

## 10.0 References

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## 10.2 Glossary

**Adult stage:** One of several marked phases or periods in the development and growth of many animals. In vertebrates, the life history stage where the animal is capable of reproducing, as opposed to the juvenile stage.

**Adverse effect:** Any impact that reduces quality and/or quantity of EFH. May include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include sites-specific or habitat wide impacts, including individual, cumulative, or synergistic consequences of actions.

**Aggregation:** A group of animals or plants occurring together in a particular location or region.

**Anadromous species:** fish that spawn in fresh or estuarine waters and migrate to ocean waters

**Amphipods:** A small crustacean of the order Amphipoda, such as the beach flea, having a laterally compressed body with no carapace.

**Anaerobic sediment:** Sediment characterized by the absence of free oxygen.

**Anemones:** Any of numerous flowerlike marine coelenterates of the class Anthozoa, having a flexible cylindrical body and tentacles surrounding a central mouth.

**Annual total mortality:** Rate of death expressed as the fraction of a cohort dying over a period compared to the number alive at the beginning of the period ( $\#$  total deaths during year / numbers alive at the beginning of the year). Optimists convert death rates into annual survival rate using the relationship  $S=1-A$ .

**ASPIC (A Surplus Production Model Incorporating Covariates):** A non-equilibrium surplus production model developed by Prager (1995). ASPIC was frequently used by the Overfishing Definition Panel to define  $B_{MSY}$  and  $F_{MSY}$  reference points. The model output was also used to estimate rebuilding timeframes for the Amendment 9 control rules.

**Bay:** An inlet of the sea or other body of water usually smaller than a gulf; a small body of water set off from the main body; e.g. Ipswich Bay in the Gulf of Maine.

**Benthic community:** *Benthic* means the bottom habitat of the ocean, and can mean anything as shallow as a salt marsh or the intertidal zone, to areas of the bottom that are several miles deep in the ocean. *Benthic community* refers to those organisms that live in and on the bottom. (*In* meaning they live within the substrate; e.g, within the sand or mud found on the bottom. See *Benthic infauna*, below)

**Benthic infauna:** See *Benthic community*, above. Those organisms that live *in* the bottom sediments (sand, mud, gravel, etc.) of the ocean. As opposed to *benthic epifauna*, that live *on* the surface of the bottom sediments.

**Benthivore:** Usually refers to fish that feed on benthic or bottom dwelling organisms.

**Berm:** A narrow ledge typically at the top or bottom of a slope; e.g. a berm paralleling the shoreline caused by wave action on a sloping beach; also an elongated mound or wall of earth.

**Biogenic habitats:** Ocean habitats whose physical structure is created or produced by the animals themselves; e.g, coral reefs.

**Biomass:** The total mass of living matter in a given unit area or the weight of a fish stock or portion thereof. Biomass can be listed for beginning of year (Jan-1), Mid-Year, or mean (average during the entire year). In addition, biomass can be listed by age group (numbers at age \* average weight at age) or summarized by groupings (e.g., age 1<sup>+</sup>, ages 4+ 5, etc). See also spawning stock biomass, exploitable biomass, and mean biomass.

**B<sub>MSY</sub>:** The stock biomass that would produce MSY when fished at a fishing mortality rate equal to F<sub>MSY</sub>. For most stocks, B<sub>MSY</sub> is about ½ of the carrying capacity. The proposed overfishing definition control rules call for action when biomass is below ¼ or ½ B<sub>MSY</sub>, depending on the species.

**B<sub>threshold</sub>:** 1) A limit reference point for biomass that defines an unacceptably low biomass i.e., puts a stock at high risk (recruitment failure, depensation, collapse, reduced long term yields, etc). 2) A biomass threshold that the SFA requires for defining when a stock is overfished. A stock is overfished if its biomass is below B<sub>threshold</sub>. A determination of overfished triggers the SFA requirement for a rebuilding plan to achieve B<sub>target</sub> as soon as possible, usually not to exceed 10 years except certain requirements are met. In Amendment 9 control rules, B<sub>threshold</sub> is often defined as either 1/2B<sub>MSY</sub> or 1/4 B<sub>MSY</sub>. B<sub>threshold</sub> is also known as B<sub>minimum</sub>.

**B<sub>target</sub>:** A desirable biomass to maintain fishery stocks. This is usually synonymous with B<sub>MSY</sub> or its proxy.

**Biomass weighted F:** A measure of fishing mortality that is defined as an average of fishing mortality at age weighted by biomass at age for a ranges of ages within the stock (e.g., ages 1<sup>+</sup> biomass weighted F is a weighted average of the mortality for ages 1 and older, age 3<sup>+</sup> biomass weighted is a weighted average for ages 3 and older). Biomass weighted F can also be calculated using catch in weight over mean biomass. See also fully-recruited F.

**Biota:** All the plant and animal life of a particular region.

**Bivalve:** A class of mollusks having a soft body with platelike gills enclosed within two shells hinged together; e.g., clams, mussels.

**Bottom roughness:** The inequalities, ridges, or projections on the surface of the seabed that are caused by the presence of bedforms, sedimentary structures, sedimentary particles, excavations, attached and unattached organisms, or other objects; generally small scale features.

**Bottom tending mobile gear:** All fishing gear that operates on or near the ocean bottom that is actively worked in order to capture fish or other marine species. Some examples of bottom tending mobile gear are otter trawls and dredges.

**Bottom tending static gear:** All fishing gear that operates on or near the ocean bottom that is not actively worked; instead, the effectiveness of this gear depends on species moving to the gear which is set in a particular manner by a vessel, and later retrieved. Some examples of bottom tending static gear are gillnets, traps, and pots.

**Boulder reef:** An elongated feature (a chain) of rocks (generally piled boulders) on the seabed.

**Bryozoans:** Phylum aquatic organisms, living for the most part in colonies of interconnected individuals. A few to many millions of these individuals may form one colony. Some bryozoans encrust rocky surfaces, shells, or algae others form lacy or fan-like colonies that in some regions may form an abundant component of limestones. Bryozoan colonies range from millimeters to meters in size, but the individuals that make up the colonies are rarely larger than a millimeter. Colonies may be mistaken for hydroids, corals or seaweed.

**Burrow:** A hole or excavation in the sea floor made by an animal (as a crab, lobster, fish, burrowing anemone) for shelter and habitation.

**Bycatch:** (v.) the capture of nontarget species in directed fisheries which occurs because fishing gear and methods are not selective enough to catch only target species; (n.) fish which are harvested in a fishery but are not sold or kept for personal use, including economic discards and regulatory discards but not fish released alive under a recreational catch and release fishery management program.

**Capacity:** the level of output a fishing fleet is able to produce given specified conditions and constraints. Maximum fishing capacity results when all fishing capital is applied over the maximum amount of available (or permitted) fishing time, assuming that all variable inputs are utilized efficiently.

**Catch:** The sum total of fish killed in a fishery in a given period. Catch is given in either weight or number of fish and may include landings, unreported landings, discards, and incidental deaths.

**Closed Area Model (CAM):** A General Algebraic Modeling System (GAMS) model used to evaluate the effectiveness of effort controls used in the Northeast Multispecies Fishery. Using catch data from vessels in the fishery, the model estimates changes in exploitation that may result from changes in DAS, closed areas, and possession limits. These changes in exploitation are then converted to changes in fishing mortality to evaluate proposed measures.

**Coarse sediment:** Sediment generally of the sand and gravel classes; not sediment composed primarily of mud; but the meaning depends on the context, e.g. within the mud class, silt is coarser than clay.

**Commensalism:** See *Mutualism*. An interactive association of two species where one benefits in some way, while the other species is in no way affected by the association.

**Continental shelf waters:** The waters overlying the continental shelf, which extends seaward from the shoreline and deepens gradually to the point where the sea floor begins a slightly steeper descent to the deep ocean floor; the depth of the shelf edge varies, but is approximately 200 meters in many regions.

**Control rule:** A pre-determined method for determining fishing mortality rates based on the relationship of current stock biomass to a biomass target. Amendment 9 overfishing control rules define a target biomass ( $B_{MSY}$  or proxy) as a management objective. The biomass threshold ( $B_{threshold}$  or  $B_{min}$ ) defines a minimum biomass below which a stock is considered overfished.

**Cohort:** see yearclass.

**Crustaceans:** Invertebrates characterized by a hard outer shell and jointed appendages and bodies. They usually live in water and breathe through gills. Higher forms of this class include lobsters, shrimp and crawfish; lower forms include barnacles.

**Data Poor Working Group (DPWG):** A standing assessment panel assembled to address stocks with limited or poor data. Two reports have been prepared as of the submission of this document.

**Days absent:** an estimate by port agents of trip length. This data was collected as part of the NMFS weighout system prior to May 1, 1994.

**Days-at-sea (DAS):** the total days, including steaming time that a boat spends at sea to fish. Amendment 13 categorized DAS for the multispecies fishery into three categories, based on each individual vessel's fishing history during the period fishing year 1996 through 2001. The three categories are: Category A: can be used to target any groundfish stock; Category B: can only be used to target healthy stocks; Category C: cannot be used until some point in the future. Category B DAS are further divided equally into Category B (regular) and Category B (reserve).

**DAS "flip":** A practice in the Multispecies FMP that occurs when a vessel fishing on a Category B (regular) DAS must change ("flip") its DAS to a Category A DAS because it has exceeded a catch limit for a stock of concern.

**Demersal species:** Most often refers to fish that live on or near the ocean bottom. They are often called benthic fish, groundfish, or bottom fish.

**Diatoms:** Small mobile plants (algæ) with silicified (silica, sand, quartz) skeletons. They are among the most abundant phytoplankton in cold waters, and an important part of the food chain.

**Discards:** animals returned to sea after being caught; see Bycatch (n.)

**Dissolved nutrients:** Non-solid nutrients found in a liquid.

**Echinoderms:** A member of the Phylum Echinodermata. Marine animals usually characterized by a five-fold symmetry, and possessing an internal skeleton of calcite plates, and a complex water vascular system. Includes echinoids (sea urchins), crinoids (sea lillies) and asteroids (starfish).

**Ecosystem-based management:** a management approach that takes major ecosystem components and services—both structural and functional—into account, often with a multispecies or habitat perspective

**Egg stage:** One of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that occurs after reproduction and refers to the developing embryo, its food store, and sometimes jelly or albumen, all surrounded by an outer shell or membrane. Occurs before the *larval* or *juvenile stage*.

**Elasmobranch:** Any of numerous fishes of the class Chondrichthyes characterized by a cartilaginous skeleton and placoid scales: sharks; rays; skates.

