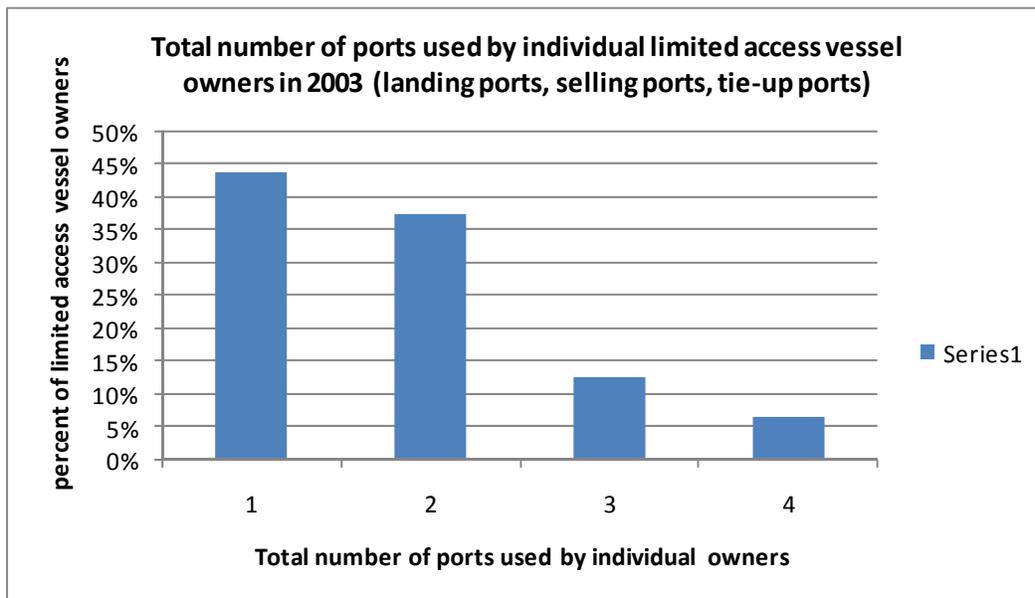
Finally, the use of tie-up ports by vessel, rather than by owner, is shown below. As shown, 86% of the owners' vessels (vessels owned and/or fished by the owners) used Gloucester, 7% used New Bedford, 7% used Pt. Judith, 3% used Rockport, and 3% used Provincetown. (As some vessels used more than one tie-up port –see above – the percents sum to more than 100%.)



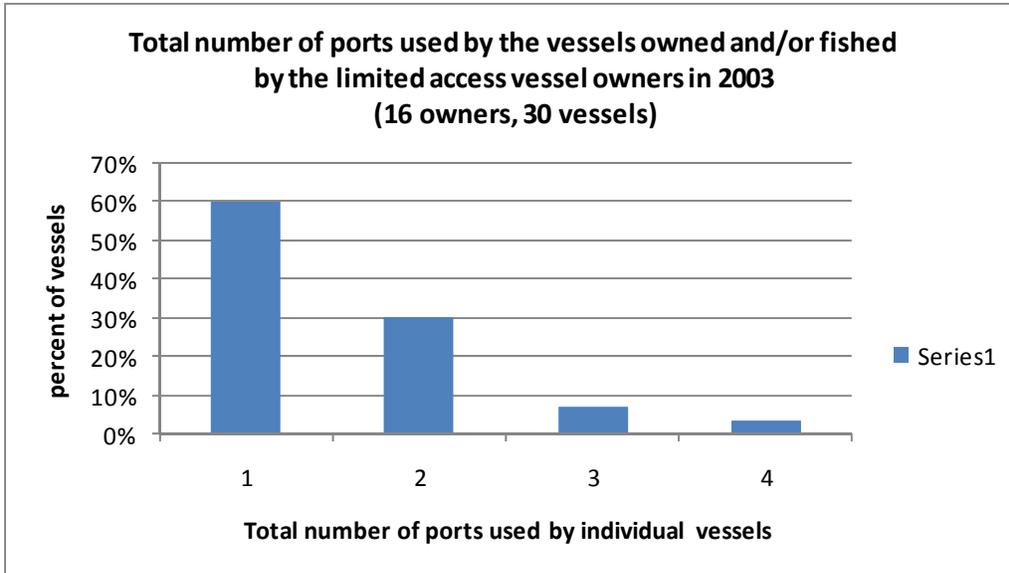
Landing ports, selling ports, and tie-up ports combined: An analysis was done of the total number of ports that were used by individual limited access DAS vessel owners in 2003 for landing fish, selling fish, and tying up vessels. This analysis simply counted the total number of unique ports used by each limited access DAS

vessel owner in 2003, whether for landing or selling fish or tying up a vessel. As with all individual owner analyses presented here, the analyses took into account all vessels owned and/or fished by the individual limited access DAS vessel owners.

