

5.4 Threatened, Endangered and Other Protected Species

A complete list of threatened, endangered and other protected species inhabiting the scallop management unit was provided in Amendment 10 to the Sea Scallop FMP. An update is provided here to facilitate consideration of the species most likely to interact with the scallop fishery relative to the proposed action.

According to the most recent Biological Opinion provided by NOAA Fisheries Service and dated 12/15/04, the scallop management program as currently implemented may adversely affect loggerhead and leatherback sea turtles. Loggerheads are the only hard-shelled turtle species that has been identified as captured in the scallop dredge fishery despite increased observer coverage throughout the fishery and improved observer training for identifying and documenting turtles species caught in the fishery. Documented interactions with leatherback turtles have occurred in the fishery, but to much lesser degree than loggerheads. The distribution and behavior of other species of sea turtles makes interactions with the fishery unlikely.

The agency also determined that the management program is not likely to adversely affect shortnose sturgeon, the Gulf of Maine distinct population segment (DPS) of Atlantic salmon, hawksbill sea turtles, North Atlantic right whales, humpback whales, fin whales, sei whales, blue whales, or sperm whales all of which are listed as endangered species under the ESA. The Opinion added that the management program is not likely to adversely affect Kemp's ridley or green sea turtles

Similarly, other cetaceans not listed under the ESA, but protected by the Marine Mammal Protection Act, as well the pinniped species inhabiting the action area, do not appear to be vulnerable to scallop gear or negative fishery impacts because of scallop gear configuration and/or the lack of overlap between the fishery and the distribution of these species. Neither has evidence come to light indicating the current scallop management program adversely affects right whale critical habitat.

6 ENVIRONMENTAL CONSEQUENCES—ANALYSIS OF IMPACTS

6.1 Biological Impacts

Requiring VMS on vessels with general category scallop permits is not expected to have any direct change of impacts on biological resources. There are no changes proposed in the scallop possession limits, the number of authorized trips, or the amount of fishing authorized or expected to occur.

There may however be some indirect effects on fishing activity as the fleet absorbs the cost of VMS monitoring. Some vessels may choose to drop the general category permit if they are required to install and operate VMS. As a result, fishing effort may not change but there may be less scallop landings and more discarding, which due to the low discard mortality rate may have some conservation benefit for the scallop resource. On the other hand, vessels that target scallops under a general category permit may increase the number of trips they take to recoup the VMS costs. This could increase mortality on scallops and have a greater impact on the environment. The added cost could also discourage new entrants into the general category fishery; helping to keep catches near present levels and keeping mortality from increasing.

If the amount of catch by the general category fishery changes, the FMP would adjust future limited access allocations and/or general category scallop possession limits to compensate and achieve the target fishing mortality rate.

There are also important secondary benefits from collecting better data with which to manage the fishery and analyze the impacts of the fishery on the environment. This is especially important for data collected from general category vessels, because they tend to fish more frequently in inshore regions and in the Gulf of Maine, which are not part of the annual research surveys. Since effort in the general category fishery tends to occur in areas that differ somewhat from areas targeted by limited access vessels, the fishery is likely to have a greater impact on a different range of finfish species and on habitat. Better knowledge of where this fishing occurs will provide a better assessment of the fishery's effects.

As long as scallop landings are monitored and do not exceed the TAC for each area, removal of the replacement trip charge will have no biological consequences. In addition, Amendment 10 and Framework Adjustment 16/39 take the approach that the total allocation of trips and scallop possession limits approximate a catch that will achieve the mortality objectives.

6.1.1 Scallop Resource

6.1.1.1 VMS Implementation and Power-down - Impacts of Proposed Action and Alternatives

At the present level of fishing effort, there is virtually no impact on the scallop resource, since the proposed management measures do not change the level of authorized catch. No change in scallop possession limits, the number of authorized trips, or other allocations is being proposed at this time. The Council also does not anticipate a change in fishing effort distribution to target larger or smaller scallops as a result of the proposed action.

There may, however, be some indirect effects on the scallop resource in response to higher costs associated with using the permit to land scallops. One on hand, vessels that elect not to install VMS (either by relinquishing their permit under Alternative 1, or by landing less than the possession limit that requires VMS under Alternatives 2, and 3a – 3b) may discard more scallops when targeting other species or take fewer trips targeting scallops (because they cannot land the scallops without having VMS). On the other hand, some vessels that install VMS may choose to target scallops more frequently to compensate for the higher costs.