**Embayment:** A bay or an indentation in a coastline resembling a bay.

**Emergent epifauna:** See *Epifauna*. Animals living upon the bottom that extend a certain distance above the surface.

**Epifauna:** See *Benthic infauna*. *Epifauna* are animals that live on the surface of the substrate, and are often associated with surface structures such as rocks, shells, vegetation, or colonies of other animals.

**Essential Fish Habitat (EFH):** Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The EFH designation for most managed species in this region is based on a legal text definition and geographical area that are described in the Habitat Omnibus Amendment (1998).

**Estuarine area:** The area of an estuary and its margins; an area characterized by environments resulting from the mixing of river and sea water.

**Estuary:** A water passage where the tide meets a river current; especially an arm of the sea at the lower end of a river; characterized by an environment where the mixing of river and seawater causes marked variations in salinity and temperature in a relatively small area.

**Eutrophication:** A set of physical, chemical, and biological changes brought about when excessive nutrients are released into the water.

**Euphotic zone:** The zone in the water column where at least 1% of the incident light at the surface penetrates.

**Exclusive Economic Zone (EEZ):** a zone in which the inner boundary is a line coterminous with the seaward boundary of each of the coastal States and the outer boundary is line 200 miles away and parallel to the inner boundary

**Exempt fisheries:** Any fishery determined by the Regional Director to have less than 5 percent regulated species as a bycatch (by weight) of total catch according to 50 CFR 648.80(a)(7).

**Exploitable biomass:** The biomass of fish in the portion of the population that is vulnerable to fishing.

**Exploitation pattern:** Describes the fishing mortality at age as a proportion of fully recruited  $F$  (full vulnerability to the fishery). Ages that are fully vulnerable experience 100% of the fully recruited  $F$  and are termed fully recruited. Ages that are only partially vulnerable experience a fraction of the fully recruited  $F$  and are termed partially recruited. Ages that are not vulnerable to the fishery (including discards) experience no mortality and are considered pre-recruits. Also known as the partial recruitment pattern, partial recruitment vector or fishery selectivity.

**Exploitation rate ( $u$ ):** The fraction of fish in the exploitable population killed during the year by fishing. This is an annual rate compared to  $F$ , which is an instantaneous rate. For example, if a population has 1,000,000 fish large enough to be caught and 550,000 are caught (landed and discarded) then the exploitation rate is 55%.

**Fathom:** A measure of length, containing six feet; the space to which a man can extend his arms; used chiefly in measuring cables, cordage, and the depth of navigable water by soundings.

**Fishing mortality ( $F$ ):** A measurement of the rate of removal of fish from a population caused by fishing. This is usually expressed as an instantaneous rate ( $F$ ) and is the rate at which fish are harvested at any given point in a year. Instantaneous fishing mortality rates can be either fully recruited or biomass weighted. Fishing mortality can also be expressed as an exploitation rate (see exploitation rate) or less commonly, as a conditional rate of fishing mortality ( $m$ , fraction of fish removed during the year if no other competing sources of mortality occurred. Lower case  $m$  should not be confused with upper case  $M$ , the instantaneous rate of natural mortality).

**$F_{0.1}$ :** a conservative fishing mortality rate calculated as the  $F$  associated with 10 percent of the slope at origin of the yield-per-recruit curve.

**$F_{MAX}$ :** a fishing mortality rate that maximizes yield per recruit.  $F_{MAX}$  is less conservative than  $F_{0.1}$ .

**$F_{MSY}$ :** a fishing mortality rate that would produce MSY when the stock biomass is sufficient for producing MSY on a continuing basis.

**$F_{threshold}$ :** 1) The maximum fishing mortality rate allowed on a stock and used to define overfishing for status determination. Amendment 9 frequently uses  $F_{MSY}$  or  $F_{MSY}$  proxy for  $F_{threshold}$ . 2) The maximum fishing mortality rate allowed for a given biomass as defined by a control rule.

**Fishing effort:** the amount of time and fishing power used to harvest fish. Fishing power is a function of gear size, boat size and horsepower.

**Framework adjustments:** adjustments within a range of measures previously specified in a fishery management plan (FMP). A change usually can be made more quickly and easily by a framework adjustment than through an amendment. For plans developed by the New England Council, the procedure requires at least two Council meetings including at least one public hearing and an evaluation of environmental impacts not already analyzed as part of the FMP.

**Furrow:** A trench in the earth made by a plow; something that resembles the track of a plow, as a marked narrow depression; a groove with raised edges.

**GARM:** The monstrous hound Garm guards the entrance to Helheim, the Norse realm of the dead. It has four eyes and a chest drenched with blood. Also: **Groundfish Assessment Review Meeting;** peer reviewed assessment of groundfish stock managed by the Northeast Multispecies Fishery Management Plan. There have been three GARM cycles. GARM III was a series of four peer reviewed meetings held in 2007 and 2008. The final meeting evaluated stock status and provides the scientific basis for this management action.

**Glacial moraine:** A sedimentary feature deposited from glacial ice; characteristically composed of unsorted clay, sand, and gravel. Moraines typically are hummocky or ridge-shaped and are located along the sides and at the fronts of glaciers.

**Glacial till:** Unsorted sediment (clay, sand, and gravel mixtures) deposited from glacial ice.

**Grain size:** the size of individual sediment particles that form a sediment deposit; particles are separated into size classes (e.g. very fine sand, fine sand, medium sand, among others); the classes are combined into broader categories of mud, sand, and gravel; a sediment deposit can be composed of few to many different grain sizes.

**Growth overfishing:** Fishing at an exploitation rate or at an age at entry that reduces potential yields from a cohort but does not reduce reproductive output (see recruitment overfishing).

**Halocline:** The zone of the ocean in which salinity increases rapidly with depth.

**Habitat complexity:** Describes or measures a habitat in terms of the variability of its characteristics and its functions, which can be biological, geological, or physical in nature. Refers to how complex the physical structure of the habitat is. A bottom habitat with *structure-forming organisms*, along with other three dimensional objects such as boulders, is more complex than a flat, featureless, bottom.

**Highly migratory species:** tuna species, marlin, oceanic sharks, sailfishes, and swordfish

**Hydroids:** Generally, animals of the Phylum Cnidaria, Class Hydrozoa; most hydroids are bush-like polyps growing on the bottom and feed on plankton, they reproduce asexually and sexually.

**Immobile epifaunal species:** See *epifauna*. Animals living on the surface of the bottom substrate that, for the most part, remain in one place.

**Individual Fishing Quota (IFQ):** federal permit under a limited access system to harvest a quantity of fish, expressed by a unit or units representing a percentage of the total allowable catch of a fishery that may be received or held for exclusive use by an individual person or entity

**Juvenile stage:** One of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that comes between the *egg* or *larval stage* and the *adult stage*; juveniles are considered immature in the sense that they are not yet capable of reproducing, yet they differ from the larval stage because they look like smaller versions of the adults.

**Landings:** The portion of the catch that is harvested for personal use or sold.

**Land runoff:** The part of precipitation, snowmelt, or irrigation water that reaches streams (and thence the sea) by flowing over the ground, or the portion of rain or snow that does not percolate into the ground and is discharged into streams instead.

**Larvae stage:** One of several marked phases or periods in the development and growth of many animals. The first stage of development after hatching from the *egg* for many fish and invertebrates. This life stage looks fundamentally different than the juvenile and adult stages, and is incapable of reproduction; it must undergo metamorphosis into the juvenile or adult shape or form.

**Lethrinids:** Fish of the genus *Lethrinus*, commonly called emperors or nor'west snapper, are found mainly in Australia's northern tropical waters. Distinctive features of Lethrinids include thick lips, robust canine teeth at the front of the jaws, molar-like teeth at the side of the jaws and cheeks without scales. Lethrinids are carnivorous bottom-feeding fish with large, strong jaws.

**Limited-access permits:** permits issued to vessels that met certain qualification criteria by a specified date (the "control date").

**Lutjanids:** Fish of the genus of the Lutjanidae: snappers. Marine; rarely estuarine. Some species do enter freshwater for feeding. Tropical and subtropical: Atlantic, Indian and Pacific Oceans.

**Macrobenthos:** See *Benthic community* and *Benthic infauna*. Benthic organisms whose shortest dimension is greater than or equal to 0.5 mm.

**Maturity ogive:** A mathematical model used to describe the proportion mature at age for the entire population.  $A_{50}$  is the age where 50% of the fish are mature.

**Mean biomass:** The average number of fish within an age group alive during a year multiplied by average weight at age of that age group. The average number of fish during the year is a function of starting stock size and mortality rate occurring during the year. Mean biomass can be aggregated over several ages to describe mean biomass for the stock. For example the mean

biomass summed for ages 1 and over is the  $1^+$  mean biomass; mean biomass summed across ages 3 and over is  $3^+$  mean biomass.

**Megafaunal species:** The component of the fauna of a region that comprises the larger animals, sometimes defined as those weighing more than 100 pounds.

**Mesh selectivity ogive:** A mathematical model used to describe the selectivity of a mesh size (proportion of fish at a specific length retained by mesh) for the entire population.  $L_{25}$  is the length where 25% of the fish encountered are retained by the mesh.  $L_{50}$  is the length where 50% of the fish encountered are retained by the mesh.

**Meter:** A measure of length, equal to 39.37 English inches, the standard of linear measure in the metric system of weights and measures. It was intended to be, and is very nearly, the ten millionth part of the distance from the equator to the north pole, as ascertained by actual measurement of an arc of a meridian.

**Metric ton:** A unit of weight equal to a thousand kilograms (1kgs = 2.2 lbs.). A metric ton is equivalent to 2,205 lbs. A thousand metric tons is equivalent to 2.2 million lbs.

**Microalgal:** Small microscopic types of algae such as the green algae.

**Microbial:** Microbial means of or relating to microorganisms.

**Minimum spawning stock threshold:** the minimum spawning stock size (or biomass) below which there is a significantly lower chance that the stock will produce enough new fish to sustain itself over the long term.

**Mobile organisms:** organisms that are not confined or attached to one area or place, that can move on their own, are capable of movement, or are moved (often passively) by the action of the physical environment (waves, currents, etc.).

**Molluscs:** Common term for animals of the phylum Mollusca. Includes groups such as the bivalves (mussels, oysters etc.), cephalopods (squid, octopus etc.) and gastropods (abalone, snails). Over 80,000 species in total with fossils back to the Cambrian period.

**Mortality:** see Annual total mortality (A), Exploitation rate (u), Fishing mortality (F), Natural mortality (M), and instantaneous total mortality (Z).

**Motile:** Capable of self-propelled movement. A term that is sometimes used to distinguish between certain types of organisms found in water.

**Multispecies:** the group of species managed under the Northeast Multispecies Fishery Management Plan. This group includes whiting, red hake and ocean pout plus the regulated species (cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish).