In total, the limited access DAS vessel owners used nine ports for landing fish, selling fish, and tying up their vessels in 2003. (The ports, by now, will be familiar: Gloucester, New Bedford, Boston, Cap-Pele (NB, Canada), New York (Fulton Fish Market), Provincetown, Salem (MA), Rockport (MA), and Pt Judith.) Each individual limited access DAS vessel owner used one to four ports for landing fish, selling fish, and tying up vessels. As shown below, 44% of the owners used one port, 38% used 2 ports, 13% used 3 ports, and 6% used four ports.



The total number of ports used by individual vessels, rather than by individual owners, is shown below. As shown, 60% of the owners' vessels (vessels owned and/or fished by the owners) used only one port for landing fish, selling fish, and tie-up in 2003; 30% used two ports; 7% used 3 ports; and 3% used 4 ports.



Residence while fishing and ‘permanent’ residence: In addition to asking about ports used for landing fish, selling fish, and tying up boats, the project also asked about owners’ home residences (their ‘permanent’ residences) and about their residences while fishing. The data on places of home or permanent residence was presented in section 3(a).⁴⁹ In inquiring about residence while fishing, the project asked about places of residence when a vessel was tied up at dock *in between fishing trips* (not, that is, about residence while actually at sea, as this was understood to be – for owners with vessels fishing trips greater than one day – on board the fishing vessel). One hundred percent (100%) of the owners reported that their primary residence while fishing was at home. Thirteen percent (13%) reported a secondary residence while fishing (i.e., in between fishing trips); in both cases, the secondary residence was on board the owner’s vessel, while the vessel was tied up at dock. For 6% of owners, an owner’s vessel was at Provincetown, between trips, and for another 6% of owners, an owner’s vessel was at Gloucester, between trips, and the place of home residence was greater than sixty miles from Gloucester.

IV. Discussion

The data present a remarkably clear picture of New England groundfishing businesses operating from Gloucester in 2003, the year before the 10-year stock rebuilding plans, associated DAS reductions, and DAS transferability provisions went into effect in the New England groundfishery. As indicated, these data have been generated from the businesses with limited access DAS vessels, the businesses that

⁴⁹ The analysis showed that, in 2003, 63% of the limited access DAS vessel owners lived in Gloucester, 25% lived within 20 driving miles of Gloucester, 6% lived within 70 driving miles of Gloucester, and another 6% lived within 120 driving miles of Gloucester in 2003. See section (3)(a).

constitute the major part of the commercial groundfish fishery, and so describe only this sector – the principal commercial sector -- of the groundfish fishery in Gloucester.

Prior to summarizing the picture of this sector in Gloucester, several caveats need be reviewed. First, as was discussed in the methods section, the sampling frame from which the sample was drawn (the limited access DAS vessel subset of the Gloucester principal port list in 2003) likely excluded some groundfish businesses landing fish in Gloucester in fishing year 2003, in particular, those using the port only part of the year (as such businesses could be expected to have identified ports other than Gloucester as their vessels' principal ports). Indeed, analysis of the data from the sample suggests that a large majority of the businesses listing Gloucester as their vessels' principal port in 2003 were businesses with vessels for which Gloucester was not only "principal port" (the port where "the majority of your landings occur") but, also, homeport. Eighty-six percent (86%) of the vessels owned by the business owners used Gloucester as tie-up port in 2003 (some used an additional tie-up port as well). Further, 88% of the business owners lived in Gloucester or within 20 miles of Gloucester; one additional business owner (constituting another 6%) lived within 70 driving miles but used Gloucester as tie-up port and considered Gloucester his vessel's homeport. While this is an interesting finding – that principal port and homeport converge for the majority of the vessels owned by the business owners in the sample – it should not obscure the fact that the sampling frame likely excluded businesses with vessels that fish from Gloucester, or land fish in Gloucester, only part of the year. Hence, the sample should be understood to represent – and the data from the sample to describe – for the most part, the set of groundfishing businesses (with limited access DAS vessels) for which Gloucester, in 2003, was both principal port and homeport, and to exclude, for the most part, any groundfishing businesses (with limited access DAS vessels) using Gloucester part of the year, to fish from, and/or to land fish, as these businesses likely used ports other than Gloucester as principal port (and as homeport).