For vessels that elect not to install VMS, the vessel may continue catching scallops when targeting other species, but would be forced to discard (or land illegally) more scallops if the catch exceeds the limit that requires VMS. Since scallop discard mortality is low under most circumstances (10-30%, see Amendment 10), the additional discarding is likely to have a beneficial conservation effect, although it would reduce income for that vessel. In the long run, this response would allow more scallops to be caught by other vessels and allow the management rules to be more liberal than they would otherwise be.

Similarly, it may not be worthwhile to install VMS for vessels that take a small number of trips targeting scallops. This response could also allow more scallops to be caught by other vessels and allow the management rules to be more liberal than they would otherwise be, because fewer vessels would be operating in the scallop fishery.

Alternatively, vessels that target scallops may elect to target scallops more frequently to compensate for the added compliance costs. At present prices and VMS costs, a vessel might have to take 2 to 3 trips to cover the added cost with scallop revenue, or about 5-10 trips to cover the added costs with profits from scallop trips. These rough estimates will of course vary greatly from vessel to vessel.

The added cost may also discourage new entrants into the scallop fishery. The additional compliance cost is unlikely to dissuade a new entrant that intends to target scallops frequently as a full-time, day-trip activity. Many entrants to the general category scallop fishery, however, begin to target scallops on a few trips when the opportunity exists. If faced with added costs due to VMS requirements, an otherwise occasional participant in the fishery may elect to take no trips targeting scallops because of the higher start up costs.

It is impossible to forecast how such a diverse, open access fishery will respond, except in the most general terms. For Alternatives 1 that would require most or all vessels with general category permits to install VMS, there would probably be more vessels that choose simply to land fewer scallops and discard scallop bycatch more frequently. Proposed alternative, i.e., Alternative 2, Alternative 3a and especially Alternatives 3b and 3c would not affect scallop discarding as much, but may induce some vessels to target scallops more frequently to pay for the added VMS cost. On the other hand, the added VMS cost may discourage new entrants into the general category fleet, thereby keeping a lid on the expansion of the fishery. It would not be surprising, however, to see the vessels with VMS push for an increase in the 400 lb. scallop possession limit in line with the increase in scallop biomass and compliance costs, particularly if limited access is contemplated under the November 2004 control date.

More importantly, however, are the indirect effects on the scallop resource associated with better reporting of scallop landings and with more knowledge about the distribution of scallop fishing effort. Analysis of seasonal and inter-annual fishing effort patterns have been very useful in assessing the impact of fishing on the scallop resource, in particular helping the Council to refine its knowledge of the effectiveness of DAS regulations. The system polls nearly all limited access vessels twice per hour to determine the vessel's position. When sequential positions are compared, the results indicate whether the vessel is probably steaming or fishing.

When combined with the landings for the trip and information from vessel trip reports, the VMS data can provide more detailed information about the resource than we can obtain from the research vessels surveys alone. This is especially true when vessels fish for scallops in unsurveyed areas, which are known to occur in the Gulf of Maine, near Cape Cod, and in shallower areas off the NY and NJ coastline.

More often than limited access scallop vessels, vessels with general category permits tend to fish in more marginal scallop beds near shore, sometimes on an opportunistic or seasonal basis. Because they often fish in unsurveyed areas that support occasional or seasonal fisheries, polling general category position data using VMS equipment will improve information for management of these areas. Future analyses using this new VMS data will help management assess the distribution of effort in the general category fishery and its impact on specific scallop fishing areas.

6.1.1.2 Impacts of the Removal of Broken Trip Disincentive and Rebate of Charges for Replacement Trips

Given the high biomass in controlled access areas and the opportunity for future TAC adjustment, coupled with the probability that the scallop fleet will not take all allocated trips, marginal changes in actual catches from the removal of the two DAS/3,000 lbs. replacement trip charge will have no meaningful impact on the resource. It would also be highly unlikely to cause overfishing, because the FMP already has a built-in 20% buffer between the fishing mortality target and the threshold that defines overfishing. Furthermore, the controlled access trip allocations were made as if there were no broken trips and the entire allocated catch had been taken by the fleet. Therefore, broken trip replacements where the combined catch does not exceed the total allowed for the original trip would not change scallop fishing mortality.

6.1.1.3 No Action

“No action” alternative would be similar to the current system and would include no VMS requirement for general category vessels fishing in the open areas. Because it does not require VMS, no action will not have any VMS power-down alternative associated with it.

