3.7 Alternatives to Minimize the Adverse Effects of Fishing on Essential Fish Habitat

The 1996 Amendments to the MSA require that FMPs minimize, to the extent practicable, adverse effects on EFH caused by fishing (MSA section 303(a)(7)). Additionally, based on the federal court order regarding the National Environmental Policy Act (NEPA) requirements of the Council's Omnibus EFH Amendment (AOC v. Daley, September 14, 2000), the following is a list of proposed habitat-related management measures, which are included in the supplemental environmental impact statement (SEIS) prepared for Amendment 13 to the Multispecies FMP. The actions included in this amendment represent some of those received by NMFS and the Council during scoping for Amendment 13, as well as other alternatives developed in an effort to assist the Council comply with the AOC v. Daley court order.

3.7.1 Benefits to Essential Fish Habitat of Other Amendment 13 Alternatives (Alternative 2)

Some of the non-habitat-related management measures in Amendment 13 are likely to provide benefits to essential fish habitat in the region. This alternative will rely on the habitat benefits of other non-habitat management measures that are implemented in Amendment 13 to meet the EFH provisions of the MSA. Depending on which measures are adopted, those benefits may or may not satisfy the EFH provisions of the MSA. Table 15 summarizes the expected habitat benefits of the proposed non-habitat management measures that are being considered by the Council in Amendment 13.

3.7.2 Expand list of gears prohibited in closed areas (Alternative 7)

This alternative will expand the list of fishing gears prohibited from use in the year-round closed areas to include clam dredges. This gear is allowed in portions of the existing groundfish closed areas and, due to their impacts, excluding their use may better protect essential fish habitat.

Alternative	Overall Habitat Impact	Feature	Description of Habitat Impact
US/Canada Resource Sharing Agreement	Negative Impact (-)	Adoption of understanding with hard TACs for cod, haddock, and yellowtail flounder with incentives for participation	This area is primarily sand and gravelly sand. About half of this relatively small access area is deep undisturbed bottom with a high cover of emergent epifauna (Collie et al., 2000).
Observer Coverage	Indirect benefits (+)	10% requested by 2006 for each gear type	If observers are able to collect data of interest to EFH management, increased coverage could indirectly benefit habitat.
Alternatives to Control Capacity	Positive Impact (+)	DAS can be transferred with restrictions and new measures for "reserve days"	Any measure that is intended to reduce the amount of time fishing by mobile gear will likely have benefits to EFH. These measures reduce amount of latent effort as well.
Management Measures to Address Rebuilding Requirements	Overall Positive Impact (+)	Mix of adaptive and phased reduction strategies. Provides opportunity to fish on stocks that do not need rebuilding	The effort reductions, year-round closed areas, and existing gear modifications are likely to have positive impacts on EFH.
Effort Controls	Positive Impact (+)	A days (60% of effective effort) B days (40% of effective effort) C days (FY01 allocation)	Reducing DAS will likely benefit EFH by reducing the amount of time vessels can fish. There are studies that document the recovery of benthic habitats following the cessation of bottom fishing.
Closed Areas	Positive Impact (+)	Addition of Cashes as a year round closure	Year-round closures provide habitat benefits to the areas within the closures. The addition of Cashes Ledge as a year-round closure will benefit the EFH and rare kelp beds found in that area.

Table 15 – Summary of the potential habitat benefits of non-habitat measures proposed in Amendment 13.
Note: Seasonal (rolling) closures, possession limits, and hard TACs that are included in a number of proposed management measures are not considered to provide any significant habitat benefits. Habitat benefits identified above apply primarily to bottom trawls, not to fixed gear such as hooks and gill nets

3.7.3 Habitat Alternative 10, Option (b) – Compromise Habitat Closure Areas

The Council selected Habitat Alternative 10, Option (b) to implement under Amendment 13 to the Northeast Multispecies FMP to minimize the adverse impacts of fishing as demonstrated in the Adverse Impact Determination section.

