Framework Adjustment 1
to the

Atlantic Mackerel, Squid, and Butterfish FMP

Summer Flounder, Scup, and Black Sea Bass FMP

Bluefish FMP

Tilefish FMP

(Quota Set-Aside for Research)

DRAFT

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Mid-Atlantic Fishery Management Council

in cooperation with the

National Marine Fisheries Service

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Executive Summary

The purpose of this framework is to enable a set-aside from the annual quota (or "Total Allowable Landings") of selected species to support research and data collection activities. Those species eligible for a set-aside include:

Atlantic mackerel	Loligo squid
Black sea bass	Scup
Bluefish	Summer flounder
Butterfish	Tilefish
Illex squid	

Each year, the Mid-Atlantic Council may designate between 0% and 3% of a species' allowable landings to be set-aside. Proposals may then be submitted that respond to the Council's research priorities, and set-aside poundage awarded to projects that are selected through the designated governmental process. Currently, set-aside awards are processed through NOAA's Grants Management Division. Proceeds from the sale of set-aside quota constitute the only source of revenue available to support research under this program.

Other program specifics include:

- For those species that have both a commercial quota and a recreational harvest limit, the set-aside calculation shall be made from the combined total allowable landing level.

- It is intended that the set-aside for a given species be utilized primarily for research involving that species. However, the harvest of up to 25% of the set-aside quota from species not directly involved in a particular research project will be considered, in order to promote research in those cases where it would otherwise be infeasible.

Every effort will be made to schedule the award of set-aside poundage prior to finalizing the upcoming season's quotas. This will allow any set-aside quantities that are ultimately unneeded to be released back to their respective recreational and commercial fisheries.

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1.0. Introduction

The Mid-Atlantic Council issues this document to establish a program in which data collection projects will be funded in part through a percentage set-aside from a species' Total Allowable Landings (TAL). The purpose is to support research and the collection of additional data that may be used to improve fisheries management. The Mid-Atlantic Council wishes to encourage collaborative efforts between the public, research institutions, and government in broadening the scientific base upon which management decisions are made. Reserving a small portion of the annual harvest of a species to subsidize the research costs of vessel operations and scientific expertise is considered an important investment in the future of the nation's fisheries.

It should be stressed that any person or organization can conduct experimental programs without Council approval so long as the activity is not otherwise prohibited. Moreover, should special fishing permits be required, they can be applied for directly to NMFS without involving the Council. However, without Council approval and participation, an applicant cannot be assured that any quota set-aside for scientific use would be available to help defray project costs, or for any other legitimate use. Given the high costs of vessel operation and trained personnel, it is unlikely that quota set-asides alone will cover the entire cost of a project, and hence applicants are strongly encouraged to seek support from additional sources.

A key benefit that is sought from this program is the assurance that new data collected by non-governmental entities will receive the peer review and analysis necessary to be utilized in improving the management of public fisheries resources.

2.0. Purpose and Need for Action

2.1. Problems for Resolution

There are many issues that arise in the development of fishery management programs that have no clear resolution. Often a key factor in such cases is a lack of definitive information on the nature of a fishery resource, or a clear understanding of the impacts of human interaction with these resources. Common examples might include uncertainty as to the seaward extent

Another important factor that can erode the effectiveness of a fishery management program is a lack of confidence on the part of the fishing community that it is based on sound scientific information. Research and data collection programs are often conducted by government agencies without the direct involvement of the public, and once completed may not be adequately interpreted so that non-scientists can comprehend their results. In some cases, the results may appear to run counter to the experience that fishermen have in their daily lives harvesting fishery resources. Frequently, this is due to differences in methodology. Commercial fishermen seek to maximize the revenue from their harvests, and will operate their vessels and deploy their gear in such a way as to best accomplish this end. Scientists, conversely, are bound by the "scientific method," and seek to gain information and verify its accuracy through rigorous experimental procedures.

Management programs based on this information may then be questioned by the public, and lack credibility in their eyes. Without the active cooperation of the fishing public, most management programs are destined to fail, as it is chiefly through the actions of commercial and recreational user groups that humans interact with and affect fisheries resources.

The Mid-Atlantic Council has developed the research set-aside program to address these concerns. Through cooperative projects that make use of expertise in the fishing community as well as the research community, it is anticipated that information of strategic importance to management decisions will be obtained. When combined with a commitment to effectively communicate the results and implications of the research back out to the fishing community, it is expected that new management programs incorporating the results will have greater public support and ultimately be more effective.

2.2. Objectives

1) Facilitate the collection of data that the Council and public deem important for fishery management purposes.

2) Create a mechanism whereby the data collected can be reviewed and certified acceptable for use by NMFS scientists and those individuals involved in the fishery management process.

3.0. Preferred and Alternative Management Measures

3.1. Preferred Management Measures

3.1.1. Set-Aside Amounts

- The annual research set-aside amount may vary between 0 and 3% of each species' quota.

- For those species that have both a commercial quota and a recreational harvest limit, the set-aside calculation shall be made from the combined total allowable landing level.

3.1.2. Projects Involving More than One Species

- Individual research projects may involve multiple species, and therefore may apply for the use of more than one set-aside.

- It is intended that the set-aside for a given species be utilized primarily for research involving that species. However, the harvest of up to 25% of the set-aside quota from species not directly involved in a particular research project will be considered, in order to promote research in those cases where it would otherwise be infeasible.

3.1.3. Set-Aside Process and Schedule

- Specification of research set-aside amounts (percentages) for the coming year shall be incorporated into the Council's annual quota specification packages submitted to NMFS.

- For each proposal cycle, the Council will publish a Request for Proposals (RFP) that specifies research priorities and application procedures. Each RFP will include:

  Dates of Submission
  Eligibility Criteria
  Proposal Requirements and Format
  Research Priorities
  General Project Administration Requirements
  Evaluation Criteria
  Selection Procedures
  Interim and/or Final Report Requirements

- It is the Council's intention that, whenever possible, research proposals be reviewed and approved prior to the publication of final quota specifications for the upcoming year. In the event that the approved proposals do not make use of any or all of the set-aside for a particular species, NMFS would be authorized to release the unutilized portion back to its respective commercial and recreational fisheries when the final specifications are published.

- Proposals may request that the quota set-aside be collected separately from the research trip or other related research trip. The separate research compensation trips do not necessarily have to be conducted by the same vessel.

3.1.4. Waiving of Regulations

Vessels conducting research and data collection activities under the auspices of this program may require an exemption from selected regulations, such as closed seasons or gear requirements. In order for any regulation to be waived, an analysis must first be prepared that evaluates the impacts of that waiver. Given the large number of potential research activities that may be proposed under this program, researchers will have the responsibility of preparing impact analyses specific to their projects and the regulations they seek to have waived.

After consideration of these analyses, NMFS may issue a Letter of Authorization to vessels participating in approved projects that waive the specific regulations which would impede the lawful execution of the research.

Specific regulations that may NOT be waived include:

Reporting requirements

3.1.5. Species Eligible for Research Set-Asides

Species under management by the Mid-Atlantic Council that are eligible for research set-asides are:

Atlantic mackerel	*Scomber scombrus*
Black Sea Bass	*Centropristis striata*
Bluefish	*Pomatomus saltatrix*
Butterfish	*Peprilus triacanthus*
Illex squid	*Illex illecebrosus*

Loligo squid	*Loligo pealei*
Scup	*Stenotomus chrysops*
Summer Flounder	*Paralichthys dentatus*
Tilefish	*Lopholatilus chamaeleonticeps*

3.1.6. Project Selection Procedures

On behalf of the Council, the Comprehensive Management Committee will evaluate each research proposal based on the criteria specified in the Request For Proposals (RFP) and recommend successful applications for award of quota set-asides. NMFS must consider the Council's recommendations, and review the proposals to: 1) determine that the proposed research is in compliance with the intent and design of the governing fishery management plan; 2) approve (or disapprove) the experimental design of each proposal as being scientifically valid; 3) certify that the data generated will be of a quality and format that is acceptable for inclusion in NMFS' and ACCSP databases; and 4) determine whether a project will have sufficient impact on the environment so as to require its own Environmental Assessment.

A final review and approval will occur through the designated governmental office. Currently, set-aside awards are processed through NOAA's Grants Management Division.

Because NMFS and NOAA will take into account program policy factors such as time of year the research activities are to be conducted, administrative functions including evaluations of proposals through the Experimental Fishery Procedures contained in 50 CFR 600.745 and 648.12, and logistical concerns, projects may not be selected in the order determined by the Council. Once a particular research proposal is approved, NMFS may issue a "letter of Authorization" which details specific regulations that will be waived while an approved data collection program is being conducted.