The impacts of the no action alternative were discussed above relative to the impacts of the alternatives. If the possession limit cannot be effectively enforced, scallop mortality could increase beyond sustainable levels due to the illegal landings in excess of the 400 lb. possession limit. As a result, the stock biomass for and the future yield from the scallop resource could decline. Therefore, no action could have a negative impact on the scallop resource.

No action would also retain the existing regulations for the broken trip program. The impacts of the no action would not be different from than the impacts specified in Amendment 10. There could be some negligible positive impacts on the scallop resource due to the slight decline in landings because of the automatic charge on replacement trips. But as Table 45 in Section 6.2.2.1 shows, the decline in total scallop landings due to the broken trips was marginal, about 358,940 lb. during the 2004 fishing year.

6.1.2 Finfish Bycatch

6.1.2.1 VMS Implementation and Power-down - Impacts of Proposed Action and Alternatives

The effects on species that are customarily captured as bycatch in the scallop fishery are likely to see changes in impacts that parallel those described above for the scallop resource. This is especially true in this framework action for species that more frequently occur in association with inshore scallop areas where fishing by day-trip vessels with general category permits frequently operate. There are no direct effects anticipated from this action because the amount of authorized fishing and other regulations that effect fishing are not changing. Similarly, the distribution of fishing effort is not expected to change in response to the proposed action.

If fishing effort that targets scallops increase due to vessels trying to recoup the compliance costs, then finfish bycatch would increase by a similar amount. If on the other hand, the added VMS cost discourages additional participation in the general category scallop fishery, it could have a beneficial effect of reducing finfish bycatch compared to the amount that would occur without the

added costs. Less scallop fishing effort due to VMS requirements may however be replaced by higher fishing effort elsewhere.

More importantly, the VMS data provides information about the distribution of fishing by vessels with general category permits. This distributional data is likely to be helpful for assessing bycatch hotspots that overlap the distributions of other managed species. This information may, for example, be used to evaluate the effectiveness of the small mesh exemption program and for identifying seasons when finfish bycatch may be a problem.

6.1.2.2 Impacts of the Removal of Broken Trip Disincentive and Rebate of Charges for Replacement Trips

The removal of broken trip alternative is not expected to change finfish bycatch as long as the scallop catches and total expected fishing effort remains at the levels that were allocated by Amendment 10 and Framework Adjustment 16/39. Replacement trips would be taken in the area where the broken trip occurred and while the area is open for scallop fishing.

No changes in finfish bycatch is expected as long as the scallop catches and total expected fishing effort remains at the levels that were allocated by Amendment 10 and Framework Adjustment 16/39. Replacement trips would be taken in the area where the broken trip occurred and while the area is open for scallop fishing.

6.1.2.3 No Action

There are no significant effects anticipated from no action in regard to VMS implementation. There could be some slightly negative impacts, however, if increased participation in general category scallop fishery leads to an increase in bycatch. These impacts would be marginal given that general category fishery constitutes a small part of total scallop landings and activity. Similarly, retaining the existing regulations for the broken trip program is not expected to have any appreciable impacts on the non-target species.

6.1.3 Habitat Impacts of the Proposed Action and Alternatives

Section 7.1.3 (EFH Assessment) describes and summarizes the expected impacts of this action on essential fish habitat, focusing on the proposed action. Overall habitat impacts of all the measures combined in this action have neutral impacts on habitat, compared to the habitat benefits that will result from implementation of Amendment 10 of the Scallop FMP. These impacts are summarized below for each measure. The impacts of the alternatives are not expected to be different than the impacts of the proposed action.

6.1.3.1 VMS Implementation and Power-down Exemption - Impacts of Proposed Action and Alternatives

There will be no adverse habitat impacts associated with the implementation of the proposed action and the alternatives. The proposed action is not expected to appreciably change the amount or distribution of fishing effort. The VMS implementation proposed by this action is expected to improve effectiveness in monitoring the possession limit, to increase compliance due to the electronic monitoring presence of VMS, and discourage violations. This in turn will reduce the risks of overfishing of the scallop resource due to violations. VMS implementation will also carry several other important secondary benefits. Nonetheless, the information collected by the VMS

program has been very useful in evaluating the effects of the scallop fishery on habitat. This information will be even more useful to evaluate the effects on habitat, particularly in the Gulf of Maine and around Cape Cod, MA, where there are more habitat concerns than in the sandy-bottom areas in Southern New England and Mid-Atlantic waters. This information could be used to improve habitat management and therefore the proposed alternatives could have an indirect benefit for minimizing effects on essential fish habitat. Similarly, there will be no adverse habitat impacts associated with the implementation of the power-down provision. The impacts of the non-preferred VMS alternatives and the no-action are expected to be the same as the impacts of the proposed action.