This action identifies several areas as habitat closures. These areas are a Level III habitat closure, with one exception, shrimp trawls are allowed in the WGOM closed area (see the description of Levels for habitat closures in Section 3.7.4). This alternative was developed to incorporate areas that would benefit EFH, but not in the most productive fishing grounds currently available to fishermen. Both existing mortality closures and proposed habitat closures were modified to develop one alternative that closes sensitive habitat. It is important to note that these modifications are for habitat closures only; none of the habitat alternatives adjust boundaries of groundfish mortality closed areas. In general, the alternatives suggest changing the eastern boundary of the Western Gulf of Maine closure for habitat purposes, and modifying the Nantucket Lightship closure for habitat purposes. In addition, the access areas used in

Framework 13 for Closed Area I were modified slightly as habitat closed areas. Lastly, the habitat closure proposals for Closed Area II, Jeffrey's, Bank, and Cashes Ledge were included in this alternative, with some modifications.

These modifications were suggested for different reasons. Specifically, the boundaries within Closed Area I for the FW13 access program were modified to protect better spawning grounds for Cod (open area shifted to the South). The proposed habitat closure for the Western Gulf of Maine (in Alternatives 3a, 3b, and 4) was modified to include the complex bottom that is found along the western border of the closure. The areas on Cashes Ledge and Jeffrey's Ledge that have been proposed for habitat closures in Habitat Alternatives 3a, 3b, and 4 were recommended as well, with a modification to the southern boundary of the Cashes habitat closure. This recommendation was primarily for enforcement reasons, and this area is deeper, so does not contain the rare kelp beds that are contained on Cashes Ledge. The modification to the Nantucket Lightship closure was recommended to include more complex bottom and small fish that are found north of the existing boundaries, rather than the areas in the western and eastern portion of the closure. Overall, the main intent of this alternative is to protect EFH through long term closed areas, but at the same time it recognizes that access to primary fishing grounds is important as well.

Detailed justification of each closed area modification:

Closed Area I (CAI) - According to industry, Closed Area I is very beneficial for rebuilding haddock and may be the primary reason haddock are recovering today. However, CAI does not provide much benefit for cod. Much of CAI is sand, however, there are diverse sediment types scattered within the area. The southeastern portion of CAI was contains the much of the complex bottom in the closed area. The northern part of the Framework 13 scallop access area in the middle of CAI has important habitat for cod spawning. As such, the Framework 13 scallop access area was shifted southward so that the cod could gain protection in the north for spawning, and the scallop resource would be accessible in the closed area. Both option (a) and (b) include the modified version of the Closed Area I as a habitat closure.

Closed Area II (CAII) – The habitat closed area was defined as the boundaries of the existing cod HAPC. From Amendment 11 to the Northeast Multispecies FMP, the following justification was provided for the designation of the existing cod HAPC:

"Several sources document the importance of gravel/cobble substrate to the survival of newly settled juvenile cod (Lough et al. 1989; Valentine and Lough 1991; Gotceitas and Brown 1993; Tupper and Boutilier 1995; Valentine and Schmuck 1995). A substrate of gravel or cobble allows sufficient space for newly settled juvenile cod to find shelter and avoid predation (Lough et al. 1989; Valentine and Lough 1991; Gotceitas and Brown 1993; Tupper and Boutilier 1995; Valentine and Schmuck 1995). Particular life history stages or transitions are sometimes considered "ecological bottlenecks" if there are extremely high levels of mortality associated with the life history stage or transition. Extremely high mortality rates attendant to post-settlement juvenile cod are attributed to high levels of predation (Tupper and Boutilier 1995). Increasing the availability of suitable habitat for post-settlement juvenile cod could ease the bottleneck, increasing juvenile survivorship and recruitment into the fishery. For these reasons, areas with a gravel/cobble substrate meet the first criterion for habitat areas of particular concern.

Specific areas on the northern edge of Georges Bank have been extensively studied and identified as important areas for the survival of juvenile cod (Lough et al. 1989; Valentine and Lough 1991; Valentine and Schmuck 1995). These studies provide reliable information on the location of the areas most important to juvenile cod and the type of substrate found in those areas. These areas have also been studied to determine the effects of bottom fishing on the benthic megafauna (Collie et al. 1996; Collie et al. 1997). Gravel/cobble substrates not subject to fishing pressure support thick colonies of emergent epifauna, but bottom fishing, especially scallop dredging, reduces habitat complexity and removes much

of the emergent epifauna (Collie et al. 1996; Collie et al. 1997). Acknowledging that a single tow of a dredge across pristine habitat will have few long-term effects, Collie et al. (1997) focus on the cumulative effects and intensity of trawling and dredging as responsible for potential long-term changes in benthic communities. For these reasons, the identified area on the northern edge of Georges Bank meets the second criterion, as well as the cumulative effects consideration, for designation as a habitat area of particular concern.

