

1.0 INTRODUCTION AND BACKGROUND

1.1 BACKGROUND

Beginning in 1994, with the implementation of Amendment 5 to the Northeast Multispecies Fishery Management Plan (FMP), vessels targeting whiting and red hake were increasingly restricted by federal regulations designed to protect large mesh regulated groundfish species in the Gulf of Maine. Small mesh fishing in New England became limited spatially and temporally by the establishment of Regulated Mesh Areas (RMAs) in the Gulf of Maine and on Georges Bank, offering few opportunities for fishermen who traditionally fished for species like whiting and red hake. Vessels in port communities like Provincetown (MA) and Gloucester (MA) faced the possible loss of a fishery that had become an important seasonal component of their operations.

Framework 9 to the Multispecies FMP, implemented in April of 1995, established regulations that prohibited small mesh fishing in the Gulf of Maine and on Georges Bank, initially implemented under emergency action in December of 1994. The prohibition on small mesh fishing was implemented to prevent high bycatch levels of regulated groundfish, particularly cod, haddock and yellowtail flounder, with expected displacement of fishing effort from heavily regulated large mesh groundfish fishing on to small mesh fisheries. However, to allow small mesh fisheries that have no or very low bycatch of regulated groundfish, the emergency and framework actions established a program through which a fishery could be “exempted” from multispecies minimum mesh regulations if it is certified by the Regional Administrator to have a bycatch of the ten regulated groundfish species that is less than five percent of the total catch. In 1996, through the implementation of Amendment 7 to the FMP, the restrictions were expanded, and any fishery not conducted with exempted gear (gear not capable of catching regulated multispecies) or not under a multispecies or scallop day at sea was prohibited unless it met the 5% regulated multispecies bycatch standard for exempted fisheries.

Small mesh whiting and red hake fisheries in the Gulf of Maine were largely eliminated by the restrictions, including the fisheries and areas targeted by vessels originating from Provincetown and Gloucester. Despite the fact that a majority of these waters fell under state authority, almost all small mesh fishermen in the area possess federal multispecies permits, subjecting them to federal restrictions regardless of where they fish. In turn, Massachusetts fishermen began seeking federal exemptions to operate their traditional small mesh fisheries. They turned to the Massachusetts Division of Marine Fisheries (DMF) to help them develop a whiting fishery that minimizes the bycatch of regulated species.

According to the regulations for the Northeast multispecies fishery, a *Multispecies Exempted Fishery* may be added if there are sufficient data to ascertain the amount of regulated species bycatch and if the Regional Administrator, after consultation with the Council, determines that the percentage of regulated species bycatch is, or can be reduced to, less than five percent, by weight, of the total catch and that such an exemption will not jeopardize fishing mortality objectives. Bycatch data necessary to establish a *Multispecies Exempted Fishery* are most often collected through the establishment of an experimental fishery administered through NMFS’ *Exempted Experimental Fishing Program*. At a minimum, *Multispecies Exempted Fisheries* are

required to comply with the following bycatch provisions:

- a prohibition on the possession of regulated species (Atlantic cod, witch flounder, American plaice, yellowtail flounder, haddock, pollock, winter flounder, windowpane flounder, redfish, and white hake)
- a limit of 10 percent monkfish or monkfish parts, by weight, of all other species on board
- a limit of 10 percent lobsters, by weight, of all other species on board or 200 lobsters, whichever is less
- a limit of 10 percent skate or skate parts in the Southern New England regulated mesh area, by weight, of all other species on board.

The current multispecies regulations allow for the Council to recommend to the Regional Administrator, through the framework adjustment process, additions or deletions to *Multispecies Exempted Fisheries*, either existing or proposed. This may occur in fisheries for which there are insufficient data or information for the Regional Administrator to determine, without providing an opportunity for public comment, the percentage bycatch of regulated species. In addition, the Council may recommend an addition or deletion to *Multispecies Exempted Fisheries* if the addition or deletion is consistent with the goals and objectives of the FMP. In light of extensive cooperative research completed by the Massachusetts Division of Marine Fisheries and the fishing industry, as well as the importance of fishery as an economic alternative for the industry, the Council considers the raised footrope trawl fishery to be a reasonable addition to the list of *Multispecies Exempted Fisheries*.