6.1.3.2 Elimination of Automatic Charge on Broken Trips and Rebate of Charges for Replacement Trips

No changes in impacts habitat is expected from liberalizing the broken trip exemption program. The proposed action is not expected to appreciably change the amount or distribution of fishing effort. The removal of broken trip charge is expected to improve safety at sea by reducing some of the alleged risks associated with the broken trip charge. This is because vessels facing unsafe conditions can return to port without the threat of losing a portion of their authorized scallop landings. Similarly, there will be no adverse habitat impacts associated with the implementation of rebates of charges. Rebate of charges against replacement trips during the 2005 fishing year and prior to implementation of Framework Adjustment 17 will address any actual or implied safety concerns with the broken trip charge as quickly as possible. Replacement trips would be taken in the area where the broken trip occurred and while the area is open for scallop fishing. The impacts of the non-preferred VMS alternatives and the no-action are expected to be the same as the impacts of the proposed action.

6.1.3.3 No Action

Amendment 10 to the Scallop FMP was a major action that was determined to have significant impacts on fishery resources as well as fishing communities. The Secretary of Commerce has approved the Amendment 10 FEIS and accompanying SFA documentation. It was determined that the gear used in this fishery impact the EFH of some species in the region that have EFH vulnerable to bottom tending gears. Therefore, Amendment 10, which was modified by Framework 16 subsequently, identified several specific alternatives to minimize these impacts, to the extent practicable. Both actions implemented specific area closures for habitat, as well as effort reductions, and gear modifications to enhance EFH conservation. No Action is not expected to change habitat impacts addressed in Amendment 10 and Framework 16 (see Section 5.2.3 above for a summary of EFH impacts in Amendment 10). The no action regarding VMS implementation and broken trip program is not expected to impact the amount or distribution of fishing effort. In summary, there will be no significant habitat impacts associated with status quo regulations in regard to both general category fishery and broken trip program.

6.1.4 Impacts of Proposed Action and Alternatives on Threatened, Endangered and Other Protected Species

6.1.4.1 VMS Implementation and Power-down Exemption - Impacts of Proposed Action and Alternatives

General category vessels have historically participated in the sea scallop fishery, and there has been discussion that effort attributed to this sector has increased in recent years and in certain regions, such as off the Virginia coast. To provide perspective, 276 vessels out of 2,554 with general category permits landed more than 40 pounds of sea scallops on at least one trip during the 2003-2004 fishing year. Excluding about 53 boats that already have VMS, this is the group that will be most affected by the action under consideration.

Framework 17 proposes that vessels with general category permits that possess or land more than 40 pounds of scallops per trip be required to install and operate a VMS to enhance monitoring of the general category catch. The action also contains a power down exemption, a suspension of the broken trip exemption and an associated rebate of charges against replacement trips taken during the 2005 fishing year and prior to the implementation of Framework Adjustment 17.

Of the range of alternatives under consideration, including No Action, none are likely to directly affect protected species either a positively or negatively. Changes in fishing patterns could, but are not likely to occur as a result of the new rules. If shifts in effort or other changes do occur as a result of the action, it is probable they will not be separable from other factors that influence fishing behavior, such as weather, market conditions, availability of crew, and vessel maintenance, etc. Indirectly, however, more detailed reporting on catch, and in particular effort distribution and possibly other information, would enable managers to better evaluate the impacts of this fishery on protected and other marine resources.

Currently interactions, primarily involving endangered sea turtles, are monitored by fishery observers and are reported to the Northeast Fisheries Science Center. None of the proposed options will affect that undertaking. The general category sector of the fishery is currently represented by a very limited sample size.

Alternatives that were considered and rejected by the Council are all variations on the VMS requirement. As such, the same conclusions apply as discussed above. Enhanced monitoring of general category vessels have a very remote chance of affecting scallop vessel interactions with any threatened, endangered or other protected species.