3.1.7. Project Funding

No Federal funds are provided for research under this program. The Federal Government's contribution to projects will be a Letter of Authorization that will provide special fishing privileges in response to research proposals selected to participate in this program. The Federal Government shall not be liable for any costs incurred in the conduct a project. Any funds generated from the landings authorized in the Letter of Authorization shall be used to cover the cost of the research, including vessel costs, and to compensate vessel owners for expenses incurred. Therefore, the owner of each fishing vessel selected to land a species in excess of a trip limit or seasonal quota must use the proceeds of the sale of the excess catch to compensate the researcher for costs associated with the research activities and use of the vessel. Any additional funds above the cost of the research activities (or excess program income) shall be retained by the vessel owner as compensation for the use of his/her vessel.

The researcher's proposal must state the amount of funds required to support the research project, as well as the amount required to compensate the vessel owner either for the collection of set-aside species or for participation in the research project, or both. The proposal must also include the agreement between the vessel owner and researcher that shows exactly how the research activity is to be paid for.

3.1.8. Final Reports and Data Submission

Research and data collection projects may vary substantially in their objectives and the ultimate "products" they seek to deliver. However, there are certain requirements that all approved projects will be expected to fulfill. In general, these requirements will be specified in the published RFP, and respond to the needs of the governing administrative process. Currently, set-aside awards are processed through NOAA's Grants Management Division, and treated as a federal grant.

All approved projects will be required to submit a final report. Additionally, those projects designed to collect new data will be required to submit that data in electronic format with appropriate documentation.

3.1.8.1. Final Reports

NMFS and the Council will require project researchers to submit an interim and/or final report describing their research project results, or other acceptable deliverable(s), in a time frame that is specific to the type of research conducted. The format of the final report may vary, but must contain:

1. A brief summary of the final report;
2. A description of the issue/problem that was addressed;
3. A detailed description of methods of data collection and analyses;
4. A discussion of results and any relevant conclusions presented in a format that is understandable to a non-technical audience; this should include benefits and/or contributions to management decision-making;
5. A list of entities, firms or organizations that actually performed the work and a description

of how that was accomplished; and

6. A detailed final accounting of all funds used to conduct the research, including those provided through the research quota set-aside.

3.1.8.2. Data Submission

Projects that are designed to collect new data for inclusion in NMFS or ACCSP databases must submit the data in electronic format with appropriate documentation. Certain databases will have highly-specific requirements as to required fields and content. Researchers must agree to provide newly-collected data in a format acceptable to the administrators of the receiving database.

Documentation, or "metadata" describing the data's format, content, and idiosyncrasies must accompany any data submission.

3.2. Alternatives to Preferred Management Measures

3.2.1. Non-preferred Alternative 1: Research Quota Set-Aside Set to a Flat 1%

Initial discussions focused on specifying the research set-aside as a flat 1% of the total allowable landings for each species. This was patterned after the New England Council's specification of a 1% research set-aside for harvests of scallops in the groundfish closed areas. Further consideration brought out the fact that some species' quotas are relatively small, and that 1% of these amounts would be inadequate to sponsor research efforts. For example, the recommended 2001 quota for Tilefish was 1,760,000 lbs. One percent of this total equals 17,600 lbs, with a value of $44,000 at the 1999 average price of $2.48 per lb. Assuming the vessel and labor costs of harvesting these fish are 50% of the exvessel value, there would remain only $22,000 in "profit" available to support research.

Creating an allowable range of 0 - 3% provides the flexibility to triple that amount in the event that one or more high priority research projects are submitted.

3.2.2. Non-preferred Alternative 2: Allow for "Rapid-Response" Projects

Serious consideration was given to the concept of "rapid-response" projects, which would respond to information needs that might arise on short notice. In the event that such a situation would occur, the Council would issue a special request for proposals to address the issue in question. A fast-track submission and review process would be created to allow these "rapid-response" projects to be carried out in the shortest possible time frame.

Further consideration brought to light a number of problems that would accompany such a mechanism. The principal issue was how quota could be reserved for rapid-response projects and not be "wasted" if special needs did not arise. An example might be one where a total of 3% of a species' quota is set aside for research projects in a given year. Two percent could be dedicated to proposals approved in the normal project cycle, and one percent reserved for rapid-response projects. In order to ensure that the entire quota is utilized by the end of the year, one approach put forth was to release all quota set aside for rapid-response projects in the fourth quarter if it was not needed by the end of the third quarter.

The complicating factor in such an approach is one of equity among the various sectors in a fishery. Frequently, seasonal quotas are designed with the express purpose of allowing different sectors of the fleet equal access to a resource. For example, one species might migrate from the south to the north over the course of a year. Vessels based in the southern states would have access to the resource in the first half of the year, and the northern states would have access in the second half. Seasonal quotas that apportion the Total Allowable Landings equally to each half of the year would ensure that the southern states do not harvest the entire annual quota before the fish even arrive in the northern states.

A mechanism that would return unused research set-aside quota to only those fisheries active in the final months of the year is likely to be considered unfair by those that can only operate in other seasons.

A final concern about the feasibility of rapid-response projects related to whether the government could process them in a timely manner. So long as research quota set-asides are administered as grants, they must adhere to the requirements of the grant's process. The typical amount of time required for processing a federal grant is six months. The process starts with a 30 to 60 day interval for submission of proposals once an RFP is published in the Federal Register. The "State Federal and Constituent Programs Office" of NMFS will then initiate a technical review process requiring approximately two months. Finally, NOAA's Grants Management Division requires from 45 to 60 days to finish processing and award the grant.

Given that the intent of the Council was to enable research projects to be executed quickly with this mechanism, there appears to be a basic conflict with the timetable required for administration through the Grants program.

3.2.3. Non-preferred Alternative 3: Set-Asides Dedicated to One Species Only

This alternative would specify that the quota set-aside for a species could only be used for research that would directly involve that species. The intention is to address equity concerns that might arise if proposals seek to fund projects involving one species or gear type with the set-aside for another, seemingly unrelated species. Specifically, those individuals participating in the fisheries for high-value species such as summer flounder may feel that their set-aside is unfairly targeted as a funding source for projects that will not clearly benefit the management of their fishery.

There are two circumstances that argue against requiring a tight link between a research project and a particular species. First, research focusing on a particular gear and its behavior may have broad applicability to a number of different species. For example, a particular gear modification may improve the selectivity of one species and as a consequence reduce the discards of many others.

A second circumstance arises in those cases where a species is not very abundant, and even a full 3% quota set-aside may be insufficient to subsidize research requiring expensive vessel operations. As mentioned previously, tilefish is the most frequently cited example of a species that has important management needs, yet has a quota set-aside value that is among the lowest. Allowing a tilefish project to utilize the set-aside of another species may be the only alternative that will enable research to proceed.

Note that the preferred alternative attempts to strike a balance between the competing goals of enabling research on small populations and limiting the use of unrelated species' set-aside. It specifies that no more than 25% of a species' set-aside may be utilized by projects that do not directly involve that species.

3.2.4. Non-preferred Alternative 4: Compensation Trips Not Allowed

This alternative would prohibit the harvest of set-aside quota on separate trips from those conducting research.

The concept of "compensation trips" arose from the New England Council's scallop research program. Researchers expressed frustration at the difficulties that can arise when the needs of a research protocol conflict with the need to make a profitable fishing trip. If, for example, the commercial portion of the trip is given top priority and always conducted first, then the research component may end up being rushed if bad weather approaches, or the commercial catch needs to be landed before it spoils. A request was then made to allow the quota set-aside to be harvested on separate "compensation trips" from those conducting research. While it would not be as cost effective as a trip that can fulfill both needs on a single voyage, it would provide several key advantages.

A first advantage would be greater freedom to dedicate vessel time to the needs of each purpose. In the winter months, good weather may only be available for a few short days at a time, allowing for only one activity to be conducted. Additionally, if the commercial fishing grounds are widely separated from the location where research efforts are needed, separate trips to each location may prove to be only slightly more costly than a single trip.

A second advantage that may be gained from separating research from commercial fishing is that different vessels could be used for each activity. Vessels that are already rigged with the equipment best suited to the needs of each activity could be selected, and contracted separately.

The primary reason put forth to prohibit compensation trips would be to discourage financial misconduct. The potential exists for proposals to be submitted and set-aside quota harvested without a serious intention to conduct research. The fact that the set-aside could be harvested without scientific personnel or observers on board simply makes such conduct slightly easier.

It is not considered likely that researchers or vessel owners would risk their reputations by engaging in such behavior. At the very least, they would be barred from further participation in federal grant programs.

3.2.5. Non-preferred Alternative 5: Compensation Trips Allowed with Funds Held in Escrow Account

This alternative would allow for compensation trips, yet require that the proceeds from the sale of set-aside quota be deposited in an escrow account. An independent, third party would be responsible for disbursing funds to researchers and reimbursing vessel owners for the costs of harvesting the set-aside quota. Involving an third party in the financial management of the project may decrease the likelihood of misconduct. The third party would be selected through a bidding process, and would most likely be an accounting firm or non-profit agency.

The reason this measure was not selected as part of the preferred alternative is because it would add significantly to the administrative overhead of the program. Administrative costs would be higher, given that the third party agency would be compensated for its services, and implementation times would be longer.