**Mutualism:** See *Commensalism*. A symbiotic interaction between two species in which both derive some benefit.

**Natural disturbance:** A change caused by natural processes; e.g. in the case of the seabed, changes can be caused by the removal or deposition of sediment by currents; such natural processes can be common or rare at a particular site.

**Natural mortality:** A measurement of the rate of death from all causes other than fishing such as predation, disease, starvation, and pollution. Commonly expressed as an instantaneous rate (M). The rate of natural mortality varies from species to species, but is assumed to be  $M=0.2$  for the five critical stocks. The natural mortality rate can also be expressed as a conditional rate (termed  $n$  and not additive with competing sources of mortality such as fishing) or as annual expectation of natural death (termed  $v$  and additive with other annual expectations of death).

**Nearshore area:** The area extending outward an indefinite but usually short distance from shore; an area commonly affected by tides and tidal and storm currents, and shoreline processes.

**Nematodes:** a group of elongated, cylindrical worms belonging to the phylum Nematodea, also called thread-worms or eel-worms. Some non-marine species attack roots or leaves of plants, others are parasites on animals or insects.

**Nemertean:** Proboscis worms belonging to the phylum Nemertea, and are soft unsegmented marine worms that have a threadlike proboscis and the ability to stretch and contract.

**Nemipterids:** Fishes of the Family Nemipteridae, the threadfin breams or whiptail breams. Distribution: Tropical and sub-tropical Indo-West Pacific.

**Northeast Shelf Ecosystem:** The Northeast U.S. Shelf Ecosystem has been described as including the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream.

**Northwest Atlantic Analysis Area (NAAA):** A spatial area developed for analysis purposes only. The boundaries of this the area are within the 500 fathom line to the east, the coastline to the west, the Hague line to the north, and the North Carolina/ South Carolina border to the south. The area is approximately 83,550 square nautical miles, and is used as the denominator in the EFH analysis to determine the percent of sediment, EFH, and biomass contained in an area, as compared to the total NAAA.

**Nutrient budgets:** An accounting of nutrient inputs to and production by a defined ecosystem (e.g., salt marsh, estuary) versus utilization within and export from the ecosystem.

**Observer:** any person required or authorized to be carried on a vessel for conservation and management purposes by regulations or permits under this Act

**Oligochaetes:** See *Polychaetes*. Oligochaetes are worms in the phylum Annelida having bristles borne singly along the length of the body.

**Open access:** describes a fishery or permit for which there is no qualification criteria to participate. Open-access permits may be issued with restrictions on fishing (for example, the type of gear that may be used or the amount of fish that may be caught).

**Opportunistic species:** Species that colonize disturbed or polluted sediments. These species are often small, grow rapidly, have short life spans, and produce many offspring.

**Optimum Yield (OY):** the amount of fish which A) will provide the greatest overall benefit to the nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; B) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor; and C) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery

**Organic matter:** Material of, relating to, or derived from living organisms.

**Overfished:** A condition defined when stock biomass is below minimum biomass threshold and the probability of successful spawning production is low.

**Overfishing:** A level or rate of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis.

**Peat bank:** A bank feature composed of partially carbonized, decomposed vegetable tissue formed by partial decomposition of various plants in water; may occur along shorelines.

**Pelagic gear:** Mobile or static fishing gear that is not fixed, and is used within the water column, not on the ocean bottom. Some examples are mid-water trawls and pelagic longlines.

**Phytoplankton:** Microscopic marine plants (mostly algae and diatoms) which are responsible for most of the photosynthetic activity in the oceans.

**Piscivore:** A species feeding preferably on fish.

**Planktivore:** An animal that feeds on plankton.

**Polychaetes:** Polychaetes are segmented worms in the phylum Annelida. Polychaetes (poly-chaetae = many-setae) differ from other annelids in having many setae (small bristles held in tight bundles) on each segment.

**Porosity:** The amount of free space in a volume of a material; e.g. the space that is filled by water between sediment particles in a cubic centimeter of seabed sediment.

**Possession-limit-only permit:** an open-access permit (see above) that restricts the amount of multispecies a vessel may retain (currently 500 pounds of "regulated species").

**Pre-recruits:** Fish in size or age groups that are not vulnerable to the fishery (including discards).

**Prey availability:** The availability or accessibility of prey (food) to a predator. Important for growth and survival.

**Primary production:** The synthesis of organic materials from inorganic substances by photosynthesis.

**Recovery time:** The period of time required for something (e.g. a habitat) to achieve its former state after being disturbed.

**Recruitment:** the amount of fish added to the fishery each year due to growth and/or migration into the fishing area. For example, the number of fish that grow to become vulnerable to fishing gear in one year would be the recruitment to the fishery. "Recruitment" also refers to new year classes entering the population (prior to recruiting to the fishery).

**Recruitment overfishing:** fishing at an exploitation rate that reduces the population biomass to a point where recruitment is substantially reduced.

**Regulated groundfish species:** cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish. These species are usually targeted with large-mesh net gear.

**Relative exploitation:** an index of exploitation derived by dividing landings by trawl survey biomass. This measure does not provide an absolute magnitude of exploitation but allows for general statements about trends in exploitation.

**Retrospective pattern:** A pattern of systematic over-estimation or underestimation of terminal year estimates of stock size, biomass or fishing mortality compared to that estimate for that same year when it occurs in pre-terminal years.

**Riverine area:** The area of a river and its banks.

**Saurids:** Fish of the family Scomberesocidae, the sauries or needlefishes. Distribution: tropical and temperate waters.

**Scavenging species:** An animal that consumes dead organic material.

**Sea whips:** A coral that forms long flexible structures with few or no branches and is common on Atlantic reefs.

**Sea pens:** An animal related to corals and sea anemones with a featherlike form.

**Sediment:** Material deposited by water, wind, or glaciers.

**Sediment suspension:** The process by which sediments are suspended in water as a result of disturbance.

**Sedentary:** See *Motile* and *Mobile organisms*. Not moving. Organisms that spend the majority of their lives in one place.

**Sedimentary bedforms:** Wave-like structures of sediment characterized by crests and troughs that are formed on the seabed or land surface by the erosion, transport, and deposition of particles by water and wind currents; e.g. ripples, dunes.

**Sedimentary structures:** Structures of sediment formed on the seabed or land surface by the erosion, transport, and deposition of particles by water and wind currents; e.g. ripples, dunes, buildups around boulders, among others.

**Sediment types:** Major combinations of sediment grain sizes that form a sediment deposit, e.g. mud, sand, gravel, sandy gravel, muddy sand, among others.

**Spawning adult stage:** See *adult stage*. Adults that are currently producing or depositing eggs.

**Spawning stock biomass (SSB):** the total weight of fish in a stock that sexually mature, i.e., are old enough to reproduce.

**Species assemblage:** Several species occurring together in a particular location or region

**Species composition:** A term relating the relative abundance of one species to another using a common measurement; the proportion (percentage) of various species in relation to the total on a given area.

**Species diversity:** The number of different species in an area and their relative abundance

**Species richness:** See *Species diversity*. A measurement or expression of the number of species present in an area; the more species present, the higher the degree of species richness.

**Species with vulnerable EFH:** If a species was determined to be “highly” or “moderately” vulnerable to bottom tending gears (otter trawls, scallop dredges, or clam dredges) then it was included in the list of species with vulnerable EFH. Currently there are 23 species and life stages that are considered to have vulnerable EFH for this analysis.

**Status Determination:** A determination of stock status relative to  $B_{\text{threshold}}$  (defines overfished) and  $F_{\text{threshold}}$  (defines overfishing). A determination of either overfished or overfishing triggers a SFA requirement for rebuilding plan (overfished), ending overfishing (overfishing) or both.

**Stock:** A grouping of fish usually based on genetic relationship, geographic distribution and movement patterns. A region may have more than one stock of a species (for example, Gulf of Maine cod and Georges Bank cod). A species, subspecies, geographical grouping, or other category of fish capable of management as a unit.

**Stock assessment:** determining the number (abundance/biomass) and status (life-history characteristics, including age distribution, natural mortality rate, age at maturity, fecundity as a function of age) of individuals in a stock

**Stock of concern:** a regulated groundfish stock that is overfished, or subject to overfishing.

**Structure-forming organisms:** Organisms, such as corals, colonial bryozoans, hydroids, sponges, mussel beds, oyster beds, and seagrass that by their presence create a three-dimensional physical structure on the bottom. See *biogenic habitats*.

**Submerged aquatic vegetation:** Rooted aquatic vegetation, such as seagrasses, that cannot withstand excessive drying and therefore live with their leaves at or below the water surface in shallow areas of estuaries where light can penetrate to the bottom sediments. SAV provides an important habitat for young fish and other aquatic organisms.

**Surficial sediment:** Sediment forming the sea floor or land surface; thickness of the surficial layer may vary.

**Surplus production:** Production of new stock biomass defined by recruitment plus somatic growth minus biomass loss due to natural deaths. The rate of surplus production is directly proportional to stock biomass and its relative distance from the maximum stock size at carrying capacity ( $K$ ).  $B_{MSY}$  is often defined as the biomass that maximizes surplus production rate.

**Surplus production models:** A family of analytical models used to describe stock dynamics based on catch in weight and CPUE time series (fishery dependent or survey) to construct stock biomass history. These models do not require catch at age information. Model outputs may include stock biomass history, biomass weighted fishing mortality rates,  $MSY$ ,  $F_{MSY}$ ,  $B_{MSY}$ ,  $K$ , (maximum population biomass where stock growth and natural deaths are balanced) and  $r$  (intrinsic rate of increase).

**Survival rate (S):** Rate of survival expressed as the fraction of a cohort surviving the a period compared to number alive at the beginning of the period ( $\#$  survivors at the end of the year / numbers alive at the beginning of the year). Pessimists convert survival rates into annual total mortality rate using the relationship  $A=1-S$ .

**Survival ratio (R/SSB):** an index of the survivability from egg to age-of-recruitment. Declining ratios suggest that the survival rate from egg to age-of-recruitment is declining.

**TAC:** Total allowable catch. This value is calculated by applying a target fishing mortality rate to exploitable biomass.

**Taxa:** The plural of taxon. Taxon is a named group or organisms of any rank, such as a particular species, family, or class.

**Ten-minute- “squares” of latitude and longitude (TMS):** Are a measure of geographic space. The actual size of a ten-minute-square varies depending on where it is on the surface of the earth, but in general each square is approximately 70-80 square nautical miles in this region. This is the spatial area that EFH designations, biomass data, and some of the effort data have been binned into for analysis purposes in various sections of this document.