Second, as was also discussed in the methods section, the sample of business owners was biased – to an unknown degree – in favor of businesses owning multiple limited access DAS vessels. In addition, in a possibly related point, the limited access DAS vessels owned by the businesses in the sample (all with Gloucester as principal port in 2003) were larger, on average, than the full set of limited access DAS vessels with Gloucester as principal port in 2003. And, finally, the limited access DAS vessels owned by the business owners in the sample had a greater proportion of type "A" individual limited access DAS permits than did the full set of limited access DAS vessels with Gloucester as principal port in 2003. Neither the bias in the sample toward businesses with multiple vessels, the greater than average size of the businesses' vessels, nor the higher proportion of "A" permits on the businesses' vessels presents a serious impediment to interpretation of the data from the sample. Regarding the bias, we know the direction of this bias –toward business owners with multiple vessels – and so we can simply note that the sample has a larger percentage of 'large' groundfishing businesses in Gloucester than there are, overall, in Gloucester. (What is interesting about this is that, as discussed below, 'large' is relatively small in Gloucester.) Regarding the greater than average vessel size of the vessels owned by the businesses

in the sample and the higher proportion of A permits on these vessels, these, too, should not detain us. As has been highlighted throughout, the aim in this study was to examine a randomly selected sample of *businesses*, not vessels per se; we aim to characterize the businesses and, only as part of this, the vessels the businesses own and operate.⁵⁰ Furthermore, the vessels owned by the businesses include some very small vessels (the smallest was 35 feet, the first quartile was 41 feet) and the businesses' practices with these vessels are described along with their practices with the larger vessels. While proportions of practices with vessels in the sample may not match proportions of practices with vessels in the full population of 145 limited access DAS vessels, the *range* of practices with vessels in the sample likely mirrors the range in practices with vessels in the full population.

The picture of Gloucester groundfishing businesses drawn by the data from the sample – a picture of the businesses in 2003 – may be summarized as follows:

Structures:

The business owners are men⁵¹; they own their commercial fishing vessels individually (or with spouses) (56%), jointly with one or two male family members (brothers, cousins, brothers-in-law, etc., with or without spouses as well) (19%), or, for some with multiple vessels, individually (or with spouses) *and* jointly with others, family members *or* non-family members (here, too, however, spouses may also be included) (25%). Overall, however, only 6% of the vessels (2/30 of the vessels owned by the businesses in the sample) were owned jointly with persons *not* family members. Ninety-four percent (94%) of the vessels were owned by individuals (some with a spouse) (67%) or by a very small group of family members (27%).

Only 7% of the vessels owned by the businesses were operated (captained) by someone who was neither an owner of the vessel nor a family member of an owner, and all operators (captains) were men. Seventy-six percent (76%) of the businesses' vessels were operated by an owner (either the owner interviewed or a co-owner), and 17% were operated by a family member of an owner (son, nephew, or male cousin). The owners in the sample who did not operate their vessels – or did not operate all of their vessels -- remained involved, from shore, or from the wheelhouse of another vessel, in the operation of their vessels.

Family members of business owners also played additional roles, beyond those of co-owner and/or vessel captain. Thus, some worked as crew on vessels (36% of the vessels owned by the owners had at least one family member aboard as crew; this was

⁵⁰ Moreover, the vessels owned by the businesses in the sample, were they to be treated as a vessel sample per se, would not constitute a random vessel sample: They were not randomly selected, they are the vessels owned by a sample of businesses randomly selected (but for the unavoidable bias toward businesses with multiple vessels).