In contrast to the research program being conducted in New England, the Mid-Atlantic effort has no cash grants available to it. The entire support must take the form of access to certain fisheries resources, and the potential relaxation of selected fisheries regulations. Revenue generated from the sale of set-aside fish must first cover the costs of harvesting them, with perhaps one-half of the gross sales value available to support research. Under these conditions, it is possible that interest in the Mid-Atlantic research program may be modest. At this time, therefore, it is not recommended that the program be further burdened with the costs of administering an escrow fund.

3.2.6. Non-preferred Alternative 6: ITQ Fisheries Are Eligible for a Set-Aside

This alternative would enable a research quota set-aside for the surfclam and ocean quahog fisheries managed by Individual Transferable Quotas (ITQ).

The Mid-Atlantic Council is not recommending such a measure be included in the framework amendment at this time. The primary reason for this position is the fact that industry has been voluntarily supporting surfclam and ocean quahog research for several years. Vessel time and quota have been donated to conduct depletion studies and dredge efficiency estimates. Government and academic scientists have worked cooperatively in these efforts, which have included side-by-side tows made by industry and government vessels.

Industry representatives have expressed a preference that these efforts continue to be voluntary, rather than obligatory through a new research set-aside program. Given the industry's history of voluntary contributions to research in these fisheries, the Council is inclined to support their request.

4.0. Environmental Assessment

This Environmental Assessment (EA) presents an analysis of the impacts on the environment of the preferred and alternative actions considered in this framework. The purpose of the framework is to enable a set-aside from the annual quota (or "Total Allowable Landings") of selected species to support research and data collection activities. A detailed description of the alternatives considered for this action is presented in Section 3.0. Descriptions of the commercial and recreational fisheries for each species can be found in the respective Fishery Management Plans and subsequent amendments. The most recent status information is available in the submission package prepared by the Council when recommending annual quotas for each species to NMFS.

Extensive information on port communities and their dependence on these fishery resources can be found in two reports sponsored by the Mid-Atlantic Council: Fishing Ports of the Mid-Atlantic (McCay and Cieri 2000), and Report, Part 2, Phase I, Fishery Impact Management Project to the Mid-Atlantic Fishery Management Council (McCay, et. al. 1993).

The framework itself does not contain any measures that directly impact the environment. It simply creates an administrative mechanism whereby a small portion of the annual harvest from a stock of fish can be held in reserve. In any given year, that reserve may be set as high as 3% of the Total Allowable Landings, or may be foregone with a set-aside of 0%.

Members of the public and research community will be encouraged to respond to Requests for Proposals (RFPs) with projects that can provide information useful to the management of these fisheries resources. Proceeds from the sale of set-aside quota constitute the only source of revenue available to support research under this program.

The environmental impacts of any proposed research project will be evaluated on a case-by-case basis. The impacts of removing the total set-aside poundage from a stock will be evaluated and accounted for as part of the annual quota specifications put forth by the Mid-Atlantic Council. The remaining factors that have the potential of affecting the environment include the type of gear to be used in the research, and the season, manner, and location in which it will be employed. None of these factors can be anticipated prior to the actual submission of proposals.

Consequently, as part of the review process for all proposals submitted, the National Marine Fisheries Service will make a determination as to whether a project will require an

Environmental Assessment of its own. If a project is determined to require an EA, the sponsors of the project will be responsible for its preparation.

4.1. Essential Fish Habitat Assessment

Text Descriptions of Essential Fish Habitat of Included MAFMC Species

The following are text descriptions of essential fish habitat for each Mid-Atlantic Council species included in the Quota Set-Aside Framework, as presented in section 2.2.2.2 of each SFA Amendment. Figures and tables referenced within each description can be found in the individual FMPs. Information used to determine EFH for each species is presented in section 2.2.1 of each SFA Amendment.

4.1.1. Summer flounder

Source: Amendment 12 to the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan, pp. 64-67.

Eggs: 1) North of Cape Hatteras, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all the ranked ten-minute squares for the area where summer flounder eggs are collected in the MARMAP survey (Figure 47a). 2) South of Cape Hatteras, EFH is the waters over the Continental Shelf (from the coast out to the limits of the EEZ), from Cape Hatteras, North Carolina to Cape Canaveral, Florida, to depths of 360 ft (Figure 46). In general, summer flounder eggs are found between October and May, being most abundant between Cape Cod and Cape Hatteras, with the heaviest concentrations within 9 miles of shore off New Jersey and New York. Eggs are most commonly collected at depths of 30 to 360 ft.

Larvae: 1) North of Cape Hatteras, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all the ranked ten-minute squares for the area where summer flounder larvae are collected in the MARMAP survey (Figure 47b). 2) South of Cape Hatteras, EFH is the nearshore waters of the Continental Shelf (from the coast out to the limits of the EEZ), from Cape Hatteras, North Carolina to Cape Canaveral Florida, in nearshore waters (out to 50 miles from shore; Figure 46). 3) Inshore, EFH is all the estuaries where summer flounder were identified as being present (rare, common, abundant, or highly abundant) in the ELMR database (Table 14), in the "mixing" (defined in ELMR as 0.5 to 25.0 ppt) and "seawater" (defined in ELMR as greater than 25 ppt) salinity zones (Figure 36). In general, summer flounder larvae are most abundant nearshore (12-50 miles from shore) at depths between 30 to 230 ft. They are most frequently found in the northern part of the Mid-Atlantic Bight from September to February, and in the southern part from November to May.

Juveniles: 1) North of Cape Hatteras, EFH is the demersal waters over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all the ranked ten-minute squares for the area where juvenile summer flounder are collected in the NEFSC trawl survey (Figure 47c). 2) South of Cape Hatteras, EFH is the waters over the Continental Shelf (from the coast out to the limits of the EEZ) to depths of 500 ft, from Cape Hatteras, North Carolina to Cape Canaveral, Florida (Figure 46). 3) Inshore, EFH is all of the estuaries where summer flounder were identified as being present (rare, common, abundant, or highly abundant) in the ELMR database (Table 14) for the "mixing" and "seawater" salinity zones (Figure 36). In general, juveniles use several estuarine habitats as nursery areas, including salt marsh creeks, seagrass beds, mudflats, and open bay areas in water temperatures greater than 37°F and salinities from 10 to 30 ppt range.

Adults: 1) North of Cape Hatteras, EFH is the demersal waters over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all the ranked ten-minute squares for the area where adult summer flounder are collected in the NEFSC trawl survey (Figure 47d). 2) South of Cape Hatteras, EFH is the waters over the Continental Shelf (from the coast out to the limits of the EEZ) to depths of 500 ft, from Cape Hatteras, North Carolina to Cape Canaveral, Florida (Figure 46). 3) Inshore, EFH is the estuaries where summer flounder were identified as being common, abundant, or highly abundant in the ELMR database (Table 14) for the "mixing" and "seawater" salinity zones (Figure 36). Generally summer flounder inhabit shallow coastal and estuarine waters during warmer months and move offshore on the outer Continental Shelf at depths of 500 ft in colder months.

4.1.2. Scup

Eggs: EFH is estuaries where scup eggs were identified as common, abundant, or highly abundant in the ELMR database (Table 15) for the "mixing" and "seawater" salinity zones (Figure 36). In general scup eggs are found from May through August in southern New England to coastal Virginia, in waters between 55 and 73°F and in salinities greater than 15 ppt.

Larvae: EFH is estuaries where scup were identified as common, abundant, or highly abundant in the ELMR database (Table 15) for the "mixing" and "seawater" salinity zones (Figure 36). In general scup larvae are most abundant nearshore from May through September, in waters between 55 and 73°F and in salinities greater than 15 ppt.

Juveniles: 1) Offshore, EFH is the demersal waters over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all the ranked ten-minute squares of the area where juvenile scup are collected in the NEFSC trawl survey (Figure 48a). 2) Inshore, EFH is the estuaries where scup are identified as being common, abundant, or highly abundant in the ELMR database (Table 15) for the "mixing" and "seawater" salinity zones (Figure 36). Juvenile scup, in general during the summer and spring are found in estuaries and bays between Virginia and Massachusetts, in association with various sands, mud, mussel and eelgrass bed type substrates and in water temperatures greater than 45°F and salinities greater than 15 ppt.

Adults: 1) Offshore, EFH is the demersal waters over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all the ranked ten-minute squares of the area where adult scup are collected in the NEFSC trawl survey (Figure 48b). 2) Inshore, EFH is the estuaries where scup were identified as being common, abundant, or highly abundant in the ELMR database (Tables 15) for the "mixing" and "seawater" salinity zones (Figure 36). Generally, wintering adults (November through April) are usually offshore, south of New York to North Carolina, in waters above 45°F.

4.1.3. Black sea bass

Eggs: EFH is the estuaries where black sea bass eggs were identified in the ELMR database as common, abundant, or highly abundant (Table 16) for the "mixing" and "seawater" salinity zones (Figure 36). Generally, black sea bass eggs are found from May through October on the Continental Shelf, from southern New England to North Carolina.