**Topography:** The depiction of the shape and elevation of land and sea floor surfaces.

**Total Allowable Catch (TAC):** The amount (in metric tons) of a stock that is permitted to be caught during a fishing year. In the Multispecies FMP, TACs can either be “hard” (fishing ceases when the TAC is caught) or a “target” (the TAC is merely used as an indicator to monitor effectiveness of management measures, but does not trigger a closure of the fishery).

**Total mortality:** The rate of mortality from all sources (fishing, natural, pollution) Total mortality can be expressed as an instantaneous rate (called  $Z$  and equal to  $F + M$ ) or Annual rate (called  $A$  and calculated as the ratio of total deaths in a year divided by number alive at the beginning of the year)

**Trophic guild:** Trophic is defined as the feeding level within a system that an organism occupies; e.g., predator, herbivore. A guild is defined as a group of species that exploit the same class of environmental resources in a similar way. The trophic guild is a utilitarian concept covering both structure and organization that exists between the structural categories of trophic groups and species.

**Turbidity:** Relative water clarity; a measurement of the extent to which light passing through water is reduced due to suspended materials.

**Two-bin (displacement) model:** a model used to estimate the effects of area closures. This model assumes that effort from the closed areas (first bin) is displaced to the open areas (second bin). The total effort in the system is then applied to the landings-per-unit-effort (LPUE) in open areas to obtain a projected catch. The percent reduction in catch is calculated as a net result.

**Valued Ecosystem Component:** A resource or environmental feature that is important (not only economically) to a local human population, or has a national or international profile, or if altered from its existing status, will be important for the evaluation of environmental impacts of industrial developments, and the focusing of administrative efforts.

**Vulnerability:** In order to evaluate the potential adverse effects of fishing on EFH, the vulnerability of each species EFH was determined. This analysis defines vulnerability as the likelihood that the functional value of EFH would be adversely affected as a result of fishing with different gear types. A number of criteria were considered in the evaluation of the vulnerability of EFH for each life stage including factors like the function of habitat for shelter, food and/or reproduction.

**Yield-per-recruit (YPR):** the expected yield (weight) of individual fish calculated for a given fishing mortality rate and exploitation pattern and incorporating the growth characteristics and natural mortality.

**Yearclass:** also called cohort. Fish that were spawned in the same year. By convention, the “birth date” is set to January 1st and a fish must experience a summer before turning 1. For example, winter flounder that were spawned in February-April 1997 are all part of the 1997 cohort (or year-class). They would be considered age 0 in 1997, age 1 in 1998, etc. A summer flounder spawned in October 1997 would have its birth date set to the following January 1 and would be considered age 0 in 1998, age 1 in 1999, etc.

**Z:** instantaneous rate of total mortality. The components of Z are additive (i.e.,  $Z = F+M$ )

**Zooplankton:** See *Phytoplankton*. Small, often microscopic animals that drift in currents. They feed on detritus, phytoplankton, and other zooplankton. They are preyed upon by fish, shellfish, whales, and other zooplankton.

### 10.3 List of Public Meetings

Date	Meeting Type	Location
<b>2006</b>		
9/26-9/28/2006	Council Meeting	Holiday Inn, Peabody, MA
11/6/2006	Oversight Committee	Holiday Inn, Peabody, MA
11/27/2006	Groundfish A16 Scoping Hearing	Holiday Inn, Ellsworth, ME
11/28/2006	Groundfish A16 Scoping Hearing	Eastland Park Hotel, Portland, ME
11/29/2006	Groundfish A16 Scoping Hearing	Urban Forestry Ctr., Portsmouth, NH
11/30/2006	Groundfish A16 Scoping Hearing	MA DMF, Gloucester, MA
12/5/2006	Groundfish A16 Scoping Hearing	Best Western East End, Riverhead, NY
12/7/2006	Groundfish A16 Scoping Hearing	Holiday Inn Express, Fairhaven, MA
12/12/2006	Groundfish A16 Scoping Hearing	Skyline Hotel, New York, NY
<b>2007</b>		
1/18/2007	Oversight Committee	Holiday Inn, Mansfield, Mansfield, MA
1/11/2004	PDT conference call	
2/6-2/8/07	Council Meeting	Sheraton Harborside, Portsmouth, NH
3/7/2007	PDT Meeting	Falmouth Tech Park, Falmouth, MA
4/10-4/12/07	Council Meeting	Mystic Hilton, Mystic, CT
4/20/2007	Oversight Committee	Holiday Inn, Peabody, MA
5/29/2007	Advisory Panel	Holiday Inn, Mansfield, Mansfield, MA
5/31/2007	Oversight Committee (joint with Monkfish)	Providence Biltmore, Providence, RI
6/19-6/21/07	Council Meeting	Eastland Park Hotel, Portland, ME
6/26/2007	PDT conference call	
7/25/2007	PDT Meeting	Holiday Inn, Mansfield, Mansfield, MA
8/1/2007	Oversight Committee	Holiday Inn, Peabody, MA
8/21/2007	PDT conference call	
9/5/2007	Oversight Committee	Holiday Inn, Peabody, MA
9/18-9/19/07	Council	Radisson Hotel, Plymouth, MA
10/2/2007	PDT	MA Audubon, Newburyport, MA
10/16/2007	Oversight Committee	Holiday Inn, Peabody, MA
10/22/2007	PDT	Holiday Inn, Mansfield, Mansfield, MA
11/6-11/7/07	Council Meeting	Hotel Viking, Newport, MA
12/6/2007	PDT	Holiday Inn, Mansfield, Mansfield, MA

References  
List of Public Meetings

<b>Date</b>	<b>Meeting Type</b>	<b>Location</b>
12/12-12/13/07	Oversight Committee	Holiday Inn, Peabody, MA
<b>2008</b>		
1/9/2008	PDT	Starboard Galley, Newburyport, MA
1/17/07-8	Oversight Committee	Holiday Inn, Peabody, MA
1/24/2008	Council Meeting	Sheraton Ferncroft, Danvers, MA
1/22/2008	PDT conference call	
2/11/2008	Oversight Committee	Courtyard by Marriot, Portsmouth, NH
2/12/08- 2/14/08	Council Meeting	Sheraton Harborside, Portsmouth, NH
3/19/2008	PDT Meeting	Holiday Inn, Mansfield, MA
3/27/2008	Oversight Committee	Holiday Inn by the Bay, Portland, ME
4/8/2008	PDT Meeting	Holiday Inn, Mansfield, MA
4/15-4/17/08	Council Meeting	Providence Biltmore, Providence, RI
5/13/2008	Oversight Committee	Holiday Inn, Peabody, MA
5/15/2008	PDT conference call	
5/16/2008	PDT conference call	
5/20/2008	Recreational Advisory Panel	Holiday Inn, Peabody, MA
5/27/2008	Advisory Panel	Holiday Inn, Peabody, MA
6/2/2008	Oversight Committee	Holiday Inn by the Bay, Portland, ME
6/3-6/5/08	Council Meeting	Holiday Inn by the Bay, Portland, ME
7/1/2008	PDT conference call	
7/17/2008	Oversight Committee	Holiday Inn, Peabody, MA
8/13/2008	PDT Meeting	MA Audubon, Newburyport, MA
8/21/2008	PDT conference call	
8/26/2008	Oversight Committee	Holiday Inn, Peabody, MA
9/3-9/4/08	Council Meeting	Providence Biltmore, Providence, RI
9/11/2008	PDT conference call	
9/16/2008	Advisory Panel	Sheraton Ferncroft, Danvers, MA
9/17/2008	Recreational Advisory Panel	Sheraton Ferncroft, Danvers, MA
9/29/2008	Oversight Committee	Holiday Inn, Peabody, MA
10/15/2008	PDT conference call	
10/22/2008	PDT conference call	
10/30/2008	Oversight Committee	Sheraton Harborside, Portsmouth, NH
11/18-1/20/08	Council Meeting	Sheraton Ferncroft, Danvers, MA

References  
List of Public Meetings

<b>Date</b>	<b>Meeting Type</b>	<b>Location</b>
<b>2009</b>		
1/5/2009	PDT conference call	
1/29/2009	Oversight Committee	Holiday Inn, Mansfield, MA
2/9-2/11/09	Council Meeting	Sheraton Harborside, Portsmouth, NH
4/7-4/9/09	Council Meeting	Mystic Hilton, Mystic, CT
5/26/2009	Advisory Panel	Sheraton Colonial, Wakefield, MA
5/27/2009	Recreational Advisory Panel	Sheraton Colonial, Wakefield, MA
6/4/2009	PDT	Holiday Inn, Mansfield, MA
6/17/2009	Oversight Committee	Holiday Inn, Mansfield, MA
6/22-6/25/09	Council Meeting	Holiday Inn by the Bay, Portland, ME

## 10.4 Index

### A

#### Accountability Measure

AM....8, 66, 91, 93, 132, 148, 150, 154, 155, 168, 169, 217, 218, 219, 376, 378, 382, 383, 510, 534, 550, 552, 553, 554, 581, 582, 594, 683, 710, 711, 712, 713, 720, 742, 743, 744, 745, 746, 772, 790

Affected Human Environment.....307, 308, 334, 465, 748, 749

#### Annual Catch Limit

ACL.8, 56, 66, 75, 87, 88, 89, 90, 91, 92, 93, 106, 125, 126, 127, 132, 148, 149, 150, 154, 155, 156, 157, 168, 169, 194, 195, 217, 218, 219, 309, 385, 480, 500, 505, 510, 541, 543, 550, 551, 552, 553, 581, 594, 628, 632, 683, 690, 706, 708, 709, 710, 711, 720, 740, 742, 744, 745, 746, 769, 771, 773, 781, 786, 790, 791

### B

Biological Impacts.14, 362, 484, 485, 502, 503, 510, 511, 512, 517, 522, 523, 527, 528, 539, 540, 542, 543, 553, 561, 563, 566, 567, 569, 578, 579, 580, 619, 702, 710, 741, 744

Bycatch..... 54, 109, 434, 435, 437, 444, 458, 836, 873, 875, 885, 886

### C

#### Cod

GB.54, 55, 58, 69, 71, 85, 89, 103, 105, 126, 127, 128, 131, 140, 148, 150, 157, 175, 187, 195, 208, 270, 274, 311, 338, 375, 379, 384, 385, 436, 484, 489, 496, 514, 516, 525, 528, 542, 543, 551, 553, 555, 556, 572, 573, 574, 633, 692, 708, 730, 739, 836

GOM53, 55, 57, 58, 69, 79, 82, 85, 127, 128, 134, 138, 139, 168, 175, 196, 204, 208, 214, 215, 217, 218, 270, 274, 309, 310, 311, 348, 484, 489, 496, 526, 538, 539, 542, 543, 553, 555, 556, 570, 572, 575, 578, 580, 609, 610, 633, 683, 701, 706, 713, 739, 741, 751, 763, 767, 838, 8, 10, 13