1.2 GEAR DESCRIPTION

The “raised footrope trawl” was developed by scientists at Massachusetts DMF’s Conservation Engineering Department in cooperation with the fishing industry in Provincetown and Gloucester. The raised footrope trawl is designed to fish 1-2 feet above the ocean bottom and was developed primarily to catch whiting, red hake, and dogfish. The design capitalizes on fishes’ variable habitat preferences as well as swimming behaviors among target and non-target species; the net retains those fish that swim above the substrate while passing over those that reside closer to it. The net’s most innovative feature is a chain sweep that is longer than the footrope. This allows the chain sweep to contact the bottom after the footrope has already passed by. Slow-swimming demersal fish and most invertebrates are not able to enter the mouth of the net if they are disturbed by the sweep because the mouth of the net has already passed over them.

Separator trawls and raised footrope trawls have been used in certain fisheries in the Gulf Coast as well in the North Sea. The net design for this whiting fishery started with research on a Provincetown trawler in 1991. The original “experiments” were accomplished when DMF, with New England Fishery Management Council funding, performed a set of gear trials with a trouser-trawl (a specially designed horizontal separator net with two codends) fitted with a moveable panel in the net mouth, and determined that at a height of 1-2 feet “off-bottom,” optimal trawl catches would result with most whiting retained and flatfish reduced by up to 95% (Carr and Caruso, 1993). This net separated catch into upper and lower codends so as to determine the vertical availability to the trawl net. From this work, the net was modified into a raised footrope trawl. The trawl was further used in experimental fall whiting fisheries during the mid-1990s to ascertain its effectiveness as a commercial trawl. The intent of the trawl is to

fish for whiting but eliminate, or sharply reduce, the catch of flatfish and other bottom tending species. The raised footrope trawl, version one, has allowed a fall fishery in Massachusetts and Cape Cod Bay because of its success. Massachusetts DMF intends to continue research to refine the net's design for use in New England's small mesh fisheries.

1.3 HISTORY OF THE EXPERIMENTAL FISHERY

DMF has promoted the raised footrope trawl as a bycatch solution for the Massachusetts whiting and red hake fishery in Cape Cod Bay and lower Massachusetts Bay with its predominate bycatch of juvenile flatfish: American plaice, yellowtail flounder, and winter flounder. DMF's sea sampling during 1992-1994 showed that standard whiting trawls with heavy groundgear nearly always caught substantial amounts of juvenile flatfish, and nearly all tows exceeded the 5% regulated species bycatch standard. Discard mortality of juvenile flounder and new-shelled lobsters (common during fall) was presumed to be substantial. In 1994, DMF furnished the National Marine Fisheries Service (NMFS) with whiting fishery sea sampling data for Cape Cod Bay that confirmed bycatch in this area was above 5% and was not exemptible under the 5% standard.

Since 1995, DMF has applied to NMFS for exempted experimental permits to allow a limited number of trawlers to target small mesh species from September through December in upper Cape Cod Bay and adjacent waters with a raised footrope trawl. DMF solicited fishermen's opinions about the proposed conduct of the fishery, such as appropriate areas, trawl design specifications, bycatch restrictions, and other issues. DMF has routinely met with fishermen from Chatham, Gloucester, and Provincetown to discuss developments in the experimental fishery. These fishermen were optimistic that the raised footrope trawl could solve bycatch problems, and they hoped to re-open certain areas during times when whiting and red hake catches historically have been productive.

From the outset, the experimental program's goals were to:

- 1) Continue research on optimal gear configurations to reduce bycatch and allow "clean" fisheries where bycatch of regulated species totals less than 5% of the overall weight of the catch on a consistent basis; and
- 2) Identify and verify – through sea sampling and catch reports – areas and times where viable fisheries for target species (whiting, red hake, dogfish) can be conducted.

DMF identified two key elements needed for success of the fishery: (1) educating fishermen about the gear's design and its proper use; and (2) promoting compliance through conservative bycatch restrictions and strong penalties for non-compliance. Also, fishermen and dealers noted a market incentive for fishing the net as designed – soft-bodied whiting and red hake are less likely to be damaged and will fetch a higher price when the catch is free of crabs, sculpins, lobster, and other hard-bodied or spiny organisms.