Larvae: 1) North of Cape Hatteras, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all ranked ten-minute squares of the area where black sea bass larvae are collected in the MARMAP survey (Figure 49a). 2) EFH also is estuaries where black sea bass were identified as common, abundant, or highly abundant in the ELMR database (Table 16) for the "mixing" and "seawater" salinity zones (Figure 36). Generally, the habitats for the transforming (to juveniles) larvae are near the coastal areas and into marine parts of estuaries between Virginia and New York. When larvae become demersal, they are generally found on structured inshore habitat such as sponge beds.

Juveniles: 1) Offshore, EFH is the demersal waters over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all the ranked squares of the area where juvenile black sea bass are collected in the NEFSC trawl survey (Figure 49b). 2) Inshore, EFH is the estuaries where black sea bass are identified as being common, abundant, or highly abundant in the ELMR database (Table 16) for the "mixing" and "seawater" salinity zones (Figure 36). Juveniles are found in the estuaries in the summer and spring. Generally, juvenile black sea bass are found in waters warmer than 43°F with salinities greater than 18 ppt and coastal areas between Virginia and Massachusetts, but winter offshore from New Jersey and south. Juvenile black sea bass are usually found in association with rough bottom, shellfish and eelgrass beds, man-made structures in sandy-shelly areas; offshore clam beds and shell patches may also be used during the wintering.

Adults: 1) Offshore, EFH is the demersal waters over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all the ranked ten-minute squares of the area where adult black sea bass are collected in the NEFSC trawl survey (Figure 49c). 2) Inshore, EFH is the estuaries where adult black sea bass were identified as being common, abundant, or highly abundant in the ELMR database (Table 16) for the "mixing" and "seawater" salinity zones (Figure 36). Black sea bass are generally found in estuaries from May through October. Wintering adults (November through April) are generally offshore, south of New York to North Carolina. Temperatures above 43°F seem to be the minimum requirements. Structured habitats (natural and man-made), sand and shell are usually the substrate preference.

4.1.4. Bluefish

Source: Amendment 1 to the Bluefish Fishery Management Plan, Volume 1, pp. 45-46

Eggs: 1) North of Cape Hatteras, EFH is pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ) at mid-shelf depths, from Montauk Point, NY south to Cape Hatteras in the highest 90% of the area where bluefish eggs were collected in the MARMAP surveys (Figure 26). 2) South of Cape Hatteras, EFH is 100% of the pelagic waters over the Continental Shelf (from the coast out to the eastern wall of the Gulf Stream) through Key West, Florida at mid-shelf depths (Figure 25). Bluefish eggs are generally not collected in estuarine waters and thus there is no EFH designation inshore. Generally, bluefish eggs are collected between April through August in temperatures greater than 64°F (18°C) and normal shelf salinities (>31 ppt).

Larvae: 1) North of Cape Hatteras, EFH is pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ) most commonly above 49 ft (15 m), from Montauk Point, New York south to Cape Hatteras, in the highest 90% of the area where bluefish larvae were collected during the MARMAP surveys (Figure 27). 2) South of Cape Hatteras, EFH is 100% of the pelagic waters greater than 45 feet over the Continental Shelf (from the coast out to the eastern wall of the Gulf Stream) through Key West, Florida (Figure 25). 3) EFH also includes the "slope sea" and Gulf Stream between latitudes 29° 00 N and 40° 00 N (Figure 5). Bluefish larvae are not generally collected inshore so there is not EFH designation inshore for larvae. Generally, bluefish larvae are collected April through September in temperatures greater than 64°F (18°C) in normal shelf salinities (>30 ppt).

Juveniles: 1) North of Cape Hatteras, EFH is pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ) from Nantucket Island, Massachusetts south to Cape Hatteras, in the highest 90% of the area where juvenile bluefish are collected in the NEFSC trawl survey (Figure 28). 2) South of Cape Hatteras, EFH is 100% of the pelagic waters over the Continental Shelf (from the coast out to the eastern wall of the Gulf Stream) through Key West, Florida (Figure 25). 3) EFH also includes the "slope sea" and Gulf Stream between latitudes 29o 00 N and 40o 00 N (Figure 5). 4) Inshore, EFH is all major estuaries between Penobscot Bay, Maine and St. Johns River, Florida in Table 10 (Figure 16). Generally juvenile bluefish occur in North Atlantic estuaries from June through October, Mid-Atlantic estuaries from May through October, and South Atlantic estuaries March through December, within the "mixing" and "seawater" zones (Nelson et al. 1991, Jury et al. 1994, Stone et al. 1994). Distribution of juveniles by temperature, salinity, and depth over the continental shelf is undescribed (Fahay 1998).

Adults: 1) North of Cape Hatteras, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from Cape Cod Bay, Massachusetts south to Cape Hatteras, in the highest 90% of the area where adult bluefish were collected in the NEFSC trawl survey (Figure 29). 2) South of Cape Hatteras, EFH is 100% of the pelagic waters over the Continental Shelf (from the coast out to the eastern wall of the Gulf Stream) through Key West, Florida (Figure 25). 3) Inshore, EFH is all major estuaries between Penobscot Bay, Maine and St. Johns River, Florida in Table 10 (Figure 17). Adult bluefish are found in North Atlantic estuaries from June through October, Mid-Atlantic estuaries from April through October, and in South Atlantic estuaries from May through January in the "mixing" and "seawater" zones (Nelson et al. 1991, Jury et al. 1994, Stone et al. 1994). Bluefish adults are highly migratory and distribution varies seasonally and according to the size of the individuals comprising the schools. Bluefish are generally found in normal shelf salinities (> 25 ppt).

4.1.5. Atlantic mackerel

Source: Amendment 8 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan, pp. 53-56

Eggs: Offshore, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from Maine through Cape Hatteras, North Carolina in areas that comprise the highest 75% of the catch where Atlantic mackerel eggs were collected in MARMAP ichthyoplankton surveys (Figure 53a). Inshore, EFH is the "mixing" and/or "seawater" portions of all the estuaries where Atlantic mackerel eggs are "common," "abundant," or "highly abundant" on the Atlantic coast, from Passamaquoddy Bay, Maine to James River, Virginia (Table 13; Figures 13a, 44). Generally, Atlantic mackerel eggs are collected from shore to 50 ft and temperatures between 41°F and 73°F.

Larvae: Offshore, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina that comprise the highest 75% of the catch where Atlantic mackerel larvae were collected in the MARMAP ichthyoplankton survey (Figure 53b). Inshore, EFH is also the "mixing" and/or "seawater" portions of all the estuaries where Atlantic mackerel larvae are "common," "abundant," or "highly abundant" on the Atlantic coast, from Passamaquoddy Bay, Maine to James River, Virginia (Table 13; Figures 13b, 44). Generally, Atlantic mackerel larvae are collected in depths between 33 ft and 425 ft and temperatures between 43°F and 72°F.

Juveniles: Offshore, EFH is the pelagic water found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina in areas that comprise the highest 75% of the catch where juvenile Atlantic mackerel were collected in the NEFSC trawl surveys (Figure 53c). Inshore, EFH is the "mixing" and/or "seawater" portions of all the estuaries where juvenile Atlantic mackerel are "common," "abundant," or "highly abundant" on the Atlantic coast, from Passamaquoddy Bay, Maine to James River, Virginia (Table 13; Figures 13c, 44). Generally, juvenile Atlantic mackerel are collected from shore to 1,050 ft and temperatures between 39°F and 72°F.

Adults: Offshore, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North

Carolina, in areas that comprise the highest 75% of the catch where adult Atlantic mackerel were collected in the NEFSC trawl surveys (Figure 53d). Inshore, EFH is the "mixing" and/or "seawater" portions of all the estuaries where adult Atlantic mackerel are "common," "abundant," or "highly abundant" on the Atlantic coast, from Passamaquoddy Bay, Maine to James River, Virginia (Table 13; Figures 13d, 44). Generally, adult Atlantic mackerel are collected from shore to 1,250 ft and temperatures between 39°F and 61°F.

4.1.6. Loligo

Pre-recruits: EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina in areas that comprise the highest 75% of the catch where pre-recruit Loligo were collected in the NEFSC trawl surveys (Figure 54a). Generally, pre-recruit Loligo are collected from shore to 700 ft and temperatures between 39°F and 81°F.

Recruits: EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina in areas that comprise the highest 75% of the catch where recruited Loligo were collected in the NEFSC trawl surveys (Figure 54b). Generally, recruited Loligo are collected from shore to 1,000 ft and temperatures between 39°F and 81°F.

Pre-recruits and recruits are stock assessment terms used by NEFSC and correspond roughly to the life history stages juveniles and adults, respectively. Loligo pre-recruits are less than or equal to 8 cm and recruits are greater than 8 cm.