Cumulative Effects ..... 11, 16, 264, 265, 308, 849

Cumulative Impacts.....264, 265

### D

Days-at-sea (DAS) ..5, 8, 9, 10, 14, 15, 18, 49, 53, 55, 56, 57, 62, 63, 64, 66, 68, 70, 71, 72, 73, 88, 99, 100, 101, 102, 103, 116, 118, 119, 126, 127, 128, 130, 131, 133, 134, 136, 149, 150, 154, 168, 185, 186, 188, 189, 195, 196, 198, 199, 204, 205, 207, 208, 221, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 331, 335, 338, 346, 347, 348, 350, 351, 352, 353, 355, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 375, 379, 470, 471, 472, 474, 475, 476, 477, 478, 479, 480, 483, 511, 512, 513, 514, 516, 520, 522, 523, 524, 527, 534, 542, 543, 545, 546, 547, 548, 549, 550, 551, 562, 566, 567, 569, 570, 571, 573, 574, 575, 591, 593, 594, 596, 597, 600, 601, 602, 603, 608, 609, 610, 611, 612, 613, 617, 618, 621, 622, 623, 624, 625, 632, 678, 681, 682, 683, 685, 686, 687, 690, 691, 692, 696, 697, 698, 699, 700, 701, 702, 710, 712, 715, 717, 718, 720, 721, 722, 723, 724, 729, 733, 734, 738, 739, 743, 744, 745, 749, 752, 753, 755, 757, 758, 759, 760, 761, 762, 763, 764, 765, 767, 768, 769, 772, 773, 774, 775, 778, 781, 782, 783, 784, 785, 786, 787, 788, 790, 791, 792, 793, 794, 795, 796, 838, 839, 840, 846, 847, 858, 859, 860, 885, 886, 6, 7, 8, 10, 12, 13, 14, 15, 16

Category A....5, 9, 18, 57, 63, 66, 70, 71, 72, 130, 133, 134, 136, 149, 188, 189, 199, 204, 205, 208, 316, 348, 358, 359, 364, 366, 368, 520, 523, 534, 573, 593, 596, 603, 611, 612, 618, 624, 696, 701, 702, 722, 738, 739, 765, 787, 792, 886

Category B 5, 9, 10, 14, 18, 55, 56, 70, 71, 72, 73, 127, 128, 130, 131, 133, 149, 196, 198, 199, 205, 208, 316, 347, 348, 350, 351, 353, 355, 366, 514, 516, 520, 524, 569, 571, 574, 593, 594, 602, 603, 610, 611, 612, 618, 622, 623, 624, 686, 702, 721, 739, 764, 765, 768, 787, 846, 859, 886

Category C ..... 5, 71, 72, 119, 134, 205, 316, 348, 365, 366, 368, 788, 790, 886

### E

Economic impacts ...6, 11, 14, 15, 70, 221, 307, 308, 481, 482, 483, 485, 520, 626, 683, 686, 690, 705, 706, 707, 708, 710, 711, 712, 713, 721, 741, 742, 744, 746, 759, 762, 764, 770, 773, 774, 19

References

Index

Essential Fish Habitat..... 11, 13, 49, 53, 61, 62, 68, 94, 95, 97, 177, 178, 184, 254, 264, 270, 298, 312, 330, 481, 509, 516, 542, 583, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 617, 618, 619, 620, 621, 622, 623, 624, 625, 628, 842, 844, 847, 858, 875, 879, 883, 887, 892, 895, 897, 9, 20

Exclusive Economic Zone..... 49, 95, 123, 258, 259, 386, 394, 401, 408, 418, 800, 888, 3

**G**

Groundfish Assessment Review Meeting

GARM.....49, 75, 77, 79, 80, 81, 82, 85, 125, 131, 173, 195, 274, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 310, 386, 394, 435, 436, 442, 443, 444, 460, 461, 488, 496, 497, 499, 524, 528, 529, 539, 541, 542, 555, 563, 564, 570, 571, 573, 582, 606, 760, 766, 858, 877, 889

**H**

Habitat impacts.....118, 263, 618, 619, 18

*Habitat Impacts* .....13, 606, 607, 608, 609, 610, 611, 612, 613, 614, 618, 619, 620, 621, 622, 623, 624, 625

Haddock

GB...10, 53, 69, 71, 73, 77, 79, 89, 103, 117, 128, 129, 130, 131, 150, 175, 187, 193, 197, 270, 274, 309, 348, 354, 436, 490, 514, 516, 521, 537, 542, 543, 555, 557, 568, 570, 593, 594, 607, 610, 611, 622, 623, 633, 634, 679, 684, 685, 702, 740, 765, 797

GOM.....69, 79, 85, 131, 138, 139, 168, 175, 214, 215, 217, 218, 270, 274, 395, 397, 399, 400, 490, 496, 521, 533, 534, 538, 539, 543, 555, 570, 579, 580, 594, 607, 609, 611, 623, 633, 683, 704, 706, 713, 739, 741, 765, 769, 776

Halibut...8, 76, 77, 80, 83, 84, 86, 93, 139, 150, 156, 172, 176, 215, 458, 459, 486, 509, 526, 539, 580, 596, 604, 613, 625, 627, 707, 741, 770, 777

**I**

Incidental Catch TACs ..... 66, 72, 73, 116, 127, 128, 196, 348, 514, 591, 601, 610, 618, 622

**M**

Magnuson-Stevens Fishery Conservation and Management Act3, 5, 8, 50, 53, 56, 60, 61, 62, 66, 67, 68, 69, 75, 80, 81, 82, 87, 89, 94, 113, 148, 149, 169, 171, 177, 218, 219, 307, 308, 434, 501, 606, 628, 704, 712, 743, 746, 747, 766, 774, 778, 835, 839, 849, 858

Marine mammals.....800, 856, 881

**O**

Ocean pout.....70, 255, 271, 291

Overfishing Level

OFL.....87, 88, 500, 628

**P**

Plaice, American8, 60, 69, 76, 77, 79, 83, 84, 86, 93, 125, 128, 150, 156, 158, 159, 172, 175, 176, 230, 232, 254, 271, 274, 284, 445, 446, 486, 492, 499, 509, 526, 559, 564, 627, 633, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 891, 894, 4

Pollock...8, 76, 77, 81, 83, 84, 86, 93, 128, 150, 156, 158, 159, 172, 176, 256, 271, 274, 289, 308, 348, 353, 357, 401, 402, 404, 406, 407, 408, 464, 486, 499, 509, 520, 526, 564, 627, 633, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672

**R**

Redfish ..8, 69, 76, 77, 83, 84, 86, 93, 150, 156, 158, 159, 172, 175, 176, 256, 271, 452, 453, 486, 495, 499, 509, 526, 560, 564, 594, 627, 633, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672

References  
Index

**S**

Social Impact Analysis.....51, 465, 748, 750, 763, 771  
*Social impacts*..... 15, 481, 746, 749, 761, 763, 765, 766, 770, 774  
Special Access Program .....5, 50, 55, 56, 70, 764  
    Closed Area I Hook Gear Haddock SAP ..... 10, 70, 73, 128, 129, 197, 312, 592, 601, 610, 702, 796, 798  
    Closed Area II Haddock SAP ..... 128  
Status Determination Criteria 6, 69, 75, 94, 171, 485, 486, 554, 582, 599, 606, 619, 626, 627, 713, 765, 774, 791

**W**

White hake.....69, 168, 256, 261, 271, 288, 564  
Windowpane flounder .....69, 167, 175, 204, 257  
Winter flounder  
    GB ....6, 81, 85, 127, 150, 196, 271, 338, 448, 493, 496, 525, 542, 553, 555, 570, 572, 574, 610, 701, 739  
    GOM ..... 57, 82, 126, 150, 195, 271, 274, 386, 389, 392, 488, 543, 555, 570, 632  
    SNE/MA .57, 69, 80, 85, 126, 127, 131, 150, 175, 195, 196, 204, 208, 271, 388, 487, 494, 496, 520, 523, 524, 528, 529, 530, 532, 542, 552, 553, 555, 560, 570, 571, 573, 574, 576, 593, 602, 604, 610, 611, 624, 625, 634, 685, 686, 701, 709, 721, 739, 763, 765, 782, 783  
Witch flounder.....81, 257, 271, 283, 447, 493, 559  
Wolffish, Atlantic ..76, 77, 81, 94, 95, 177, 216, 271, 486, 501, 539, 561, 581, 583, 596, 599, 604, 607, 613, 620, 625, 627, 628, 707, 714, 741, 766, 770, 774, 777, 781, 786, 791

**Y**

Yellowtail flounder  
    CC/GOM.....57, 69, 82, 127, 128, 150, 175, 196, 204, 208, 270, 348, 492, 525, 542, 551, 553, 555, 558, 570, 572, 574, 610, 739, 751  
    SNE/MA .57, 69, 76, 91, 127, 134, 150, 172, 175, 196, 204, 208, 270, 309, 338, 491, 500, 523, 525, 528, 529, 531, 542, 552, 553, 555, 558, 570, 572, 574, 610, 633, 634, 765, 782

References  
Index

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## **Appendix I**

### **Summary of Past, Present, or Reasonably Foreseeable Future Actions**

## **APPENDIX I**

The actions summarized in the table below are presented in chronological order, and codes indicate whether an action relates to the past (P), present (Pr), or reasonably foreseeable future (RFF). When any of these abbreviations occur together, it indicates that some past actions are still relevant to the present and/or future. A brief explanation of the rationale for concluding what effect each action has (or will have) had on each of the VECs is provided in the table and is not repeated here.