In late 1995 and during the summer of 1996, DMF conducted a single-vessel federally-permitted experimental fishery with a "raised footrope trawl" and enlisted the F/V Charlotte G., a Provincetown trawler (McKiernan et al. 1996). DMF supplied 100% observer coverage to document *all* trips. After considerable refinement, catches of non-target species were

consistently below 5%.

Each year after approving DMF's list of applicants, NMFS sent vessels' federal experimental fishery authorizations to DMF. The number of permitted vessels in the fishery increased each year from 1995-1998 with a low of one vessel in 1995 to a high of 43 in 1998. The number of participants was lowered in the 1999 season to 28 as part of DMF's plan to closely monitor and manage, if necessary, regulated groundfish bycatch. DMF tried to meet with captains or vessel owners to discuss permit conditions and to inspect the vessel's trawl for compliance with state specifications. After net inspections, those vessels and captains that participated in past DMF raised footrope trawl experimental fisheries were given their state and federal experimental permits. Vessels without prior experience using the experimental net were required to "earn" the permits by demonstrating proficiency with the design by taking a DMF observer and showing bycatch levels less than 5% of the overall catch.

In October 1996, NMFS granted DMF's request to open the experimental fishery to 14 other local trawlers that had historically participated in Cape Cod Bay's whiting fisheries. Sea sampling over 20 trips showed whiting, red hake, and dogfish at about 90% of the retained catch. About 28% of the overall catch was discarded; this contrasted with past years' sampling (when "normal" whiting nets were deployed) that showed about 60-70% of the catch discarded. Catches of juvenile flounders dropped in 1996 to minimal levels, and 19 of 20 sampled trips were below 5% in terms of regulated species bycatch. The early November departure of whiting and red hake from the small, approved fishing area prevented DMF from collecting further results, since the vessels were not permitted outside of the requested area in northern Cape Cod Bay/Massachusetts Bay.

During May and June 1997, DMF continued this work with a small-scale experiment including six vessels. Vessels made paired tows where catches from a traditional whiting trawl and a raised footrope trawl were compared. With observers aboard each trip, three Gloucester vessels targeted whiting off Cape Ann, and three Provincetown vessels targeted dogfish in waters adjacent to Cape Cod. Off Cape Ann, the results were dramatic – traditional whiting nets' regulated flatfish species catch averaged 171 lbs./hr, but was lowered to 29 lbs./hr with the raised footrope trawl, a reduction of 83%. However, even with the low bycatch, low whiting catch rates caused most tows to exceed the 5% allowance standard. Off Provincetown, the bycatch reduction results were similar, with an 89% reduction in regulated flatfish (66.2 lbs./hr. to 7.1 lbs./hr) attributable to use of the raised footrope trawl.

During the fall of 1997 and 1998, DMF tried to broaden the areas that the fishery might be approved to include other areas in federal waters adjacent to Massachusetts. DMF sought to re-open northern Cape Cod Bay, portions of Massachusetts Bay (west of Stellwagen Bank), and areas east of Cape Cod (the "Nauset" area) to traditional small mesh fisheries for whiting and red hake. Some of these areas had been requested for opening by industry in the past, but those requests were denied by NMFS after analyses showed that bycatch of regulated species had, or was likely to, exceed 5% with an unmodified otter trawl (NMFS, 1995).

Results in 1997 and 1998 showed bycatch of regulated species averaging above 5% in the area along the western edge of Stellwagen Bank. Consequently, DMF did not request the

experimental fishery be conducted in this area during 1999. Also, there was minimal fishing effort expended in two other areas approved for experimental fishing north and west of Stellwagen, so DMF did not request an experimental fishery there either.

In 1999, the raised footrope trawl fishery was approved on a limited basis by NMFS. For September – December 1999, DMF requested that NMFS re-authorize the experimental fishery for only three of the six previously studied areas: upper Cape Cod Bay (Area 2B), lower Stellwagen (Area 4) and east of Cape Cod (Area 3). Area 2B is primarily northern Cape Cod Bay and southern Massachusetts Bay, the site of DMF's 1995-1996 federal experimental fishery programs and has been the site of DMF's past gear and sea sampling studies dating back to 1989. Area 4 is the adjacent area to the east that encompasses southern Stellwagen Bank. In 1997, Provincetown fishermen requested Area 4 to be opened after October 20 when whiting were expected to migrate out of the southern portions of Area 2B. This area is fished routinely by Provincetown-based vessels because of their proximity to the homeport (Figure 1). DMF did not request that the other three areas north and west of Stellwagen (Areas 1, 2A, and 2C) be re-opened for experimental fishing in 1999 because in two areas (1 and 2A), fishing effort was minimal during the past two year's experimental fisheries, and in the third area (2C), bycatch of cod and redfish was high enough to preclude the 5% standard from being achieved.