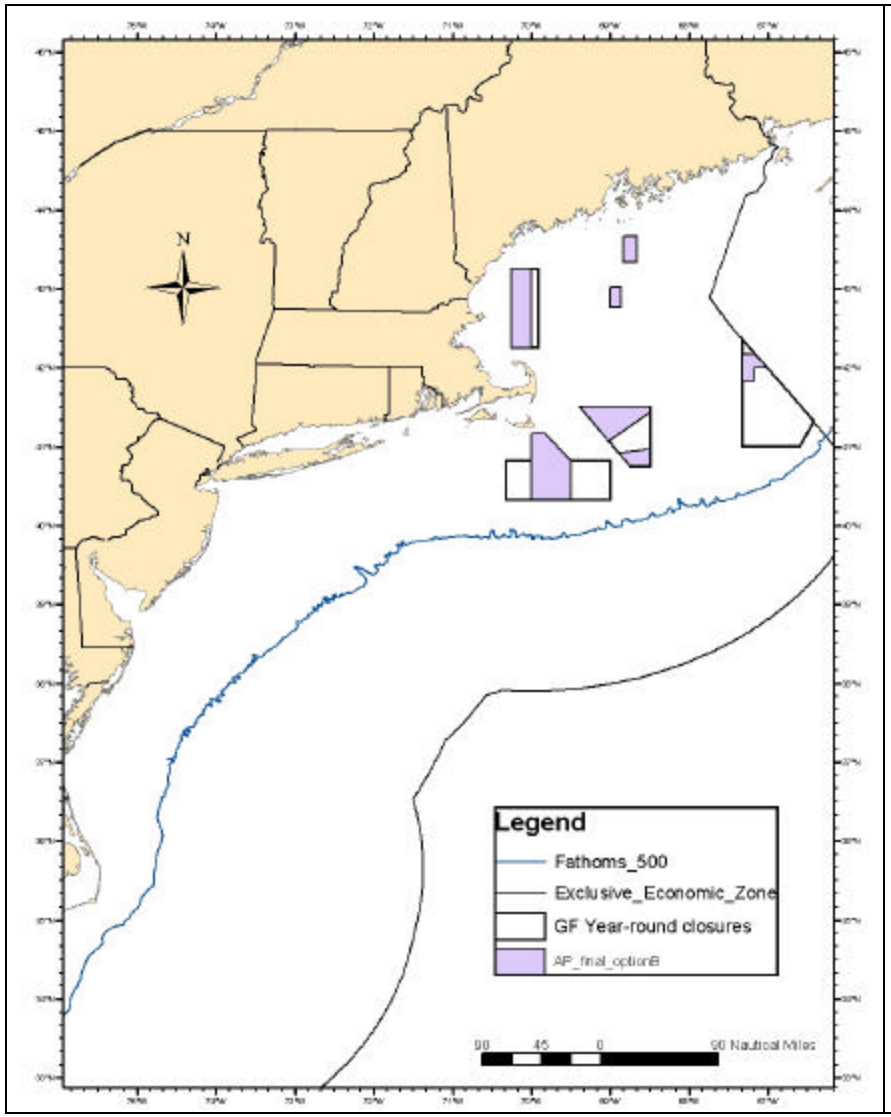
Collie et al. (1997) also describe the relative abundance of several other species such as shrimps, polychaetes, brittle stars, and mussels in the undisturbed sites. These species are found in association with the emergent epifauna (bryozoans, hydroids, worm tubes) prevalent in the undisturbed areas. Several studies of the food habits of juvenile cod identify these associated species as important prey items (Hacunda 1981; Lilly and Parsons 1991; Witman and Sebens 1992; Casas and Paz 1994; NEFSC 1998). These areas provide two important ecological functions for post-settlement juvenile cod relative to other areas: increased survivability and readily available prey. These areas are also particularly vulnerable to adverse impacts from mobile fishing gear."