**Table I-1. Impacts of Past, Present and Reasonably Foreseeable Future Actions on the five VECs. These actions do not include those which were considered to have little impact on the fishery or actions under consideration in this Amendment.**

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
<b>MULTISPECIES FISHERY-RELATED ACTIONS</b>						
<sup>P</sup> Prosecution of the groundfish fisheries by foreign fleets in the area that would become the U.S. EEZ (prior to implementation of the MSA)	Foreign fishing pressure peaked in the 1960s and slowly declined until passage of the MSA in 1974 and implementation of the Multispecies FMP	<b>Direct High Negative</b> Foreign fishing depleted many groundfish stocks	<b>Potentially Direct High Negative</b> Limited information on discarding, but fishing effort was very high and there were no gear requirements to reduce bycatch	<b>Potentially Direct High Negative</b> Limited information on protected resources encounters, but fishing effort was very high	<b>Potentially Direct High Negative</b> Limited information on habitat, but fishing effort was very high	<b>Potentially Indirect Negative</b> Revenue from fishing was split between foreign and domestic communities, rather than just domestic communities
<sup>P</sup> Original FMP implemented in 1977	Established management of cod, haddock and yellowtail via catch quotas, quota allocations by vessel class and catch limits	<b>Direct Positive</b> Provided slight effort reductions and regulatory tools available to rebuild and manage stocks	<b>Indirect Positive</b> Reduced directed fishing effort on cod, haddock and yellowtail which resulted in discard/bycatch reductions	<b>Indirect Positive</b> Reduced fishing effort, thus reduced interactions with protected species	<b>Indirect Positive</b> Reduced fishing effort, thus reduced gear interactions with habitat	<b>Indirect Positive</b> Increased probability of long term sustainability

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
<b>MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED</b>						
<sup>P</sup> Interim Plan (1982)	Implemented GB seasonal closed areas, minimum fish size requirements in GB and GOM and permit requirements	<b>Direct Positive</b> Reduced directed fishing effort	<b>Indirect Positive</b> Reduced directed fishing effort which resulted in discard/bycatch reductions	<b>Indirect Positive</b> Reduced fishing effort, thus reduced interactions with protected species	<b>Indirect Positive</b> Reduced fishing effort, thus reduced gear interactions with habitat	<b>Indirect Positive</b> Increased probability of long term sustainability
<sup>P</sup> Multispecies Plan (1986)	Revised FMP to include pollock, redfish, winter flounder, American plaice, witch flounder, windowpane flounder and white hake. Allowed additional minimum fish size restrictions, extended GB spawning area closures and a SNE closure to protect yellowtail flounder	<b>Direct Positive</b> Reduced directed fishing effort and provided the opportunity to manage additional groundfish species	<b>Indirect Positive</b> Reduced directed fishing effort which resulted in discard/bycatch reductions	<b>Indirect Positive</b> Reduced fishing effort, thus reduced interactions with protected species	<b>Indirect Positive</b> Reduced fishing effort, thus reduced gear interactions with habitat	<b>Indirect Positive</b> Increased probability of long term sustainability

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
<b>MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED</b>						
<p><sup>P</sup> Amendments 1-4 to the Multispecies FMP (1987-1991)</p>	<p>Implemented closure in SNE/MA to protect yellowtail, extended GB RMA, added minimum mesh size requirements to SNE, excluded scallop dredge vessels from SNE closure, incorporated silver hake, red hake and ocean pout into the FMP</p>	<p><b>Direct Positive</b> Reduced directed fishing effort and provided the opportunity to manage additional groundfish species</p>	<p><b>Indirect Positive</b> Reduced directed fishing effort which resulted in discard/bycatch reductions</p>	<p><b>Indirect Positive</b> Reduced fishing effort, thus reduced interactions with protected species</p>	<p><b>Indirect Positive</b> Reduced fishing effort, thus reduced gear interactions with habitat</p>	<p><b>Indirect Positive</b> Increased probability of long term sustainability</p>
<p><sup>P</sup> Multispecies Emergency Action (1994)</p>	<p>Implemented 500-lb haddock trip limit, expanded CA II closure time and area, prohibited scallop dredge vessels from possessing haddock from Jan-Jun and prohibited pair-trawling for multispecies</p>	<p><b>Direct Positive</b> Reduced directed fishing effort</p>	<p><b>Indirect Positive</b> Reduced directed fishing effort which resulted in discard/bycatch reductions</p>	<p><b>Indirect Positive</b> Reduced fishing effort, thus reduced interactions with protected species</p>	<p><b>Indirect Positive</b> Reduced fishing effort, thus reduced gear interactions with habitat</p>	<p><b>Indirect Positive</b> Increased probability of long term sustainability</p>

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
<b>MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED</b>						
P, Pr Amendment 5 to the FMP (1994)	Made the above Emergency Action measures permanent, enacted a moratorium on new participants in the fishery, reduced DAS for most vessels by 50% over a 5-7 year period, implemented mandatory reporting and observer requirements, etc.	<b>Direct High Positive</b> Reduced directed fishing effort and capped the number of participants allowed to direct on the fishery	<b>Indirect Positive</b> Reduced directed fishing effort which resulted in discard/bycatch reductions	<b>Indirect Positive</b> Reduced fishing effort, thus reduced interactions with protected species	<b>Indirect Positive</b> Reduced fishing effort, thus reduced gear interactions with habitat	<b>Mixed</b> Increased probability of long term sustainability by limiting the number of participants in the directed fishery. However, there was a negative impact for fishermen and communities where participation was reduced
,Pr Emergency Action (1994)	Implemented additional closed areas, prohibited scallop vessels from fishing in the closed areas, disallowed any fishery using mesh smaller than minimum mesh requirements, prohibited retaining regulated species with small mesh, etc.	<b>Direct High Positive</b> Reduced directed fishing effort	<b>Indirect Positive</b> Reduced directed fishing effort which resulted in discard/bycatch reductions	<b>Indirect Positive</b> Reduced fishing effort, thus reduced interactions with protected species	<b>Indirect Positive</b> Reduced fishing effort, thus reduced gear interactions with habitat	<b>Mixed</b> Increased probability of long term sustainability but effort reductions result in short term lost revenues for fishermen and communities

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
<b>MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED</b>						
P, Pr Framework 9 (1985)	Made the above Emergency Action measures permanent	<b>Direct High Positive</b> Reduced directed fishing effort	<b>Indirect Positive</b> Reduced directed fishing effort which resulted in discard/bycatch reductions	<b>Indirect Positive</b> Reduced fishing effort, thus reduced interactions with protected species	<b>Indirect Positive</b> Reduced fishing effort, thus reduced gear interactions with habitat	<b>Mixed</b> Increased probability of long term sustainability but effort reductions result in short term lost revenues for fishermen and communities
P, Pr Amendment 7 to the Multispecies FMP (1996)	Accelerated Amendment 5 DAS reduction schedule, implemented seasonal GOM closures, implemented 1,000 lb haddock trip limit, expanded the 5% bycatch rule, etc.	<b>Direct High Positive</b> Reduced directed fishing effort	<b>Indirect Positive</b> Reduced directed fishing effort which resulted in discard/bycatch reductions	<b>Indirect Positive</b> Reduced fishing effort, thus reduced interactions with protected species	<b>Indirect Positive</b> Reduced fishing effort, thus reduced gear interactions with habitat	<b>Mixed</b> Increased probability of long term sustainability but effort reductions result in short term lost revenues for fishermen and communities

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
<b>MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED</b>						
P, Pr Framework 20 (1997)	Implemented GOM cod daily trip limit of 1,000 lb, increased the haddock daily trip limit to 1,000 lb and added gillnet effort-reduction measures such as net limits	<b>Mixed</b> Reduced directed fishing effort but allowed for an increase in haddock landings	<b>Mixed</b> Gillnet restrictions and reduced effort on cod helped reduce discards/bycatch but this may have been offset by increased effort on haddock	<b>Indirect Positive</b> Although the haddock daily trip limit increased, gillnet restrictions provide an overall positive impact	<b>Mixed</b> Reduced cod daily trip limit would be offset by increase haddock daily landing limit	<b>Mixed</b> Reduced revenues from a smaller cod daily trip limit could be offset by the increased haddock daily landing limit but gillnet effort reductions also have negative eco/soc impacts
P, Pr Framework 24 (1998)	Implemented an adjustment to GOM cod daily trip limit by requiring vessels to remain in port and run their DAS clock for a cod overage and implemented the DAS carryover provisions	<b>Direct Low Positive</b> Implemented minor effort reductions	<b>Indirect Low Positive</b> Implemented minor effort reductions which resulted in minor discard/bycatch reductions	<b>Indirect Low Positive</b> Slightly reduced fishing effort, thus reduced interactions with protected species	<b>Indirect Low Positive</b> Reduced fishing effort, thus reduced gear interactions with habitat	<b>Mixed</b> Vessels must remain in port with their clock running for a cod overage which has a negative impact but vessels may carryover DAS from one fishing year into the next.
P, Pr Framework 25 (1998)	Implemented GOM inshore closure areas, the year-round WGOM closure, the CLCA and reduced the GOM cod daily trip limit to 700 lb	<b>Direct Low Positive</b> Implemented effort reductions via reduced cod trip limit and closure areas	<b>Indirect Low Positive</b> Reduced directed fishing effort which resulted in discard/bycatch reductions	<b>Indirect Positive</b> Effort controls result in reduced interactions with protected species	<b>Indirect High Positive</b> Closure areas and effort controls reduce gear interactions with habitat	<b>Mixed</b> Increased probability of long term sustainability but short term negative eco/soc impacts

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
<b>MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED</b>						
P, Pr Framework 26 (1999)	Expansion of April GOM inshore closure area and, additional seasonal inshore GOM and GB area closures	<b>Direct Low Positive</b> Implemented effort reductions via closure areas	<b>Indirect Low Positive</b> Reduced directed fishing effort which resulted in discard bycatch reductions	<b>Indirect Positive</b> Effort controls result in reduced interactions with protected species	<b>Indirect High Positive</b> Closure areas and effort controls reduce gear interactions with habitat	<b>Mixed</b> Increased probability of long term sustainability but short term negative eco/soc impacts
P, Pr, RFF Amendment 11 (1998)	Designated EFH for all species in the multispecies FMP and required Federal agencies to consult with NMFS on actions that may adversely effect EFH	<b>Indirect Low Positive</b> A consultation with NFMS that leads to the protection of multispecies EFH is beneficial to multispecies stocks	<b>Indirect Low Positive</b> A consultation with NFMS that leads to the protection of multispecies EFH is beneficial to other stocks that share the same EFH as multispecies stocks	<b>Indirect Low Positive</b> Consultation with NFMS that leads to the protection of multispecies EFH is beneficial to protected resources that share a need for the same habitat that multispecies stocks require	<b>Direct High Positive</b> Consultation with NMFS on activities that may adversely effect habitat provides NMFS the opportunity to mitigate or even prevent EFH impacts	<b>Indirect Low Positive</b> For instances where NMFS consults on projects impacting multispecies EFH, the overall health of the stocks should improve which would lead to long term sustainability