⁵¹ Spouses may be co-owners, as spouses co-own some vessels; however, the extent to which spouses are co-owners requires additional analysis.

separate from the family members captaining vessels). In addition, 69% of the business owners were born into families in which at least one member of the preceding generation was a fisherman and some of these owners claimed many forebears in the business. Sixty-three percent (63%) of the owners first fished with – and considered themselves to have learned fishing from – family members in a preceding generation. Among those who did not learn from family, there were some -- 13% of owners overall – who likened the person from whom they had learned commercial fishing to a family member (like “a father”). (Others who had not learned from family members recalled with precision and respect the name of the person from whom they had learned and the circumstances of that learning.)⁵²

Notably, 50% of Gloucester’s groundfishing business owners in 2003 were Sicilian-Americans, of first, second, or third generation; 25% were first generation (all of whom had lived in and fished from Gloucester – while in some cases fishing from elsewhere as well – from at least 1983, the earliest year inquired into in the study).⁵³ Equally notably, however, while there is a common assumption (bearing empirical inquiry not – yet – carried out in this study) that it is among Sicilian-Americans that kinship structures are key to fishing businesses in Gloucester, the data produced here show that – whatever the extent of the relationship between kinship structures and fishing businesses among Sicilian-Americans in Gloucester – there is a relationship between kinship and business in fishing businesses in Gloucester *other* than those owned by Sicilian-Americans. Even were all the Sicilian-American business owners in the sample among those born into families with a commercial fisherman (or commercial fishermen) in a preceding generation (again, an inquiry not yet undertaken), they would not account for all the business owners in the sample (69%) for whom this is the case.⁵⁴

The importance of families in the social organization of fishing businesses at present should not obscure the extent to which some fishing businesses at present are individual enterprises, with a single individual (in some cases with a spouse) the sole owner. Fifty-six percent (56%) of the business owners owned their vessels (whether a single vessel or multiple vessels) individually (in some cases with a spouse), and across all the business owners, 67% of the vessels owned were individually owned (again, sometimes with a spouse). Finally, while the data in the study were insufficient for quantification, it was also clear that many but not all of the business owners used the corporate form to hold their vessels, both in cases in which a single individual held the

⁵² The study did not examine other roles that family members may be playing in fishing businesses; the obvious one to have looked at – or to look at in the future – would be bookkeeping and other shoreside financial work associated with commercial fishing businesses.

⁵³ Miller and Van Maanen reported in 1979 that, at that time in Gloucester, “about 85% of the fishermen (and owners) of the dragger fleet” were “of Italian, Italian-American, and Sicilian descent” (1979:379).

⁵⁴ Further systematic study of the relationships at present between fishing businesses and kinship structures in New England is clearly called for; compare, in earlier years: Poggie and Gersuny (1984), and Terkla, Doeringer, and Moss (1988).

corporation holding the vessel and in which a small group of owners held the corporation.

Data on the total number of crew *per groundfishing business* remain to be analyzed (a matter made complicated by the use, in many cases, of the same crew on two or more vessels owned by a business). However, each business had no more than four crew per vessel, and this included groundfish vessels 75 feet, 85 feet, and 96 feet long. The mean and the median per vessel were three crew (the mean was 2.9), and only about 12% of the vessels had only one crew (i.e., a captain – in all cases, an owner – fishing alone).⁵⁵

Strategies:

The number of vessels held by groundfishing businesses could well be considered a matter of the structure of the businesses rather than a matter of their strategies (as the number of crew per vessel could well be considered a matter of strategy rather than of structure). However, the number of vessels held by businesses is included here, quite intentionally, as matter of strategy. All but one of the vessels owned by the business owners were limited access DAS groundfish vessels (albeit with varying sets of other federal and/or state permits) and fully 88% of the business owners were fishing, in 2003, for groundfish (using, among them, 80% of the vessels owned among them). (Only 25% of the business owners were fishing *exclusively* for groundfish, however, a matter taken up below.) Thus, a large majority of the groundfish business owners were in fact in the business of fishing for groundfish in 2003. And, as shown, each business owner held, individually or jointly, one to four vessels, and both median and mean were two vessels (the mean was 1.9). The vessels owned ranged in size from 35 feet to 137 feet (the largest vessel with a limited access DAS permit, however, was 111 feet).