4.1.7. Illex

Pre-recruits: EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina in areas that comprise the highest 75% of the catch where pre-recruit Illex were collected in the NEFSC trawl surveys (Figure 55a). Generally, pre-recruit Illex are collected from shore to 600 ft and temperatures between 36°F and 73°F.

Recruits: EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina in areas that comprise the highest 75% of the catch where recruited Illex were collected in the NEFSC trawl surveys (Figure 55b). Generally, recruited Illex are collected from shore to 600 ft and temperatures between 39°F and 66°F.

Pre-recruits and recruits are stock assessment terms used by NEFSC and correspond roughly to the life history stages juveniles and adults, respectively. Illex pre-recruits are less than or equal to 10 cm and recruits are greater than 10 cm.

4.1.8. Butterfish

Eggs: Offshore, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina in areas that comprise the highest 75% of the catch where butterfish eggs were collected in MARMAP ichthyoplankton surveys (Figure 56a). Inshore, EFH is the "mixing" and/or "seawater" portions of all the estuaries where butterfish eggs are "common," "abundant," or "highly abundant" on the Atlantic coast, from Passamaquoddy Bay, Maine to James River, Virginia (Table 14; Figures 43a, 44). Generally, butterfish eggs are collected from shore to 6,000 ft and temperatures between 52°F and 63°F.

Larvae: Offshore, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina areas that comprise the highest 75% of the catch where butterfish larvae were collected in the NEFSC trawl surveys (Figure 56). Inshore, EFH is the "mixing" and/or "seawater" portions of all the estuaries where butterfish larvae are "common," "abundant," or "highly abundant" on the Atlantic coast, from Passamaquoddy Bay, Maine to James River, Virginia (Table 14; Figures 43b, 44). Generally, butterfish larvae are collected in depths between 33 ft and 6,000 ft and temperatures between 48°F and 66°F.

Juveniles: Offshore, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina in areas that comprise the highest 75% of the catch where juvenile butterfish were collected in the NEFSC trawl surveys (Figure 56c). Inshore, EFH is the "mixing" and/or "seawater" portions of all the estuaries where juvenile butterfish are "common," "abundant," or "highly abundant" on the Atlantic coast, from Passamaquoddy Bay, Maine to James River, Virginia (Table 14; Figures 43c, 44). Generally, juvenile butterfish are collected in depths between 33 ft and 1,200 ft and temperatures between 37°F and 82°F.

Adults: Offshore, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina in areas that comprise the highest 75% of the catch where adult butterfish were collected in the NEFSC trawl surveys (Figure 56d). Inshore, EFH is the "mixing" and/or "seawater" portions of all the estuaries where adult butterfish are "common," "abundant," or "highly abundant" on the Atlantic coast, from Passamaquoddy Bay, Maine to James River, Virginia (Table 14; Figures 43d, 44). Generally, adult butterfish are collected in depths between 33 ft and 1,200 ft and temperatures between 37°F and 82°F.

4.1.9. Tilefish

Source: Tilefish Fishery Management Plan. Final draft submitted for Secretarial approval Nov. 2000, pp. 42-43.

Eggs and Larvae: Tilefish eggs and larvae have EFH identified as the water column between the 250 and 1,200 foot isobath, from United States/ Canadian boundary to the Virginia/North Carolina boundary (Figure 4). Tilefish eggs and larvae are generally found in water temperatures from 46-66°F.

Juveniles and Adults: Tilefish juveniles and adults have EFH identified as benthic waters and substrate between the 250 and 1200 ft isobath, from United States/ Canadian boundary to the Virginia/North Carolina boundary (Figure 4). Tilefish are generally found in rough bottom, small burrows and sheltered areas in water temperatures from 46-64°F.

The definition for tilefish Habitat Areas of Particular Concern (HAPC) is as follows:

HAPC for juvenile and adult tilefish is substrate between the 250 and 1,200 ft isobath within statistical areas 616 and 537.

5.0. Regulatory Impact Review

5.1. Introduction

The National Marine Fisheries Service (NMFS) requires the preparation of a Regulatory Impact Review (RIR) for all regulatory actions that either implement a new Fishery Management Plan (FMP) or significantly amend an existing plan or regulation. The RIR is part of the process of preparing and reviewing FMPs and provides a comprehensive review of the changes in net economic benefits to society associated with proposed regulatory actions. The analysis also provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problems. The purpose of the analysis is to ensure that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost-effective way.

The RIR addresses many items in the regulatory philosophy and principles of Executive Order (E.O.) 12866. The RIR also serves as the basis for determining whether any proposed regulation is a "significant regulatory action" under certain criteria provided in E.O. 12866.

5.2. Management Objectives

The purpose of the framework is to enable a set-aside from the annual quota (or "Total Allowable Landings") of selected species to support research and data collection activities. As stated in Section 2.2., the specific objectives are to:

1) Facilitate the collection of data that the Council and public deem important for fishery management purposes.

2) Create a mechanism whereby the data collected can be reviewed and certified acceptable for use by NMFS scientists and those individuals involved in the fishery management process.

5.3. Description of the Affected Fisheries

This action is intended to apply to selected fisheries under management by the Mid-Atlantic Fishery Management Council. Current exceptions consist of the surfclam and ocean quahog fisheries which utilize Individual Transferable Quotas (ITQs), and Dogfish, which is a joint plan with the New England Fishery Management Council. The nine species eligible for quota set-asides are:

Atlantic mackerel	*Scomber scombrus*
Black Sea Bass	*Centropristis striata*
Bluefish	*Pomatomus saltatrix*
Butterfish	*Peprilus triacanthus*
Illex squid	*Illex illecebrosus*
Loligo squid	*Loligo pealei*

Scup	*Stenotomus chrysops*
Summer Flounder	*Paralichthys dentatus*
Tilefish	*Lopholatilus chamaeleonticeps*

Descriptions of the commercial and recreational fisheries for each species can be found in the respective Fishery Management Plans and subsequent amendments. The most recent status information is available in the submission package prepared by the Council when recommending annual quotas for each species to NMFS.

Extensive information on port communities and their dependence on these fishery resources can be found in two reports sponsored by the Mid-Atlantic Council: Fishing Ports of the Mid-Atlantic (McCay and Cieri 2000), and Report, Part 2, Phase I, Fishery Impact Management Project to the Mid-Atlantic Fishery Management Council (McCay, et. al. 1993).

5.4. Problem Statement

A description of the problems addressed by this action is presented in Section 2.1.

5.5. Management Alternatives

A detailed description of the alternatives considered for this action is presented in Section 3.0. They can be summarized as follows:

3.0. PREFERRED AND ALTERNATIVE MANAGEMENT MEASURES
- 3.1. Preferred Management Measures
  - 3.1.1. Set-Aside Amounts
  - 3.1.2. Projects Involving More than One Species
  - 3.1.3. Set-Aside Process and Schedule
  - 3.1.4. Waiving of Regulations
  - 3.1.5. Species Eligible for Research Set-Asides
  - 3.1.6. Project Selection Procedures
  - 3.1.7. Project Funding
  - 3.1.8. Final Reports and Data Submission
- 3.2. Alternatives to Preferred Management Measures
  - 3.2.1. Non-preferred Alternative 1: Quota Set-Aside Set to a Flat 1%
  - 3.2.2. Non-preferred Alternative 2: Allow for "Rapid-Response" Projects
  - 3.2.3. Non-preferred Alternative 3: Set-Asides Dedicated to One Species Only

3.2.4. Non-preferred Alternative 4: Compensation Trips Not Allowed
3.2.5. Non-preferred Alternative 5: Compensation Trips Allowed with Funds Held in Escrow Account
3.2.6. Non-preferred Alternative 6: ITQ Fisheries Are Eligible for a Set-Aside

5.6. Analysis of Alternatives

This framework action represents an unusual case in that it does not contain any measures that directly impact the fishing public. It simply creates an administrative mechanism whereby a small portion of the annual harvest from a stock of fish can be held in reserve. No impacts can result unless further governmental actions are taken to invoke the set-aside. In any given year, that reserve may be set as high as 3% of the Total Allowable Landings, or may be foregone with a set-aside of 0%.

The alternatives to the recommended action are essentially administrative or programmatic in nature. The traditional measures of economic impact, such as changes in consumer or producer surplus, are not relevant to potential changes in a program's administration. Whether "rapid response" projects are allowed, for example, does not have a direct bearing on exvessel prices or harvest costs borne by the public at large.

The principal economic impacts that can be evaluated relate to whether the program is implemented or not, and if it is implemented, what are the likely consequences of diverting 1%, 2%, or 3% of harvests to support research and data collection. In the following sections, areas of "no impact" will be discussed first, followed by those that would be affected from implementation of a set-aside program.

5.6.1. Items Not Impacted by a Set-Aside Program

5.6.1.1. Total Landings

The Total Allowable Landings of any given species should not be altered by the set-aside program. Annual quota determinations will continue to be made as they have in the past. The Total Allowable Landings will still come ashore each year. The difference is simply that set-aside quantities may only be harvested by authorized sponsors of approved research and data collection projects. Revenue from the sale of these fish will be used to cover the cost of their harvest, as well as the costs of research operations, personnel, and equipment.