The 1999 fishery was most notable because during the two most productive months (October and November), much of the requested area in upper Cape Cod Bay was scheduled to be closed by federal "rolling closures" to all gears capable of catching groundfish (Blocks 124 and 125). These closures were implemented through Framework 27 to the Northeast Multispecies FMP. In a letter dated August 19, 1999, NMFS' Regional Administrator announced that the fishery would be approved, but not in the areas encompassed by the October-November Rolling Closure.

The impacts of the 1999 "rolling closures" would have prevented DMF from conducting gear trials during the two most productive months of the experimental fishery. Moreover, impacts on fishermen, the whiting fleet, and dependent ports would have been substantial. After considerable discussion and negotiation among DMF, industry, NMFS, the Council, and others, the experimental fishery was allowed to proceed in the "rolling closure" for approved vessels. Federal official's concerns about the fishery occurring within the October-November "rolling closure" warranted enhanced data collection by DMF during the 1999 program. Consequently, the 1999 program was the largest and most intense data gathering exercise ever conducted by DMF. Data collection was intense through sea sampling (more than 60 trips) and the submission of fishermen's reports regarding the content and location of each tow on state-issued logs.

Figure 1 Map of 1999 Raised Footrope Trawl Experimental Fishery Areas (1999)

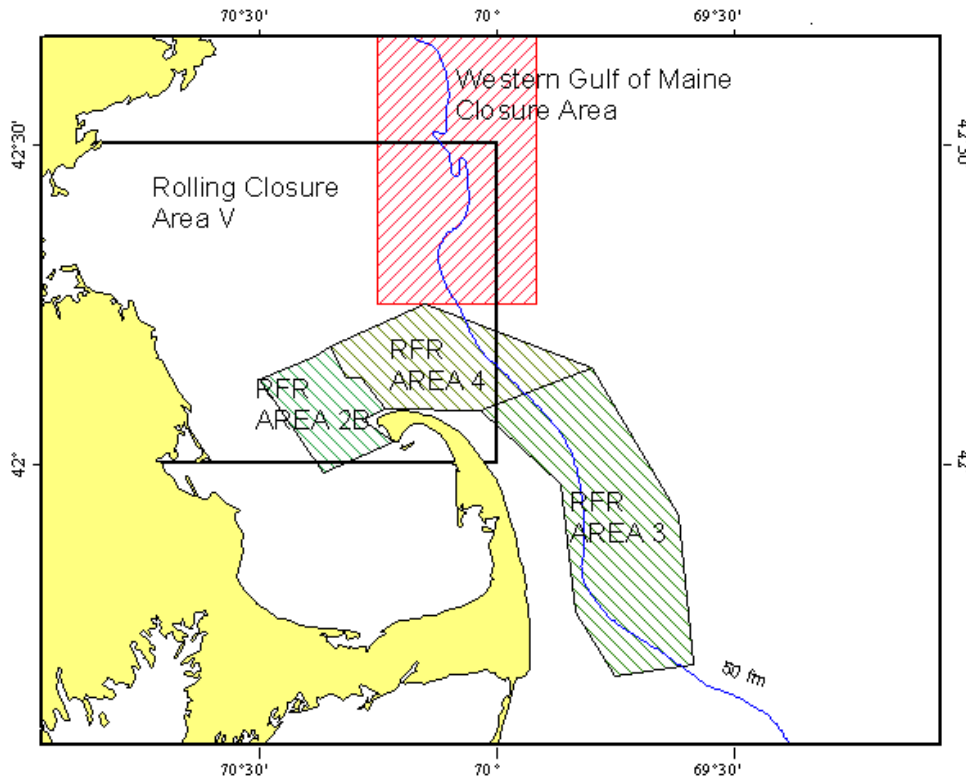


Figure 2 – Figure 5 illustrate (by month) all observed and unobserved tows reported in Areas 2B and 4 during the 1999 experimental raised footrope trawl fishery. The tows have been plotted by drawing a straight line between reported (by either fishermen or observers) start and end coordinates. Note that some of the tow locations extend beyond the boundaries of the experimental area and/or across land. This is because the tow data have been plotted exactly as they were reported. DMF attributes some of this to either transcription error or GPS error. Also, some tow coordinates were reported to DMF in LORAN and were subsequently converted to latitude/longitude, which could account for start or end points slightly outside the experimental area. These figures demonstrate that effort in this fishery is very concentrated in areas where whiting are located; when participating in this fishery, vessels “chase” the whiting and often fish in close proximity to one another.

Figure 2 Observed and Unobserved Tows Reported in Areas 2B and 4 During September in the 1999 Experimental Raised Footrope Trawl Fishery

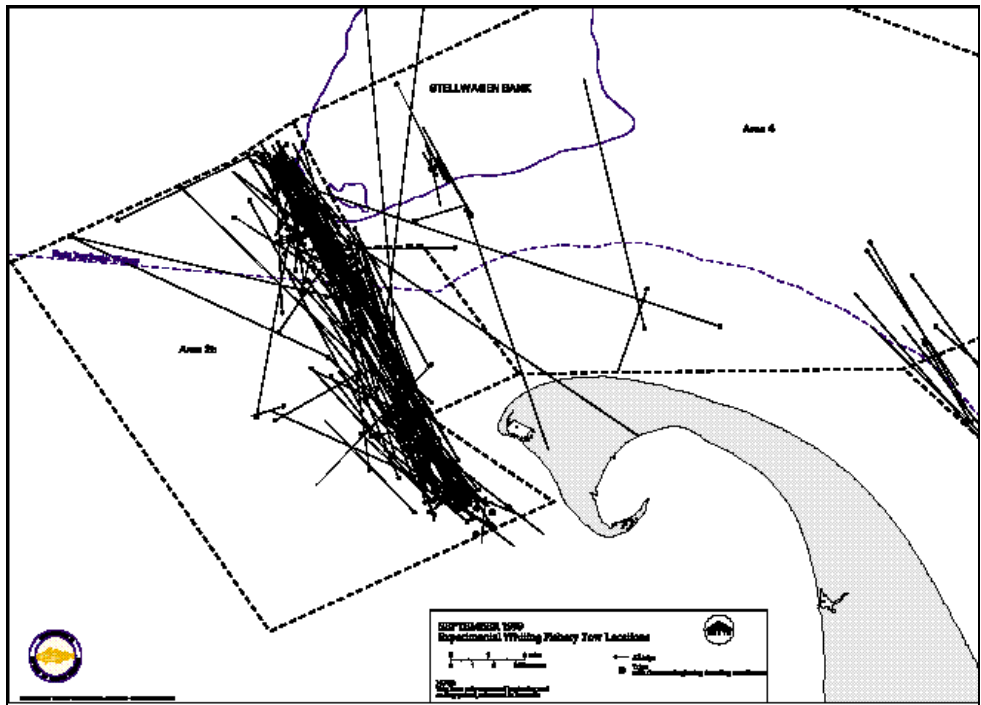


Figure 3 Observed and Unobserved Tows Reported in Areas 2B and 4 During October in the 1999 Experimental Raised Footrope Trawl Fishery