6.1.4.2 Elimination of Automatic Charge on Broken Trips and Rebate of Charges for Replacement Trips

No changes in impacts on endangered species and protected resources is expected from liberalizing the broken trip exemption program, as long as the scallop catches and total expected fishing effort remains at the levels that were allocated by Amendment 10 and Framework Adjustment 16/39. The removal of broken trip disincentive and rebates on replacement scallop trips have a very remote chance of affecting scallop vessel interactions with any threatened,

endangered or other protected species. Replacement trips would be taken in the area where the broken trip occurred and while the area is open for scallop fishing.

6.1.4.3 No Action

The no action alternative would continue the status quo regarding both general category fishery and broken trip program, a scenario with no additional discernable impacts to any protected species when compared to any of the alternatives. The status quo was fully reviewed and analyzed in the December 15, 2004 Biological Opinion provided by NOAA Fisheries. The agency concluded that the effects of the continued implementation of the Sea Scallop FMP, and its cumulative effects, may adversely affect but would not jeopardize the continued existence of loggerhead and leatherback sea turtles.

6.2 Economic Impacts

6.2.1 VMS implementation and Power-down exemption

The section provides an analysis of the economic costs and benefits of the alternatives proposed by the Council through Framework Action 17 to the Sea Scallop FMP. The regulatory guidelines require that the economic impacts of the proposed options be compared relative to the impacts likely to occur if “no action” is taken. “No action” here is defined as the continuation of the present regulations which do not require vessels with general category permits to carry a VMS, except those that choose to fish in the Georges Bank controlled access areas. Therefore, the economic impacts of alternatives for VMS implementation are compared to the “no action” (status quo) scenario with no VMS requirement. The economic impacts of the power-down alternatives are also discussed in this Section.

Although economic costs from VMS implementation, including the expenditures on VMS equipment and monthly service charge are known, the economic benefits from VMS implementation could only be analyzed from a qualitative perspective. This is because the benefits will materialize through improved monitoring and enforcement of the possession limit, vessel safety benefits, and better data for scallop fishery management. These benefits cannot be estimated in dollars.

6.2.1.1 Proposed Alternative (Alternative 2)

6.2.1.1.1 Summary of Economic Impacts

VMS implementation is expected to have positive economic impacts compared to “no action,” by improving compliance with the possession limit, and thereby preventing an unexpected increase in overfishing due to illegal landings and a reduction in future scallop landings and revenues. VMS will provide better data for fishery management, particularly for areas that are more frequently targeted by small vessels fishing inshore of the typical scallop fishing areas. The other benefit would be better monitoring of area boundaries that are a part of rotational area management. Such benefits for scallop management will help to maintain the optimum yield and economic benefits from the fishery, although these benefits cannot be quantified.

The proposed action will provide VMS monitoring for the vessels that usually land scallops in excess of incidental amount (40 lb. per trip) allowed for personal use, while exempting a large

number of vessels that are less likely to land scallop or to exceed the possession limit. It will affect about 223 vessels that do not already have a VMS out of a total 276 vessels in this category (Table 36). These 276 landed over 99.9% of the general category scallop landings in 2003. Therefore, the proposed action will provide VMS coverage for the majority of general category scallop fishing activity while limiting the economic impact to those who are actually prosecuting the fishery on a regular basis. If all of these 223 vessels chose to install and operate a VMS, total costs to the industry will range between \$795,000 to \$1,307,000 during the initial year of implementation. The enforcement benefits from this action is, however, expected to outweigh the costs for VMS implementation. These benefits and costs were discussed in detail in Section 6.2.1.1.2 and Section 6.2.1.1.3 below. The economic impacts on vessels were summarized in Section 6.2.1.1.4.

6.2.1.1.2 Economic Benefits of VMS Implementation

VMS implementation is expected to have indirect economic benefits on the scallop industry through improved monitoring and enforcement of the 400 lb. general category possession limit. A vessel monitoring system (VMS) will enable law enforcement personnel to locate general category vessels participating in the scallop fishery, thus improving enforcement's ability to deploy personnel and other resources in monitoring vessel offloads. The improvement in enforcement's effectiveness in monitoring the possession limit and the resulting increase in compliance may help to prevent fishing mortality from increasing beyond the sustainable levels due to illegal landings in excess of the 400 lb. possession limit. Although, the reported category landings by general category vessels constitute a relatively small percentage of total scallop landings (less than 5%), there is an increasing concern both on part of the scallop industry members and enforcement that not all landings are reported or reported accurately by some vessels in the general category.²