5.6.1.2. Exvessel Prices

Exvessel prices of fish are not expected to change significantly from the implementation of a set-aside program. Overall quantities landed should be approximately the same.

It is likely that research activities will make a small quantity of fish unsaleable, such as those individuals that are dissected. Additionally, if the vessel is at sea for an extended time, the freshness of those fish caught earlier in the trip may have declined.

5.6.1.3. Harvest Costs

In general, industry harvest costs should not be impacted by a set-aside program. Vessels will not be obliged to operate in a less-efficient manner.

The profitability of harvest operations will be impacted slightly from the reduced quantities of fish available to the general public. This aspect will be examined in detail in subsequent sections.

5.6.1.4. Consumer Surplus and Consumer Prices

Benefit-cost analysis is conducted to evaluate the net social benefit arising from changes in consumer and producer surpluses that are expected to occur upon implementation of a regulatory action. Total Consumer Surplus (CS) is the difference between the amounts consumers are willing to pay for products or services and the amounts they actually pay. Thus CS represents net benefits to consumers. When the information necessary to plot the supply and demand curves for a particular commodity is available, consumer surplus is represented by the area that is below the demand curve and above the market clearing price where the two curves intersect. Due to lack of an empirical model for these fisheries and knowledge of elasticities of supply and demand, a qualitative approach to the economic assessment was adopted. Nevertheless, quantitative measures are provided whenever possible.

A quota set-aside program is not expected to have any significant impact on consumer markets or prices. The quantities landed should be similar to those landed in the absence of a set-aside program.

5.6.1.5. Distributive Impacts

Distributive impacts from a regulatory action are those that fall unequally among the affected groups. The quota set-aside program enabled by this framework would impact all user groups equally, as the set-aside quantity would come "off-the-top" of the Total Allowable Landings. Any allocations to commercial or recreational user groups would come after the set-aside was deducted.

5.6.2. Items Impacted by a Set-Aside Program

5.6.2.1. Producer Surplus and Net Revenue

Net benefit to producers is producer surplus (PS). Total PS is the difference between the amounts producers actually receive for providing goods and services and the economic cost producers bear to do so. Graphically, it is the area above the supply curve and below the market clearing price where supply and demand intersect. Economic costs are measured by the opportunity cost of all resources including the raw materials, physical and human capital used in the process of supplying these goods and services to consumers.

In the case of a quota set-aside program, a small portion of the profit from fishery resources is diverted to subsidize research and data collection. Section 5.6.3 will examine the commercial and recreational fisheries for each species, and evaluate the impacts that a set-aside of up to 3% may have on each.

What is important to note here is that set-aside reductions should not be viewed simply as a small percentage loss to the user community. A well-executed research program that is subsidized through set-aside poundage may be viewed as an investment in the future of those fisheries. An improved understanding of a species' population dynamics and interactions with fishing gear can support targeted management measures that have fewer unintended consequences and improve yields in future years.

5.6.2.2. Administrative Costs

Administration of a new research program subsidized through quota set-asides will impose new costs upon the federal government. A major component will be the time of government scientists allocated to the review of research proposals. Additional costs will be incurred for general programmatic oversight and administration.

Governmental entities that will contribute staff support include:

- Mid-Atlantic Fisheries Management Council, Dover, DE
- NMFS Regional Office in Gloucester, MA
  - Sustainable Fisheries Division
  - State Federal and Constituent Programs Office
  - Office of the General Council
- NMFS Northeast Fisheries Science Center, Woods Hole, MA
- NOAA's Grants Management Division, Silver Spring, MD

Demands of the program are likely to be higher at the outset, while routines and procedures are being ironed out. Subsequent, recurring costs are likely to be directly proportional to the number of project applications submitted.

5.6.2.3. Enforcement Costs

One of the more visible costs to society of fisheries regulation is that of enforcement. From a budgetary perspective, the cost of enforcement is equivalent to the total public expenditure devoted to enforcement. However, the economic cost of enforcement is measured by the opportunity cost of devoting resources to enforcement vis à vis some other public or private use and/or by the opportunity cost of diverting enforcement resources from one fishery to another.

It is not anticipated that the set-aside program will require a major investment of enforcement resources. Some oversight of at-sea operations is expected to be provided by observers and scientists involved in the research. However, some research operations will likely include activities that would otherwise be prohibited. Enforcement officials from NMFS and the Coast Guard will need to provide some oversight to ensure the privileges accorded to research projects are not exceeded.

5.6.3. Set-Aside Impacts on Individual Fisheries

The following sections will evaluate the impacts of a 1%, 2%, or 3% set-aside on the commercial and recreational fisheries for each species. Commercial landings data are primarily from the National Marine Fisheries Service Commercial Fisheries database. This database contains comprehensive data for the states of Maine through Virginia, but only partial data for North Carolina.

The first table of information under each species' section is derived from the NMFS database. The "Number of Vessels" column must be considered a minimum estimate for the number of distinct vessels that landed in each state, as some of the landings data submitted by the states cannot be attributed to an individual vessel. Additionally, while the "Number of Vessels" figures accurately reflect the number of identifiable vessels landing in each state, they cannot be summed across states because some vessels land in more than one state. For this reason, a separate "Min # of Distinct Vessels" figure is supplied which counts each vessel only once across all states in the database.

Comprehensive landings and vessel participation data for North Carolina was obtained from the NC Commercial Trip Ticket program. It is summary data, and cannot be combined with the NMFS data because it is not possible to identify unique numbers of vessels between them. Hence, the NMFS and North Carolina commercial landings data are presented separately for each species.

In order to estimate the potential impacts of a 1%, 2%, or 3% set-aside on the commercial fisheries for each species, these quantities were calculated for the landed value of each species in 1999. Then, an "Average Value per Vessel" is calculated by dividing the "Min # of Distinct Vessels" by the 1%, 2%, and 3% figures. These values represent the revenue that would have been foregone by an average commercial vessel due to a quota set-aside at each level.

Recreational harvest estimates were also obtained for each species in 1999 from the Marine Recreational Fisheries Statistics Survey. While the value of foregone harvests are not easily determined in the recreational sector, estimates for poundage (A + B1 fish) and numbers of trips targeting each species were available.

In an attempt to parallel the commercial evaluation as much as possible, the poundage represented by a 1%, 2% or 3% set-aside was calculated, and then divided by numbers of trips in order to estimate the poundage that would be foregone by an average vessel on any given trip. For all the recreationally-harvested species eligible for a set-aside (bluefish, summer flounder, scup, black sea bass, and Atlantic mackerel), the numbers of trips taken are sufficiently large that the average pounds per trip forgone does not exceed 0.5 for any species.

5.6.3.1. Bluefish Impacts

1999 Commercial Bluefish Landings by State

Includes: All landings from Maine - Virginia, partial landings for North Carolina, and Florida East Coast

State	Number of Vessels	Landed Pounds	Landed Value ($)	1% of Value ($)	2% of Value ($)	3% of Value ($)
Maine & New Hampshire	22	11,161	5,313	53	106	159
Massachusetts	222	408,949	171,012	1,710	3,420	5,130
Rhode Island & Conn.	151	623,504	238,208	2,382	4,764	7,146
New York	214	1,423,726	741,132	7,411	14,823	22,234
New Jersey	148	1,082,310	466,025	4,660	9,321	13,981
Delaware & Maryland	24	170,095	52,321	523	1,046	1,570
Virginia	90	491,800	148,188	1,482	2,964	4,446
North Carolina	117	2,268,404	706,555	7,066	14,131	21,197
Florida East Coast	136	346,401	104,017	1,040	2,080	3,121
Total		6,826,350	2,632,771	26,328	52,655	78,983
Min. # of Distinct Vessels	1,005					
Average Value per Vessel				**26**	**52**	**79**

Source: NMFS Commercial Fisheries (Weighout) Data and Florida Fish and Wildlife Conservation Commission

North Carolina Commercial Trip Ticket Program	Number of Vessels	Landed Pounds	Landed Value ($)	1% of Value ($)	2% of Value ($)	3% of Value ($)
Bluefish	941	2,759,697	877,543	8,775	17,551	26,326
Average Value per Vessel				**9**	**19**	**28**