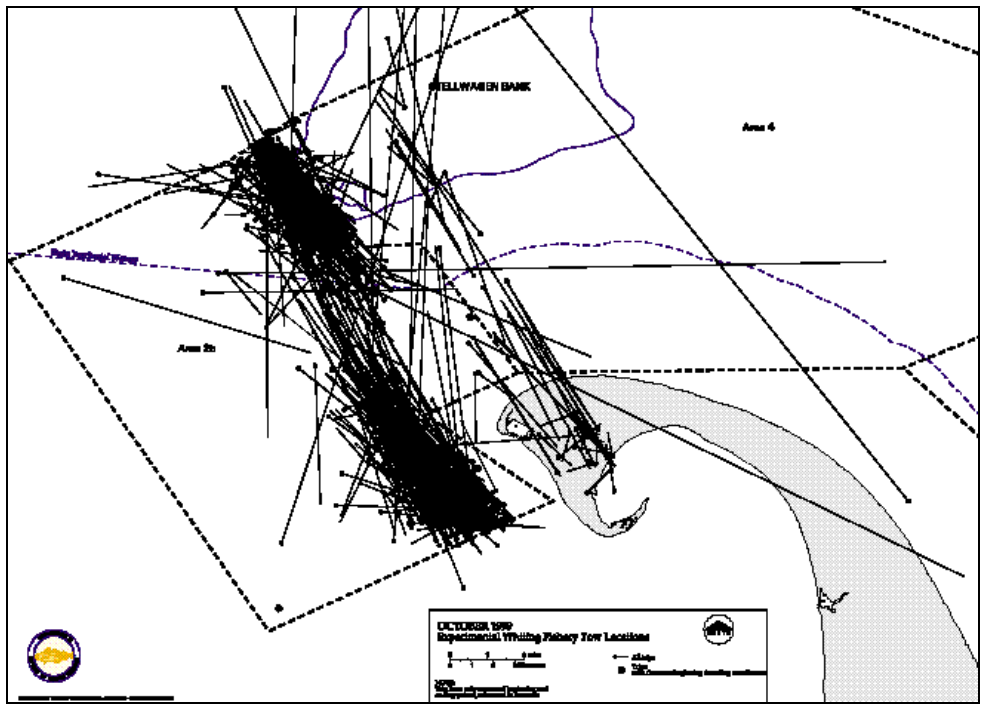


Figure 4 Observed and Unobserved Tows Reported in Areas 2B and 4 During November in the 1999 Experimental Raised Footrope Trawl Fishery

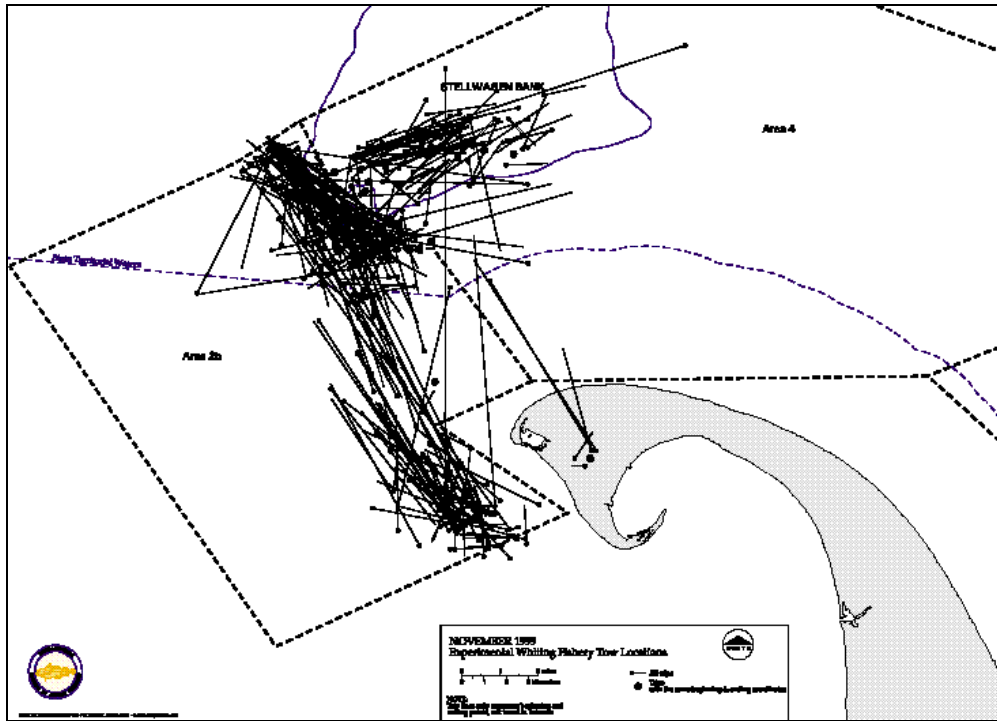


Figure 5 Observed and Unobserved Tows Reported in Areas 2B and 4 During December in the 1999 Experimental Raised Footrope Trawl Fishery