Western Gulf of Maine Closed Area (WGOM) - The new boundaries proposed in some of the habitat alternatives seem hard to enforce, and the industry would not gain much from the areas that would open. Modify the proposed habitat closure for the WGOM by the eastern boundary to come straight down the 70°W line instead of the irregular boundary proposed in habitat alternatives 3a, 3b, and 4. The main rationale behind this modification is that the closed area would be easier to enforce and there are resources in the eastern portion of the closure that should be available to fishermen. Furthermore, the important areas for habitat are along the western boundary. If all the deep areas are closed to fishing then there is no where to go to avoid cod bycatch. It was also pointed out that this area is close to Gloucester, and this port depends on this area heavily. Both option (a) and (b) include the modified version of the WGOM as a habitat closure. The shrimp season has been short in recent years: 1998-1999 (40 DAS), 2000-2001 (61 DAS), 2001-2002 (25 DAS), 2002-2003 (38 DAS). Therefore, the extent and duration of the impact to EFH from shrimp trawling is minimal.

Nantucket Lightship Closed Area (NLCA) - Anecdotally, the substrate in the Nantucket Shoals is very complex. As such, this area has diverse sediment types and is important for the protection of small fish. An extension of the area north of the Nantucket Lightship would be closed primarily to protect the habitats on which small fish depend. A benthos map completed roughly in the 1960s showed that most of the concentrations of benthos in this area were contained in the central portion of the Nantucket Lightship area. Although this area is mostly sand, it contains many species. The modifications to include the central portion and an extension to the north contain a diversity of sediments and species. Both option (a) and (b) include the modified version of the NLCA as a habitat closure.

Cashes Ledge Closed Area - the closure should be modified to the 42°45W line. The southern boundary should be moved up, because the deeper area to the south does not contain kelp and should be assessable for fishing. Both option (a) and (b) include the modified version of the Cashes Ledge Closure as a habitat closure.

Jeffreys Ledge Closed Area - Both option (a) and (b) include the version contained in Alternative 3 (a) and (b) of the Jeffrey's Ledge Closed Area as a habitat closure.



Coordinates for 10b				
	Longitude (Deg, Min)		Latitude (Deg, Min)	
Closed Area II	67	20	42	10
	67	9.3	42	10
	67	0.5	42	0
	67	10	42	0
	67	10	41	50
	67	20	41	50
WGOM	70	15	43	15
	70	0	43	15
	70	0	42	15
	70	15	42	15
Cashes	69	3.22	43	1.14
	68	51.56	43	1.14
	68	51.56	42	45
	69	3.22	42	45
Jeffreys	68	50	43	40
	68	40	43	40
	68	40	43	20
	68	50	43	20
Nantucket	70	0	41	10
	69	50	41	10
	69	30	40	50
	69	30	40	20
	70	0	40	20
Closed Area I	69	22.8	41	30
	68	30	41	30
	68	30	41	26
	69	1	41	4
Closed Area I	68	53	40	55
	68	30	40	58
	68	30	40	45
	68	45	40	45

Figure 11 Proposed habitat closures (Alternative 10b)

3.7.4 Options for Levels of Habitat Area Closure

Four levels of Habitat Closures were approved by the Council as a basis for determining appropriate gear types for habitat closure areas. These levels apply to the closed area alternatives that follow. It is possible that a closure level could be applied to all closed areas, or that closure levels be assigned specifically to each habitat closed area. Bottom tending mobile gear is defined as the following gears: hydraulic clam dredges, quahog dredge, scallop dredge, otter trawls (shrimp, scallop, fish, crab), beam trawls, sea urchin dredges and Danish/Scottish seines. Bottom tending static gear is defined as the following gears: lobster pots, fish pots, crab pots, sink and stake gillnets, and bottom longlines.

Level 1 Habitat Closure: The area will be closed indefinitely on a year round basis to all fishing gear.

This is the most restrictive option. This level would essentially establish a no-take marine protected area and would prohibit the use of all types of fishing gear in these closures. This level of closure would close the area to all fishing gear, both commercial and recreational.