Source: NC Division of Marine Fisheries

1999 Bluefish Recreational Harvests by State
A (landed) + B1 (discarded) fish
Source: MRFSS Web Query on 12-7-2000

State	Pounds Caught	Proportional Std. Error	1% of Pounds	2% of Pounds	3% of Pounds
Maine	28,135	35.7	281	563	844
New Hampshire	33,054	40.8	331	661	992
Massachusetts	700,820	19.3	7,008	14,016	21,025
Rhode Island	837,785	23.3	8,378	16,756	25,134
Connecticut	910,923	20.0	9,109	18,218	27,328
New York	1,137,624	15.6	11,376	22,752	34,129
New Jersey	3,159,736	50.8	31,597	63,195	94,792
Delaware	92,051	19.3	921	1,841	2,762
Maryland	358,020	25.0	3,580	7,160	10,741
Virginia	212,537	29.2	2,125	4,251	6,376
North Carolina	421,180	13.0	4,212	8,424	12,635
South Carolina	20,335	44.6	203	407	610
Georgia	8,657	37.7	87	173	260
East Florida	332,255	12.9	3,323	6,645	9,968
Total	8,253,112		82,531	165,062	247,593
No. Trips Targeting	1,316,939				
Average Lbs/Trip			**0.06**	**0.13**	**0.19**

Source: MRFSS Web Query on 12-7-2000

5.6.3.2. Summer Flounder Impacts

1999 Summer Flounder Commercial Landings by State

Includes: All landings from Maine - Virginia, and partial landings for North Carolina

State	Number of Vessels	Landed Pounds	Landed Value ($)	1% of Value ($)	2% of Value ($)	3% of Value ($)
Maine & Massachusetts	237	810,961	1,636,690	16,367	32,734	49,101
Rhode Island & Conn.	199	1,881,747	4,347,318	43,473	86,946	130,420
New York	152	803,903	1,837,474	18,375	36,749	55,124
New Jersey	168	1,917,732	3,039,898	30,399	60,798	91,197
Delaware	3	7,917	16,787	168	336	504
Maryland	22	234,358	472,189	4,722	9,444	14,166
Virginia	133	2,195,832	3,066,806	30,668	61,336	92,004
North Carolina	129	2,800,749	3,540,383	35,404	70,808	106,211
Total		10,653,199	17,957,545	179,575	359,151	538,726
Min. # of Distinct Vessels	840					
Average Value per Vessel				**214**	**428**	**641**

Source: NMFS Commercial Fisheries (Weighout) Data

North Carolina Commercial Trip Ticket Program	Number of Vessels	Landed Pounds	Landed Value ($)	1% of Value ($)	2% of Value ($)	3% of Value ($)
Summer Flounder	365	2,870,967	5,014,812	50,148	100,296	150,444
Average Value per Vessel				**137**	**275**	**412**

Source: NC Division of Marine Fisheries

1999 Summer Flounder Recreational Harvests by State

A (landed) + B1 (discarded) fish

State	Pounds Caught	Proportional Std. Error	1% of Pounds	2% of Pounds	3% of Pounds
New Hampshire	0	0.0	0	0	0
Massachusetts	509,379	25.5	5,094	10,188	15,281
Rhode Island	829,988	13.7	8,300	16,600	24,900
Connecticut	388,651	19.6	3,887	7,773	11,660
New York	1,714,581	10.8	17,146	34,292	51,437
New Jersey	3,075,973	7.4	30,760	61,519	92,279
Delaware	292,647	12.8	2,926	5,853	8,779
Maryland	445,274	12.1	4,453	8,905	13,358
Virginia	827,261	15.0	8,273	16,545	24,818
North Carolina	282,451	13.3	2,825	5,649	8,474
South Carolina	7,509	53.4	75	150	225
Georgia	5,366	52.1	54	107	161
East Florida	5,688	79.0	57	114	171
Total	8,384,768		83,848	167,695	251,543
No. Trips Targeting	4,230,627				
Average Lbs/Trip			**0.02**	**0.04**	**0.06**

Source: MRFSS Web Query on 12-7-2000

5.6.3.3. Scup Impacts

1999 Scup Commercial Landings by State

Includes: All landings from Maine - Virginia, and partial landings for North Carolina

State	Number of Vessels	Landed Pounds	Landed Value ($)	1% of Value ($)	2% of Value ($)	3% of Value ($)
Massachusetts	105	661,581	773,811	7,738	15,476	23,214
Rhode Island & Conn.	149	1,376,850	1,849,207	18,492	36,984	55,476
New York	127	459,331	718,155	7,182	14,363	21,545
New Jersey	68	796,423	885,346	8,853	17,707	26,560
Maryland	4	502	431	4	9	13
Virginia & North Carolina	12	28,146	1,193	12	24	36
Total		3,322,833	4,228,143	42,281	84,563	126,844
Min. # of Distinct Vessels	432					
Average Value per Vessel				**98**	**196**	**294**

Source: NMFS Commercial Fisheries (Weighout) Data

[Commercial landings of scup are confidential in North Carolina.]

1999 Scup Recreational Harvests by State

A (landed) + B1 (discarded) fish

Source: MRFSS Web Query on 12-7-2000

State	Pounds Caught	Proportional Std. Error	1% of Pounds	2% of Pounds	3% of Pounds
Massachusetts	584,514	26.8	5,845	11,690	17,535
Rhode Island	392,029	22.2	3,920	7,841	11,761
Connecticut	199,316	40.0	1,993	3,986	5,979
New York	575,323	19.5	5,753	11,506	17,260
New Jersey	133,502	39.7	1,335	2,670	4,005
Delaware	284	73.3	3	6	9
Maryland	1,142	64.3	11	23	34
Virginia	0	0.0	0	0	0
Total	1,886,110		18,861	37,722	56,583
No. Trips Targeting	133,703				
Average Lbs/Trip			**0.14**	**0.28**	**0.42**

Source: MRFSS Web Query on 12-7-2000

5.6.3.4. Black Sea Bass Impacts

1999 Black Sea Bass Commercial Landings by State

Includes: All landings from Maine - Virginia, and partial landings for North Carolina

State	Number of Vessels	Landed Pounds	Landed Value ($)	1% of Value ($)	2% of Value ($)	3% of Value ($)
Massachusetts	131	573,541	961,181	9,612	19,224	28,835
Rhode Island & Conn.	202	190541	358482	3,585	7,170	10,754
New York	171	209,464	453,099	4,531	9,062	13,593
New Jersey	164	500,896	780,686	7,807	15,614	23,421
Delaware	5	168,339	275,431	2,754	5,509	8,263
Maryland	27	485,427	760,285	7,603	15,206	22,809
Virginia	118	740,015	1,194,715	11,947	23,894	35,841
North Carolina	100	180,536	456,452	4,565	9,129	13,694
Total		3,048,759	5,240,331	52,403	104,807	157,210
Min. # of Distinct Vessels	799					
Average Value per Vessel				**66**	**131**	**197**

Source: NMFS Commercial Fisheries (Weighout) Data

North Carolina Commercial Trip Ticket Program	Number of Vessels	Landed Pounds	Landed Value ($)	1% of Value ($)	2% of Value ($)	3% of Value ($)
Black Sea Bass	391	587,580	1,004,101	10,041	20,082	30,123
Average Value per Vessel				**26**	**51**	**77**

Source: NC Division of Marine Fisheries

1999 Black Sea Bass Recreational Harvests by State

A (landed) + B1 (discarded) fish

State	Pounds Caught	Proportional Std. Error	1% of Pounds	2% of Pounds	3% of Pounds
Massachusetts	22,324	34.7	223	446	670
Rhode Island	38,669	46.2	387	773	1,160
Connecticut	2,546	78.8	25	51	76
New York	126,134	32.2	1,261	2,523	3,784
New Jersey	522,497	25.7	5,225	10,450	15,675
Delaware	36,744	26.8	367	735	1,102
Maryland	152,710	33.5	1,527	3,054	4,581
Virginia	699,879	31.4	6,999	13,998	20,996
North Carolina	95,067	24.3	951	1,901	2,852
South Carolina	118,813	45.9	1,188	2,376	3,564
Georgia	7,615	56.9	76	152	228
East Florida	126,313	17.5	1,263	2,526	3,789
Total	1,949,311		19,493	38,986	58,479
No. Trips Targeting	124,799				
Average Lbs/Trip			**0.16**	**0.31**	**0.47**

Source: MRFSS Web Query on 12-7-2000

5.6.3.5. Atlantic Mackerel Impacts

1999 Atlantic Mackerel Commercial Landings by State

Includes: All landings from Maine - Virginia, and partial landings for North Carolina

State	Number of Vessels	Landed Pounds	Landed Value ($)	1% of Value ($)	2% of Value ($)	3% of Value ($)
Maine	13	8,491	4,064	41	81	122
New Hampshire	29	21,350	8,611	86	172	258
Massachusetts	161	1,330,381	338,069	3,381	6,761	10,142
Rhode Island & Conn.	123	4,450,936	879,624	8,796	17,592	26,389
New York	88	249,993	65,019	650	1,300	1,951
New Jersey	98	20,036,047	2,207,869	22,079	44,157	66,236
Delaware & Maryland	22	45,205	8,589	86	172	258
Virginia	30	289,538	44,160	442	883	1,325
North Carolina	31	123,195	13,679	137	274	410
Total		26,555,136	3,569,684	35,697	71,394	107,091
Min. # of Distinct Vessels	562					
Average Value per Vessel				**64**	**127**	**191**