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
<b>MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED</b>						
P, Pr Framework 27 (1999)	Established large GOM rolling closures, modified CLCA, decreased GOM daily trip limit to 200 lb with subsequent reduction to 30 lb, increased haddock trip limit to 2,000 lb and increased minimum mesh size	<b>Mixed</b> Reduced directed fishing effort while also allowing the haddock trip limit to increase	<b>Mixed</b> A reduction in directed effort helped minimize bycatch and discards but increased haddock trip limit was somewhat offsetting	<b>Mixed</b> Reduced directed effort helps minimize protected species encounters but this was somewhat offset by the increased haddock trip limit	<b>Indirect Positive</b> Reduced directed effort and closed areas help improve habitat, this may be slightly offset by the increased haddock trip limit	<b>Mixed</b> Short term negative from closed areas and the reduced cod trip limit which were not offset by the increased haddock trip limit. Long term positive because of increased probability of sustainable stocks
P Interim Rule (1999)	Revised GOM cod trip limit to 100 lb/day up to 500 lb max and revised the DAS running clock to allow a 1-day overage only	<b>Direct Positive</b> Reduced directed fishing effort	<b>Indirect Positive</b> Reduced directed fishing effort which resulted in discard/bycatch reductions	<b>Indirect Low Positive</b> Effort controls result in reduced interactions with protected species	<b>Indirect Low Positive</b> Effort controls result in reduced habitat interactions	<b>Mixed</b> Increased probability of long term sustainability but short term negative eco/soc impacts
P, Pr, RFF Amendment 9 (1999)	Prohibited used of brush sweep trawl gear, added halibut to the FMP with a 1-fish per trip possession limit	<b>Direct Positive</b> Reduced directed fishing effort	<b>Indirect Positive</b> Reduced directed fishing effort which resulted in discard/bycatch reductions	<b>Indirect Low Positive</b> Effort controls result in reduced interactions with protected species	<b>Indirect High Positive</b> Effort controls result in reduced habitat interactions	<b>Mixed</b> Increased probability of long term sustainability but short term negative eco/soc impacts

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
<b>MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED</b>						
P, Pr Framework 31 (2000)	Increased GOM Daily limit to 400 lb/day up to 4,000/lb per trip, added Feb GOM inshore closure and extended 1999 Interim Rule running clock measure	<b>Mixed</b> Increased cod directed fishing effort while also reducing effort via closure area and cod running clock measure	<b>Mixed</b> Increased effort on cod could lead to greater discards/bycatch which would be somewhat offset by effort reductions via closure area and cod running clock measure	<b>Mixed</b> Increased cod effort could increase interactions but somewhat offset by effort reductions via closure area and cod running clock measure	<b>Indirect Low Positive</b> Minor positive impacts from inshore closure area	<b>Mixed</b> Short term positive from increased cod trip limit but long-term sustainability of the cod resource was effected
P, Pr Framework 33 (2000)	Added GB seasonal closure area, added conditional GOM closure areas and increase haddock trip limit to 3,000 lb	<b>Mixed</b> Increased haddock directed fishing effort while also reducing effort via closure areas	<b>Mixed</b> Increased effort on haddock could lead to greater discards/bycatch which would be somewhat offset by effort reductions via closure areas	<b>Mixed</b> Increased haddock effort could increase interactions but somewhat offset by effort reductions via closure areas	<b>Indirect Low Positive</b> Minor positive impacts from closure areas	<b>Mixed</b> Short term positive from increased haddock trip limit but negative impacts resulting from closure areas

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
<b>MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED</b>						
P, Pr, RFF Interim Action (Settlement Agreement; 2002)	Restricted DAS use, modified DAS clock for trip vessels, added year-round closure of CLCA, expanded rolling closures, prohibited front-loading DAS clock, increased GOM trawl and gillnet mesh size, added new limitations on Day gillnets and further restricted charter/party vessels	<b>Direct High Positive</b> Implemented substantial directed fishing reductions	<b>Indirect High Positive</b> Implemented substantial directed fishing reductions which also reduced discards/bycatch	<b>Indirect Positive</b> Fishing reductions and expanded closure areas reduce protected species interactions	<b>Indirect High Positive</b> Fishing reductions and expanded closure areas reduce negative impacts to habitat	<b>Mixed</b> Short term impacts due to restrictions were highly negative but positive regarding the long term sustainability of the fishery

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
<b>MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED</b>						
P, Pr, RFF Interim Action (Settlement Agreement Continued; 2002)	Continued above interim measures, further reduced DAS allocations, prohibited issuance of additional handgear permits, eliminated GOM Jan and Feb closures, increased SNE trawl and GB/SNE gillnet mesh sizes, further limited day and trip gillnets, added longline gear restrictions, added possession limit and restrictions on yellowtail catch and increased GOM cod daily trip limit to 500/4,000 lb max	<b>Direct High Positive</b> Implemented substantial directed fishing reductions	<b>Indirect High Positive</b> Implemented substantial directed fishing reductions which also reduced discards/bycatch	<b>Indirect Positive</b> Fishing reductions reduce protected species interactions	<b>Indirect Positive</b> Fishing reductions reduce negative impacts to habitat	<b>Mixed</b> Short term impacts due to restrictions were highly negative but improving the long term sustainability of the fishery was positive

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
<b>MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED</b>						
P, Pr, RFF Amendment 13 (2004)	Adopted new rebuilding periods and a new rebuilding program that included periodic adjustments and default DAS reductions to reduce effort over time, allowed DAS to be leased or transferred, created sector allocation and special access programs to allow access to stocks that can support an increase in catch	<b>Direct High Positive</b> Implemented substantial directed fishing reductions	<b>Mixed</b> Implemented substantial directed fishing reductions which also reduced discards/bycatch. However, the more stringent restrictions created pressure to direct on other stocks (e.g., monkfish)	<b>Indirect Positive</b> Fishing reductions reduce protected species interactions	<b>Indirect Positive</b> Fishing reductions reduce negative impacts to habitat	<b>Mixed</b> Short term impacts due to restrictions were highly negative but improving the long term sustainability of the fishery was positive
P, Pr, RFF Framework 40A (2004)	Created additional SAPs to target healthy stocks	<b>Direct Positive</b> Directing effort toward healthy stocks relieved pressure on stocks of concern	<b>Indirect Negative</b> Increased bycatch of monkfish and skates	<b>Negligible</b> Although effort increased slightly, no effort shifts impacting protected species are known to have occurred	<b>Negligible</b> Although effort increased slightly, no effort shifts impacting habitat are known to have occurred	<b>Indirect Positive</b> Provided vessels the opportunity for greater revenue while relieving pressure on stocks of concern

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<b>MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED</b>						
P, Pr, RFF Framework 40B (2005)	Relaxed DAS leasing and transfer requirements, created new yellowtail flounder SAP, provided greater opportunity for vessels to participate in the GB Cod Hook Sector, removed the net trip limit for gillnets, etc.	<b>Negligible</b> Mix of alternatives, some of which slightly increased effort and others that slightly decreased effort. Overall, changes did not threaten rebuilding targets established by Amendment 13	<b>Indirect Low Negative</b> Mix of alternatives that primarily had little impact on discards/bycatch with the exception of removing the net trip limit for gillnets which increased monkfish effort	<b>Negligible</b> Slight effort changes did not have measurable impacts to protected species	<b>Negligible</b> Slight effort changes did not have measurable impacts to habitat	<b>Indirect Low Positive</b> Slight changes to the leasing and transfer programs along with greater opportunities to participate in SAPs provides an opportunity for greater revenue
P, Pr, RFF Framework 41 (2005)	Allowed for participation in the Hook Gear Haddock SAP by non-Sector vessels	<b>Direct Low Positive</b> Encouraged effort on haddock, a healthy stock, and thus away from other stocks of concern	<b>Indirect Low Negative</b> Although directed effort shifted to a healthier stock, there was an overall effort increase resulting in a greater opportunity for bycatch/discards	<b>Negligible</b> Slight effort changes did not have measurable impacts to protected species	<b>Negligible</b> Slight effort changes did not have measurable impacts to habitat	<b>Indirect Low Positive</b> Greater opportunity to fish for a healthy stock provides increased revenue

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P Emergency Action (2006)	Implemented differential A DAS of 1.4:1, restricted the B Regular DAS program and US/CA Haddock SAP and reduced trip limits on cod, yellowtail, etc.	<b>Direct High Positive</b> Implemented effort reductions that anticipated achieving mortality reductions needed to keep stocks on track to rebuild	<b>Mixed</b> Effort reductions lead to reduced discards/bycatch but the B Regular DAS program increased monkfish and skate bycatch	<b>Negligible</b> Effort changes did not have measurable impacts to protected species	<b>Negligible</b> Effort changes did not have more than minimal impacts to habitat	<b>Mix</b> Short term effort reductions have a negative impact on revenues but increase long term sustainability of stocks
<b>MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED</b>						
P, Pr, RFF Framework 42 (2006)	Reduced the number of A DAS available, modified differential DAS counting to 2:1 in the GOM and SNE, reduced trip limits for several stocks, increased recreations minimum fish sizes, required use of VMS by all vessels, modified the SAPs, limited the bycatch of monkfish and skates for vessels using a haddock separator trawl, etc.	<b>Direct High Positive</b> Implemented effort reductions that anticipated achieving mortality reductions needed to keep stocks on track to rebuild	<b>Indirect Positive</b> Effort reductions lead to reduced discards/bycatch and measures were implemented to control monkfish and skate bycatch	<b>Indirect Low Positive</b> Overall effort reductions have a positive impact, particularly to protected species in high use areas such as the GOM and SNE where strict differential counting rules are in effect	<b>Indirect Low Positive</b> Overall effort reductions have a positive impact	<b>Mixed</b> Effort reductions have a significant negative impact to vessel owners and communities, primarily due to loss of revenues. Over the long term however, stocks should remain sustainable

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<b>MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED</b>						
P, Pr, RFF Framework 43 (2006)	Established a haddock incidental bycatch limit in the herring fishery on GB	<b>Mixed</b> While the incidental haddock allowance allows some legal catch of haddock which has a negative impact, the area is closed after the bycatch cap is reached which prohibits further harvest (positive impact)	<b>Negligible</b> The herring fishery is fairly clean and the increased haddock bycatch problem arose from strong 2003 and 2004 year classes. Allowing legal retention of haddock bycatch should not alter fishing practices in a manner that would impact species taken as bycatch	<b>Negligible</b> Although attaining the bycatch cap could reduce effort on GB, the extent of this reduction was not expected to have an overall impact on protected species	<b>Negligible</b> Gear used to target herring have been found not to have an impact on habitat	<b>Mixed</b> Allowing herring vessels to continue fishing practices on GB has a positive impact on those vessels and communities. However, the loss of the potential haddock catch has a negative impact on fishermen targeting groundfish
RFF Framework 44 (2010)	Would set ACLs, establish TACs for transboundary U.S./CA stocks, and possibly make adjustments to trip limits/DAS measures	<b>Unknown</b> Analysis is not complete however, positive impacts are likely as effort would be further managed for sustainability	<b>Unknown</b> Analysis is not complete however, positive impacts are likely as effort would be further managed for sustainability	<b>Unknown</b> Analysis is not complete however, positive impacts are likely as effort would be further managed for sustainability thus potentially reducing opportunities for interactions with protected species	<b>Unknown</b> Analysis is not complete however, positive impacts are likely as effort would be further managed for sustainability thus potentially reducing effort and gear impacts	<b>Negative</b> Analysis is not complete however, negative short-term impacts are likely as any further effort reductions would further reduce revenues