If the possession limit cannot be effectively enforced, fishing for scallops with a general category permit could become more attractive to fishermen who usually target other species. If there is no action, that is, there are no new regulations to prevent such an increase in fishing effort, scallop mortality could increase beyond sustainable levels, reducing the stock biomass for the scallop resource. As a result, the future yield and revenues from the scallop resource could decline. This would negatively affect the vessels both with general category and/or limited access scallop permits. Under the "no action" scenario, impacts on the consumer benefits also may be negative due to reduced scallop landings in the future, possibly coupled with higher scallop prices. Similarly, producer benefits would decline due to lower landings and revenues, and higher fishing costs per pound of scallops if overfishing leads to a reduction in the productivity of the scallop resource, measured by LPUE (landings per unit effort). Therefore, VMS implementation is expected to have positive economic impacts compared to "no action," by improving compliance with the possession limit, thereby preventing an unexpected increase in overfishing due to illegal landings and thus a reduction in future scallop landings and revenues. Monitoring fishing activity through VMS also would be less costly, at least for the NMFS, compared to improved monitoring by employing more enforcement personnel at the dockside.

² For example, on September 26, 2004, a Coast Guard Station Menemsha law enforcement team boarded a fishing vessel in New Bedford Harbor and discovered it had over had 3,394 lb. of scallops, that is, over 3,000 lb. the amount of sea scallops the vessel's permit allows for.

However, instead of taking no action, the Council could adopt stringent regulations to prevent overfishing due to the unreported landings in excess of the possession limit. For example, the DAS allocations for the limited access vessels could be reduced, negatively impacting the group of vessels that has already been subject to strict effort controls since 1994. Such an action would redistribute income from the limited access vessels to the vessels with general category permits landing scallops illegally in excess of the 400 lb. possession limit. The Council could also reduce the possession limit for all general category vessels, affecting negatively those vessels that comply with the rules. Therefore, VMS implementation will have positive impacts on the limited access and many general category vessels that comply with the 400 lb. possession limit.

VMS could also have some other important benefits for scallop management. VMS will provide better data for fishery management, particularly for areas that are more frequently targeted by small vessels fishing inshore of the typical scallop fishing areas. Sometimes these areas are not well surveyed, and better information about the general category scallop fishery and its effect on these unsurveyed areas is needed, even though the total landings by this fleet is a relatively small fraction of the entire catch. The other benefit would be better monitoring of area boundaries that are a part of rotational area management. Without the VMS requirement, there would be a fleet of vessels targeting scallops adjacent to closed and controlled access scallop areas, making it more difficult to ensure compliance with rotation area management regulations. Such benefits for scallop management will help to maintain the optimum yield and economic benefits from the fishery, although these benefits cannot be quantified.

VMS could also have potential vessel safety benefits. Since VMS is a system that is constantly monitored, when a vessel signal stops, it provides another method to alert shoreside authorities that the vessel is in trouble. Therefore, transmission of location information through VMS will add another layer of safety in the event of an emergency. Although these benefits cannot be quantified in terms of dollars, they nevertheless may provide economic benefits to the extent that they reduce the chances for loss of property (vessel) and life in emergency situations.

Although the economic benefits discussed in this section are applicable both to the proposed action (Alternative 2) and other alternatives (Alternative 1, Alternatives 3a to 3c) considered by this Framework, the extent of the benefits will be proportional to the number of vessels included in the VMS implementation. While exempting a subset of general category vessels will reduce the overall costs of VMS requirement for the general category fleet, it also will create the same enforcement problems in monitoring the possession limit for the subset of vessels not required to install VMS. The larger the number of vessels that are exempted from VMS requirement, the more difficult it would be to improve the enforcement efficiency in monitoring possession limits. On the other hand, including all 2,554 vessels with general category permits could present a challenge in terms of the current enforcement resources, resulting in an increase the personnel costs of enforcement associated with monitoring VMS activity of a large number of vessels. These trade-offs in terms of economic costs versus enforcement efficiency are discussed relative to each alternative in the following sections.

6.2.1.1.3 Economic Costs of VMS Implementation

VMS implementation will also increase the fishing costs for the general category vessels that do not presently own and operate a VMS. The earnings from scallops significantly exceed these costs for many general category vessels that target scallops, yet for some other vessels that land scallops primarily as a bycatch the VMS requirement could be a financial burden. The initial

investment costs for VMS including the installation charge, activation fee and monthly service are estimated to be \$3,565 for Skymate to \$4,735 for Boatracs as discussed in Section 6.2.1.1.6.