Source: NMFS Commercial Fisheries (Weighout) Data

North Carolina Commercial Trip Ticket Program	Number of Vessels	Landed Pounds	Landed Value ($)	1% of Value ($)	2% of Value ($)	3% of Value ($)
Atlantic Mackerel	37	128,417	14,982	150	300	449
Average Value per Vessel				**4**	**8**	**12**

Source: NC Division of Marine Fisheries

1999 Atlantic Mackerel Recreational Harvests by State

A (landed) + B1 (discarded) fish

State	Pounds Caught	Proportional Std. Error	1% of Pounds	2% of Pounds	3% of Pounds
Maine	569,232	18.9	5,692	11,385	17,077
New Hampshire	344,147	17.5	3,441	6,883	10,324
Massachusetts	1,375,726	23.1	13,757	27,515	41,272
Rhode Island	99,061	52.0	991	1,981	2,972
New York	33,752	59.1	338	675	1,013
New Jersey	472,031	37.9	4,720	9,441	14,161
Maryland	37,666	34.3	377	753	1,130
Virginia	11,757	58.5	118	235	353
North Carolina	0	0.0	0	0	0
Total	2,943,372		29,434	58,867	88,301
No. Trips Targeting	218,558				
Average Lbs/Trip			**0.13**	**0.27**	**0.40**

Source: MRFSS Web Query on 12-7-2000

5.6.3.6. Illex Squid Impacts

1999 Illex Commercial Landings by State
Includes: All landings from Maine - Virginia, and partial landings for North Carolina

State	Number of Vessels	Landed Pounds	Landed Value ($)	1% of Value ($)	2% of Value ($)	3% of Value ($)
Maine	4	5,219	2,633	26	53	79
New Hampshire	13	4,518	1,611	16	32	48
Massachusetts	18	1,007,076	308,775	3,088	6,176	9,263
Rhode Island & Conn.	8	8,816,237	2,260,043	22,600	45,201	67,801
New York & New Jersey	22	5,798,599	1,171,217	11,712	23,424	35,137
Virginia	8	482,748	79,251	793	1,585	2,378
North Carolina	15	174,264	26,564	266	531	797
Total		16,288,661	3,850,094	38,501	77,002	115,503
Min. # of Distinct Vessels	88					
Average Value per Vessel				**438**	**875**	**1,313**

Source: NMFS Commercial Fisheries (Weighout) Data

North Carolina Commercial Trip Ticket Program	Number of Vessels	Landed Pounds	Landed Value ($)	1% of Value ($)	2% of Value ($)	3% of Value ($)
Illex squid	14	54,333	26,511	265	530	795
Average Value per Vessel				**19**	**38**	**57**

Source: NC Division of Marine Fisheries

[Illex squid are not typically targeted on marine recreational fishing trips.]

5.6.3.7. Loligo Squid Impacts

1999 Loligo Commercial Landings by State

Includes: All landings from Maine - Virginia, and partial landings for North Carolina

State	Number of Vessels	Landed Pounds	Landed Value ($)	1% of Value ($)	2% of Value ($)	3% of Value ($)
Maine & Massachusetts	146	2,722,443	2,140,657	21,407	42,813	64,220
Rhode Island & Conn.	150	21,353,183	16,890,734	168,907	337,815	506,722
New York	108	9,312,719	7,450,515	74,505	149,010	223,515
New Jersey	101	7,530,143	5,429,605	54,296	108,592	162,888
Maryland	9	78,157	58,358	584	1,167	1,751
Virginia	66	338,151	205,956	2,060	4,119	6,179
North Carolina	73	32,205	14,487	145	290	435
Total		41,367,001	32,190,312	321,903	643,806	965,709
Min. # of Distinct Vessels	526					
Average Value per Vessel				**612**	**1,224**	**1,836**

Source: NMFS Commercial Fisheries (Weighout) Data

North Carolina Commercial Trip Ticket Program	Number of Vessels	Landed Pounds	Landed Value ($)	1% of Value ($)	2% of Value ($)	3% of Value ($)
Loligo squid	174	37,299	20,851	209	417	626
Average Value per Vessel				**1**	**2**	**4**

Source: NC Division of Marine Fisheries

[Loligo squid are not typically targeted on marine recreational fishing trips.]

5.6.3.8. Butterfish Impacts

1999 Butterfish Commercial Landings by State

Includes: All landings from Maine - Virginia, and partial landings for North Carolina

State	Number of Vessels	Landed Pounds	Landed Value ($)	1% of Value ($)	2% of Value ($)	3% of Value ($)
Maine	3	308	134	1	3	4
New Hampshire	3	722	474	5	9	14
Massachusetts	82	162,604	80,590	806	1,612	2,418
Rhode Island & Conn.	141	2,908,710	1,668,008	16,680	33,360	50,040
New York	111	772,437	512,836	5,128	10,257	15,385
New Jersey	108	536,051	239,602	2,396	4,792	7,188
Delaware & Maryland	15	96,555	47,917	479	958	1,438
Virginia	29	139,277	85,595	856	1,712	2,568
North Carolina	96	47,978	25,336	253	507	760
Total		4,664,642	2,660,492	26,605	53,210	79,815
Min. # of Distinct Vessels	525					
Average Value per Vessel				**51**	**101**	**152**

Source: NMFS Commercial Fisheries (Weighout) Data

North Carolina Commercial Trip Ticket Program	Number of Vessels	Landed Pounds	Landed Value ($)	1% of Value ($)	2% of Value ($)	3% of Value ($)
Butterfish	473	89,462	43,197	432	864	1,296
Average Value per Vessel				**1**	**2**	**3**

Source: NC Division of Marine Fisheries

[Butterfish are not typically targeted on marine recreational fishing trips.]

5.6.3.9. Tilefish Impacts

1999 Tilefish Commercial Landings by State
Includes: All landings from Maine - Virginia, and partial landings for North Carolina

State	Number of Vessels	Landed Pounds	Landed Value ($)	1% of Value ($)	2% of Value ($)	3% of Value ($)
Maine	13	6,736	15,472	155	309	464
New Hampshire	3	24	32	0	1	1
Massachusetts	20	3,599	8,581	86	172	257
Rhode Island & Conn.	80	176,385	443,812	4,438	8,876	13,314
New York	41	736,532	1,897,571	18,976	37,951	56,927
New Jersey	21	91,368	215,970	2,160	4,319	6,479
Maryland & Virginia	8	293	405	4	8	12
North Carolina	27	56,644	74,260	743	1,485	2,228
Total		1,071,581	2,656,103	26,561	53,122	79,683
Min. # of Distinct Vessels	202					
Average Value per Vessel				**131**	**263**	**394**

Source: NMFS Commercial Fisheries (Weighout) Data

North Carolina Commercial Trip Ticket Program	Number of Vessels	Landed Pounds	Landed Value ($)	1% of Value ($)	2% of Value ($)	3% of Value ($)
Tilefish	18	5,109	9,553	96	191	287
Average Value per Vessel				**5**	**11**	**16**

Source: NC Division of Marine Fisheries

[Tilefish are not typically targeted on marine recreational fishing trips.]

5.6.4. Cumulative Impacts Across Species

Cumulative impacts of regulation are those that may accumulate over time or across multiple regulations. The greatest potential for cumulative impacts in a set-aside program exists when a vessel is participating in multiple fisheries that have quota set-asides designated for them simultaneously.

Of those fisheries eligible for a set-aside, the greatest overlap in vessel participation occurs in the fisheries for summer flounder, scup and black sea bass, as well as Atlantic mackerel, Illex squid, Loligo squid, and butterfish.

The following tables show that the largest impact would occur among the vessels in the Illex and Loligo squid fisheries. This is due to the relatively small number of vessels that specialize in the squid fisheries. Even so, the cumulative impact on the average vessel is relatively modest, totaling less than $3,500 in a given year.

Potential Cumulative Impacts of Quota Set-Asides in the Commercial Fisheries for Summer Flounder, Scup, and Black Sea Bass*

Species	Average Value per Vessel of a 1% Set-Aside	Average Value per Vessel of a 2% Set-Aside	Average Value per Vessel of a 3% Set-Aside
Summer Flounder	214	428	641
Scup	98	196	294
Black Sea Bass	66	131	197
Total Value	378	755	1,132

*Based on NMFS comprehensive 1999 Commercial landings data from Maine - Virginia and partial landings from North Carolina

Potential Cumulative Impacts of Quota Set-Asides in the Commercial Fisheries for Atlantic mackerel, Illex, Loligo, and Butterfish*

Species	Average Value per Vessel of a 1% Set-Aside	Average Value per Vessel of a 2% Set-Aside	Average Value per Vessel of a 3% Set-Aside
Atlantic Mackerel	64	127	191
Illex squid	438	875	1,313
Loligo squid	612	1,224	1,836
Butterfish	51	101	152
Total Value	1,165	2,327	3,492

*Based on NMFS comprehensive 1999 Commercial landings data from Maine - Virginia and partial landings from North Carolina

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