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<b>MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED</b>						
<sup>RF</sup> Sector EAs (2010)	Sector EAs would be prepared for each sector approved under this Amendment. These documents would assess impacts from exemptions granted to individual sectors that go beyond the universal exemptions	<b>Negligible</b> Because exemptions granted to sectors must strive to have neutral impacts compared to common pool vessels, impacts would be negligible	<b>Negligible</b> Because exemptions granted to sectors must strive to have neutral impacts compared to common pool vessels, impacts would be negligible	<b>Negligible</b> Because exemptions granted to sectors must strive to have neutral impacts compared to common pool vessels, impacts would be negligible	<b>Negligible</b> Because exemptions granted to sectors must strive to have neutral impacts compared to common pool vessels, impacts would be negligible	<b>Low Positive</b> Because one of the intents of sectors is to provide participants greater freedom to maximize their operations, revenues would be expected to be slightly higher
<b>OTHER FISHERY-RELATED ACTIONS</b>						
<sup>P, Pr, RF</sup> Atlantic Sea Scallop FMP – a series of amendment and framework actions from the mid-1990s through the present	Implementation of the Atlantic Sea Scallop FMP and continued management of the fishery, primarily through effort controls	<b>Direct Positive</b> Effort reductions taken over time have resulted in a sustainable scallop fishery	<b>Indirect Positive</b> Effort reductions taken over time also reduced bycatch, including gear modifications that improved bycatch escapement	<b>Mixed</b> Effort reductions taken over time reduced interactions with protected species however, turtle interactions remain problematic	<b>Indirect Positive</b> Effort reductions reduced gear contact with habitat and the current rotational access program focuses fishing effort on sandy substrates which are less susceptible to habitat impacts	<b>Indirect Positive</b> Initial negative impacts due to effort reductions have been supplanted by a sustainable, profitable fishery

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<b>OTHER FISHERY-RELATED ACTIONS CONTINUED</b>						
<sup>P, Pr, RFF</sup> Monkfish FMP – a series of amendment and framework actions from implementation of the FMP in 1999 through the present	Implementation of the monkfish FMP and continued management of the fishery, primarily through effort controls	<b>Direct Positive</b> Effort reductions have resulted in a fishery that is no longer overfished, nor is overfishing occurring	<b>Indirect Positive</b> Effort reductions taken over time also reduced bycatch	<b>Indirect Positive</b> Reducing effort reduced opportunities for interactions with protected species	<b>Indirect Positive</b> Reducing effort reduced opportunities for habitat interactions	<b>Indirect Positive</b> Reducing effort has created a sustainable fishery
<sup>Pr, RFF</sup> Large Whale Take Reduction Plan Amendment (2008)	Removed the DAM program, will implement sinking ground lines for lobster gear, includes more trap/pot and gillnet fisheries under the protection plan and requires additional markings on gear to improve information regarding where and how entanglements occur	<b>Negligible</b> Changes implemented through the amendment are not expected to have substantial changes on groundfish	<b>Negligible</b> Changes implemented through the amendment are not expected to have substantial changes on non-groundfish species	<b>Direct Positive</b> New regulations implemented to protect large whales are expected to have a positive impact on large whales by reducing incidental takes	<b>Negligible</b> Changes implemented through the amendment are not expected to have substantial changes to habitat	<b>Indirect Negative</b> Changes implemented through the amendment require some gear changes for gillnet fisheries which have minor negative economic impacts

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<b>OTHER FISHERY-RELATED ACTIONS CONTINUED</b>						
<sup>RF</sup> Harbor Porpoise Take Reduction Plan Amendment (~2010)	Options are currently under development to reduce takes of harbor porpoise toward the long-term zero mortality rate goal	<b>Unknown</b> If current measures such as closure areas and the use of pingers are expanded upon or modified, it could impact groundfish	<b>Unknown</b> If current measures such as closure areas and the use of pingers are expanded upon or modified, it could impact non-groundfish species	<b>Direct Positive</b> Changes to protect harbor porpoise have a positive impact on protected species	<b>Unknown</b> If current measures such as closure areas and the use of pingers are expanded upon or modified, it could impact habitat	<b>Unknown</b> If current measures such as closure areas and the use of pingers are expanded upon or modified, it could impact human communities
<sup>RF</sup> Essential Fish Habitat Omnibus Amendment (~2010/2011)	This amendment would revised EFH designations for all New England fisheries, possibly establish new HAPCs and consider measures to further protect critical habitat	<b>Unknown</b> If new measures are implemented to protect habitat, they would likely have a positive impact on groundfish	<b>Unknown</b> If new measures are implemented to protect habitat, they could have a positive impact non-groundfish species	<b>Unknown</b> If new measures are implemented to protect habitat, they could potentially impact protected species	<b>Direct Positive</b> New measures implemented to protect habitat would have a positive impact on habitat	<b>Unknown</b> If new measures are implemented to protect habitat, they would likely impact human communities
<sup>RF</sup> Amendment 3 to the Skate FMP (2010)	This amendment would address rebuilding of winter and thorny skates and reduce mortality on little and smooth skates	<b>Unknown</b> If actions are taken to reduce skate mortality, they could impact groundfish	<b>Unknown</b> If actions are taken to reduce skate mortality, they could impact non-groundfish species	<b>Unknown</b> If actions are taken to reduce skate mortality, they could impact protected species	<b>Unknown</b> If actions are taken to reduce skate mortality, they could impact habitat	<b>Unknown</b> If actions are taken to reduce skate mortality, they could impact human communities

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<b>NON FISHERY-RELATED ACTIONS</b>						
P, Pr, RFFA Agriculture runoff	Nutrients applied to agriculture land are introduced into aquatic systems	<b>Indirect Negative</b> Reduced habitat quality in the immediate project area	<b>Indirect Negative</b> Reduced habitat quality in the immediate project area	<b>Direct Negative</b> Reduced habitat quality in the immediate project area	<b>Indirect Negative</b> Reduced habitat quality in the immediate project area	<b>Indirect Negative</b> Reduced habitat quality negatively affects resource viability and can lead to reduced income from fishery resources
P, Pr, RFFA Port maintenance	Dredging of wetlands, coastal, port and harbor areas for port maintenance	<b>Indirect Negative</b> Localized decreases in habitat quality	<b>Indirect Negative</b> Localized decreases in habitat quality	<b>Direct Negative</b> Reduced habitat quality in the immediate project area	<b>Indirect Negative</b> Localized decreases in habitat quality in the immediate project area	<b>Indirect Negative</b> Reduced habitat quality negatively affects resource viability in the immediate project area
P, Pr, RFFA Offshore disposal of dredged materials	Disposal of dredged materials	<b>Indirect Negative</b> Localized decreases in habitat quality in the immediate project area	<b>Indirect Negative</b> Localized decreases in habitat quality in the immediate project area	<b>Direct Negative</b> Reduced habitat quality in the immediate project area	<b>Indirect Negative</b> Localized decreases in habitat quality in the immediate project area	<b>Indirect Negative</b> Reduced habitat quality negatively affects resource viability in the immediate project area

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<b>NON FISHERY-RELATED ACTIONS CONTINUED</b>						
P, Pr, RFFA Beach nourishment	Offshore mining of sand for beaches	<b>Indirect Negative</b> Localized decreases in habitat quality in the immediate project area	<b>Indirect Negative</b> Localized decreases in habitat quality in the immediate project area	<b>Direct Negative</b> Reduced habitat quality in the immediate project area	<b>Indirect Negative</b> Localized decreases in habitat quality in the immediate project area	<b>Mixed</b> Positive for mining companies, possibly negative for fisheries
	Placement of sand to nourish beach shorelines	<b>Indirect Negative</b> Localized decreases in habitat quality in the immediate project area	<b>Indirect Negative</b> Localized decreases in habitat quality in the immediate project area	<b>Direct Negative</b> Reduced habitat quality in the immediate project area	<b>Indirect Negative</b> Localized decreases in habitat quality in the immediate project area	<b>Positive</b> Improves beaches and can help protect homes along the shore line
P, Pr, RFFA Marine transportation	Expansion of port facilities, vessel operations and recreational marinas	<b>Indirect Negative</b> Localized decreases in habitat quality in the immediate project area	<b>Indirect Negative</b> Localized decreases in habitat quality in the immediate project area	<b>Direct Negative</b> Reduced habitat quality in the immediate project area	<b>Indirect Negative</b> Localized decreases in habitat quality in the immediate project area	<b>Mixed</b> Positive for some interests, potential displacement for others
P, Pr, RFFA Installation of pipelines, utility lines and cables	Transportation of oil, gas and energy through pipelines, utility lines and cables	<b>Indirect Negative</b> Initially localized decreases in habitat quality in the immediate project area	<b>Indirect Negative</b> Initially localized decreases in habitat quality in the immediate project area	<b>Indirect Negative</b> Initially localized decreases in habitat quality in the immediate project area	<b>Potentially Direct Negative</b> Initially reduced habitat quality in the immediate project area	<b>Mixed</b> End users benefit from improved pipelines, cables, etc., but reduced habitat quality may impact fisheries and revenues

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<b>NON FISHERY-RELATED ACTIONS CONTINUED</b>						
Pr. RFFA Liquefied Natural Gas (LNG) terminals (w/in 5 years)	Transportation of natural gas via tanker to terminals located offshore and onshore (Several LNG terminals are proposed, including ME, MA, NY, NJ and MD)	<b>Indirect Negative</b> Initially localized decreases in habitat quality in the immediate project area	<b>Indirect Negative</b> Initially localized decreases in habitat quality in the immediate project area	<b>Indirect Negative</b> Initially localized decreases in habitat quality in the immediate project area	<b>Potentially Direct Negative</b> Localized decreases in habitat quality possible in the immediate project area	<b>Mixed</b> End users benefit from a steady supply of natural gas but reduced habitat quality may impact fisheries and revenues
RFFA Offshore Wind Energy Facilities (w/in 5 years)	Construction of wind turbines to harness electrical power (Several facilities proposed from ME through NC, including off the coast of MA)	<b>Indirect Negative</b> Initially localized decreases in habitat quality in the immediate project area	<b>Indirect Negative</b> Initially localized decreases in habitat quality in the immediate project area	<b>Potentially Direct Negative</b> Localized decreases in habitat quality possible in the immediate project area	<b>Potentially Direct Negative</b> Localized decreases in habitat quality possible in the immediate project area	<b>Mixed</b> End users benefit from a clean energy production but reduced habitat quality may impact fisheries and revenues