As described in the Introduction, by 2006, there had been four reductions in vessels' DAS allocations since the establishment of vessels' baselines and the initial reduction in 1994 (in 1997, 2002, 2004, and 2006). The 1997 cut had halved vessels' allocations from their baselines, leaving vessels with "fleet" or "B" limited access DAS permits – by far the prevalent limited access DAS permit type – with 88 DAS to fish for groundfish in a year. As neither permits nor DAS could be consolidated at that time, some groundfish businesses invested in buying one or more additional limited access DAS vessel(s) (while permits are technically not transferable, they are bought and sold as part of complex vessel transactions), fishing each vessel its full complement of DAS. This reliance on multiple vessels as a strategy in the groundfish business was becoming even more critical by 2003; at that time, business owners had experienced a further reduction in their vessels' DAS (in 2002, brought about as a result of federal litigation challenging NOAA Fisheries failure as of then to produce the 10-year stock rebuilding plans and attendant regulations) and were looking straight into the expected 2004 cut

⁵⁵ The data on crew, as indicated in Part III, was based on 87% of the vessels owned by the business owners, all of which were vessels targeting groundfish.

(to accompany the 10-year stock rebuilding plans finally expected that year). Finally, in addition, there was much talk at the time in the regulatory arena about intentions to promulgate DAS transfer mechanisms as part of the 2004 regulations to allow, for the first time, consolidation of DAS, temporary or “indefinite,” from multiple permits onto a single permit.

Thus, while we do not know, from the data, *when* the Gloucester groundfish business owners bought the vessels they held in 2003, it comes as no surprise that so many owners held more than one limited access DAS vessel in 2003: only 31% of the owners held, individually or jointly, one vessel; 69% held two, three, or four vessels. Moreover, it will be interesting, when the 1983 and 1993 data for these business owners are analyzed, to examine the owners’ histories regarding numbers of vessels owned and patterns of vessel ownership (by them or by others’ businesses or vessels in or on which they may have worked in those years). Other factors may well have driven numbers and patterns in those years, however, and so comparisons must be cautious. Finally, as discussed throughout this report, we know that the sample was biased toward businesses owning multiple vessels (but we do not know by how much); what is of note more than anything is the fact that even with this bias, the groundfishing businesses were very small, with an average of two groundfish vessels per business, with some of the vessels owned individually and some jointly.

Strategies apart from the number of vessels (and the number of crew per vessel) involved the species to be targeted, the areas to be fished, the gears to be used, and the ports to be used. These strategies may be usefully considered fishing and mobility strategies. The businesses targeted one to three species or species groups in 2003. Only 31% of the business targeted only one species group (25% of which targeted the groundfish species group alone and 6% of which targeted lobster alone). The balance – 69% - pursued two (44%) or three (25%) species or species groups. Not all the businesses targeted groundfish in 2003; 88% pursued groundfish, while the remaining 12% pursued lobster or herring and hagfish. It should be remembered that all the businesses had a limited access DAS groundfish permit on at least one vessel (this was one of the defining characteristics of the sample of businesses studied). By 2003, however, fishery-wide, some vessels’ limited access DAS permits had lost the greater part of their usefulness; the 2002 DAS reduction was the first in the series of DAS reductions to reduce vessels’ DAS allocations to a percentage of DAS actually used in a former period of time (i.e., to base the reduction on DAS use and fishing “history”), and it limited vessels that had not used their DAS in the then-relevant time period (1996-2000) to 10 DAS per year. Whether the Gloucester groundfishing businesses not targeting groundfish in 2003 were all among those so limited by the 2002 DAS reduction, we do not know; it should be noted, however, that the owner of one business not targeting groundfish in 2003 was extremely “bitter” – his word – about his vessel’s loss of DAS.⁵⁶

⁵⁶ If this business owner was referring to the 2002 cut – and was among those whose vessels were allocated 10 DAS in 2002, he would have had to have had no record of DAS use and groundfish landings from 1996-2000, i.e., , not to have targeted (or have a record of targeting) groundfish in those years.

Twenty-five percent (25%) of the groundfishing businesses, as indicated, targeted groundfish alone in 2003; 63% of the businesses targeted groundfish *and* one or two other species as well, specifically, one or two of: monkfish, lobster, whiting, scallops, dogfish, and red crab. (The remaining 12%, as indicated, pursued lobster, and herring and hagfish.) It should be pointed out that we do not know, among the businesses targeting more than one species or species group, the relative percentage of time, effort, or landings associated with the pursuit of each species or species group. What we do know, however, is that 71% of the businesses fishing for groundfish (63% of the businesses overall) were fishing for groundfish and one or two other species as well.