Level 2 Habitat Closure: The area will be closed indefinitely on a year round basis to all bottom tending gear (static and mobile).

This option is slightly less restrictive than the Level 1 closure because it allows non-bottom-tending gear to operate in the habitat closures. Because is does prohibit all bottom tending gear, it will protect EFH for benthic species and life stages to the same degree as a Level 1 closure. The differences between Level 1 and Level 2 closures are primarily social and economic. Refer to Section **9.3.1.2** for a discussion of the impacts of both mobile and static gear on benthic habitats.

Level 3 Habitat Closure: The area will be closed indefinitely on a year round basis to all bottom tending mobile gear.

This level of closure is less restrictive because it allows static bottom tending gear to operate in these closures, but prohibits bottom tending mobile gears. Although less restrictive than Levels 1 and 2, the effects of this level of closure on benthic habitats do not differ significantly from the effects of Level 1 or 2 closures since static gear is generally considered to have minimal adverse impacts on benthic habitat (see section **9.3.1.2**).

Level 4 Habitat Closure: The area will be open indefinitely on a year round basis only to gear defined as "reduced impact" gear.

Currently there are no reduced impact gear types defined by the Council. The identification of "reduced impact gear" would begin by first defining the ecological function served by the closure, with the advice from the Habitat Technical Team.

The analysis of this option is difficult because it requires knowledge of the individual ecological functions or features that the Council intends to protect. It is feasible that a Level 4 closure could apply to subsets of habitat closures depending on the intention of the closure. The implementation of this option will require a scientific and technical review procedure that includes, at a minimum, the Habitat Committee and the EFH Technical Team. If this level of closure is recommended, a process similar to the Council's HAPC designation process (See the Council's Habitat Annual Review and Report of 2000 for details) is recommended.

Summary of Level of Closures:

Because the effects of fishing on benthic habitats are caused primarily by mobile bottom-tending gears (bottom trawls and dredges), much less so by static bottom-tending gear (*e.g.*, pots, bottom longlines and gill nets), and not at all by pelagic gears (*e.g.*, mid-water trawls), the habitat metric analyses performed in this amendment/DEIS would apply equally well to Level 1 and Level 2 closures and nearly as well to Level 3 closures. Analysis of Level 4 closures would have to be tailored to the effects of specific "reduced impact" gears on specific habitat types. Economic and social impact assessments that were performed as part of the Practicability Analysis (Section 5.6), as well as assessments of enforcement feasibility and cumulative impacts were conducted for Level 1 and Level 3 closures in order to better distinguish between the impacts of these two closure levels.

None of the proposed habitat closures in this amendment specify which gear types would be prohibited. The Council will make those determinations when it decides whether an area closure is needed in order to minimize the adverse impacts of groundfish fishing on EFH. In implementing a habitat closed area alternative, the Council could prohibit the use of mobile, bottom-tending gear types while allowing the use of pelagic gears (Level 2) or pelagic and fixed bottom-tending gear (Level 3) based on practicability issues. If future closure alternatives are proposed for reasons other than the minimization of fishing impacts identified in this document (e.g. research areas, coral protection, etc.), other closure levels may be appropriate.

3.8 Other Issues

3.8.1 Elimination of the Area Restriction for the Northern Shrimp Fishery

The northern shrimp fishery will no longer be restricted to the area shoreward of the small mesh fishery exemption line by the Northeast Multispecies FMP. All other restrictions (for example, the requirement to use a Nordmore grate, restrictions on incidental catch, prohibition on fishing in some year round closed areas, etc.) remain in effect. The small mesh fishery exemption line will be retained in the regulations because it is used for other reasons, but it will no longer apply to the northern shrimp fishery.

Small Mesh Northern Shrimp Fishery Exemption Area

Point	N. Lat.	W. Long.
SM1	41º 35'	70º 00'
SM2	41º 35'	69º 40'
SM3	42º 49.5'	69º 40'
SM4	43º 12'	69º 00'
SM5	43º 41'	68º 00'
G2	43º 58'	67º 22'; (the U.S.-Canada maritime Boundary).
G1	Northward along the irregular U.S.-Canada maritime boundary to the shoreline.	