To pursue these species, the businesses used, among them, seven different gear types in 2003. The majority, however, - 63% - used only one gear type in 2003. This one gear type varied, however; 44% used bottom trawl exclusively, 13% used gillnets exclusively, and 6% used traps exclusively. Thirty-eight percent used two gear types in 2003, and 6% used three gear types in 2003.

In pursuing these species, moreover, the businesses took – or sent – their vessels to the inshore Gulf of Maine, the offshore Gulf of Maine, Georges Bank (including the Canyons), and to relatively near shore areas 60 or more miles from Gloucester, an area off Cape Cod (“the outer Cape”) and an area off Nantucket. Only 40% of the businesses fished in a single area (using these large and general ‘areas’ as a measure); these 40%, it should be noted, fished exclusively in the inshore Gulf of Maine (in areas including Massachusetts Bay, Ipswich Bay, Stellwagen Bank, Jeffreys Ledge, and others). The remaining 60%, however, fished in two (33%), three (20%), or four (7%) of these general areas in 2003. They also fished anywhere from ‘0’ miles out (i.e., in state waters) to 200 miles from shore. Only 27% of the businesses fished their vessels exclusively within 20 miles from shore; another 20% fished from the inshore to 50 miles from shore; 13% fished from the inshore to 100 miles from shore; 33% fished from the inshore to 150 miles from shore; and 7% fished exclusively offshore (exclusively from 50 to 200 miles from shore).

The businesses took – or sent – their vessels for trips of varying length, reflecting the variation in areas fished and distances from shore fished: One-third of the businesses (33%) made day trips only (all or part of a single day) with their vessels, and another 20% made short only trips with their vessels (one to three days); thus 53% made trips one to three days in length. The remaining 47% took or sent their vessels out for trips that ranged from one day to nine days, and only 13% sent their vessels for trips that were no shorter (and – as it happens, no longer) than five days.

Finally, in pursuing these species – and in selling them once they were caught – the businesses used multiple ports: to land fish, sell their fish, and tie-up their vessels. As discussed in detail in Part III, the businesses used, among them, nine different ports to land and sell fish and to tie-up their vessels; these ports ranged to the south to New York’s Fulton Fish Market (a selling port, i.e., to which some businesses trucked part of their catch) and to the north to Cap-Pele, New Brunswick, Canada (another selling port,

to which part of a business' catch was trucked), an onshore span (calculated in driving miles) of some 775 miles. Not all businesses used multiple ports, it is important to point out: Forty-four percent (44%) used one port alone in 2003 for landing fish, selling fish, and tying up vessels (in doing so, these 44% of businesses used a single port for a full 60% of the vessels owned by the businesses). But, 38% of the businesses used two ports, 13% used three ports, and 6% used four ports. As indicated, these were not all ports to which businesses actually took their vessels; some (four unique ones) were selling ports only, i.e., ports to which the businesses took their fish but not their vessels. However, all were ports used by the businesses in 2003.

Mobility:

Mobility – of vessels and of vessels' catch – was a strategy for over half the groundfishing businesses in Gloucester in 2003. Mobility was *not* a strategy for the 40% of businesses that fished exclusively in the inshore Gulf of Maine. Nor does it appear that mobility was a strategy for the 44% of businesses that used only one port (for landing fish, selling fish, and tying up vessels) in 2003. (The relationship between these two sets of businesses has not been explored in the analysis thus far, but a substantial overlap between the two sets is expected.)

Mobility – of vessels – was a strategy for the 60% of businesses that fished in more than one area in 2003 (including the near shore areas far from Gloucester, i.e., off Cape Cod and off Nantucket), and the 53% of businesses that fished over 50 miles from shore in 2003 (87% of which, or 46% overall, also fished in the inshore). Further, the mobility of vessels – and of vessels' catch – was a strategy for the 56% of vessels that used more than one port – from two to four ports each – in 2003. These ports, as shown, were used to land fish, to sell fish, and to tie-up vessels.

Two very important points remain to be made about the use of mobility by the approximately half of the Gloucester groundfishing businesses that used mobility as a strategy in 2003. The first point is from the data themselves: These half or so of the Gloucester groundfishing businesses that used some form of mobility as a strategy in conducting their businesses were strongly anchored in Gloucester itself. In 2003, for 63% of the business owners, Gloucester was place of residence, and for 25% of business owners, place of residence was within 20 miles of Gloucester. This meant, in 2003, a total of 88% of business owners with place of residence Gloucester or a locale within 20 miles of Gloucester.⁵⁷ And, in 2003, 100% of business owners resided – when they were not on their vessels at sea – in their places of residence, i.e., at home. Thus, the 63% of owners for whom Gloucester was home lived in Gloucester in 2003, and the 25% of owners for whom a locale within 20 miles of Gloucester was home lived within 20 miles of Gloucester. For the approximately 50% of business owners for which mobility – in some form – was a strategy in 2003, therefore, we may say, first, that

⁵⁷ Moreover, all 63% for whom Gloucester was place of residence in 2003 had also had Gloucester as place of residence in 1993 and in 1983; so, too, the 25% of owners with place of residence within 20 miles of Gloucester in 2003 had had place of residence within Gloucester in 1993 and 1983.

mobility was a strategy used by – and for – the business, and, second, that, mobility - as a strategy for the business – was used in service of a goal of fixity, that is, in service of the goal of allowing the business owner to remain at home, in or near Gloucester.

The second point about mobility derives from what the data do not tell us: This is the *degree* of mobility used by the business owners that used mobility as a strategy. To determine degrees of mobility, we would need to know, for the businesses that used multiple areas of ocean to fish, multiple distances from shore to fish, and multiple ports, the relative frequencies with which (or relative amounts of time or effort in which) different areas, distances, and ports were used. Those are data we do not have, and collection of such data is for another time. What we do know, however, as a result of this study, is that mobility, in some form and in some degree, was a strategy for about half the Gloucester groundfishing businesses in 2003. And, we may further observe that it was a strategy used in service of enabling Gloucester groundfishing businesses to remain Gloucester groundfishing businesses.

Finally, it remains, also, to future work to discern the use of mobility, overall, in 2003 relative to other years. Multiple factors affect mobility in any given year; among these are: stocks' conditions, market conditions, business strategies and investment decisions, the costs of inputs (e.g., fuel), knowledge and experience, and the myriad rules governing fisheries. It is worth noting that, in 2003, rules governing the New England groundfishery likely had contradictory effects on businesses' mobility strategies in the groundfishery: On the one hand, the rolling closures of inshore waters may have led some fishing businesses to become more mobile than they would have been otherwise, leading them, for example, to send their vessels south to fish (e.g., off Cape Cod and off Nantucket) when inshore waters off Gloucester and Cape Ann were closed. On the other hand, the DAS effort control program – in particular, the then-newly-effective reduction in vessels' DAS allocations (in effect in 2002) – may well have constrained businesses' use of mobility strategies for their vessels: The limits on vessels' time on the water may well have restricted vessels' movement on the water. However, here, too, contradictory effects of the rules may be expected; some few businesses may well have compensated for limits on time on the water by taking their vessel(s) from homeport (for most, Gloucester) to another tie-up port (e.g., New Bedford) to be closer to certain fishing grounds during part of the year.

V. Conclusion

Using data collected from a random sample of groundfishing businesses based in Gloucester in 2003, this study investigated the business' structures and strategies in 2003 and explored the question whether mobility was a strategy for these businesses.⁵⁸ It is hoped that the results may be helpful to industry members, fishery managers, the City of Gloucester, and others who seek to understand the New England groundfishery and plan for its future. It is also hoped that further research will focus on the structures and strategies of fishing businesses, and that, in this regard, research – and planning –

⁵⁸ As indicated, moreover, further investigations of the data collected in this study are also planned.

will recognize and focus on the fact that, as is insisted in the field, commercial fishing *is a business*. Just as importantly, however, it is hoped that the focus on businesses so needed in the analysis of fisheries – and the New England groundfishery in particular – will help to illuminate – and not obscure – the intersections among businesses, families, and communities in fisheries, in particular, in the New England groundfishery.

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