Table 36 shows the costs of VMS implementation for the proposed action and alternatives assuming that all the vessels included in that alternative install a VMS. Total VMS costs will be less than these amounts, however, if some vessels either choose to give up their general category permit or lower their scallop landings instead of investing in VMS. This is because for a vessel that is not required to have a VMS other than for participating in the general category scallop fishery, there will be an incentive to install VMS if scallop revenues exceed the VMS costs.

The proposed action will provide VMS monitoring for the vessels that usually land scallops in excess of incidental amount (40 lb. per trip) allowed for personal use, while exempting a large number of vessels that are less likely to land scallop or to exceed the possession limit. There were 2,554 vessels with general category permits in 2003 fishing year, 2,278 of these vessels either did not have any landings or landed up to 40 lb. of scallops per trip, and 2,121 of them did not have a VMS. These vessels will not be required to operate a VMS and still retain their permit as long as their landings per trip do not exceed 40 lb. of scallops. While the proposed action will restrict the enforcement's ability to monitor the possession limit for these vessels by exempting them from VMS requirement, it will also substantially reduce the costs of VMS implementation.

Proposed action will affect about 223 vessels that do not already have a VMS out of a total 276 vessels in this category (Table 36). These 276 landed over 99.9% of the general category scallop landings in 2003. Therefore, the proposed action will provide VMS coverage for the majority of general category scallop fishing activity while limiting the economic impact to those who are actually prosecuting the fishery on a regular basis. If all of these 223 vessels chose to install and operate a VMS, total costs to the industry will range between \$795,000 to \$1,307,000 during the initial year of implementation. These amounts represent an increase in fishing costs compared to the no action alternative because the vessels with general category permits would not be required to operate a VMS. On the other hand, if all the vessels with general category permits were included in VMS requirement, as in alternative 1, total VMS costs for the fleet would range from \$8.3 million to \$12.1 million depending on the choice of VMS units to be installed. Therefore, the proposed action minimizes the costs for VMS implementation compared to this alternative.

Although expenditures on VMS will comprise the major cost from this framework action, for vessels that cannot afford VMS or choose not to renew their general category permit, or reduce their scallop landings per trip, the costs will be equivalent to the loss in revenue from forgone landings of scallops. Potential losses in revenue for these vessels, for which VMS costs exceed the scallop revenue, are shown in the last row of Table 36 assuming that the vessels with scallop revenue less than the VMS costs will choose not to renew their general category permit. For the proposed action, VMS costs on the average constitute about 11% to 15% of total scallop revenue of the vessels required to operate a VMS (for Skymate and Boatracs, respectively). Many vessels in this group, 79 vessels (if they installed Skymate) and 87 vessels (if they installed Boatracs), are estimated to have an annual scallop revenue lower than the VMS costs. The scallop landings per trip for these vessels were generally less than the 400 lb. possession limit. Therefore, some vessels in this group may reduce their landings of scallops per trip to 40 pounds or less to avoid the VMS requirement, resulting in a potential decline in scallop revenue by about \$105,000. In that case, however, the costs for VMS implementation will also decline below the amounts shown in Table 36 for the proposed alternative. For example, if the vessels that land up to 100 pounds of scallops in this group chose not to invest in VMS, the total cost of VMS implementation would

equal the costs estimated for alternative 3a, which already excludes these vessels from VMS requirement. For some other vessels, however, it could make more economic sense to increase the scallop landings up to the amount allowed for the possession limit (400 lb.) to cover VMS costs. Such action would increase the scallop revenue from the general category fishery.

Theoretically, any vessel catching of scallops below the levels that justify the costs for VMS could also choose not to renew its general category permit. Given that the Council published a control date for the general category fishery, however, many vessels probably will not choose this option. In fact, the publication of the control date and a potential limited entry program into the general category scallop fishery could provide an economic incentive to buy and operate a VMS for many vessels in this category. If, for example, regulations changed at some point to introduce limited access to the general category fishery, the permits may gain a market value for their owners. For more discussion on the possible impacts of the control date, see Section 6.5.3 (Reasonably Foreseeable Actions).

Table 36. VMS alternatives and economic impacts on the general category vessels

Data	Alternatives and maximum scallop landings per trip				
	Alt. 1 All general category permits	(Alt.2) Proposed Action >40 lb.	Alt.3a >100 lb.	Alt.3b >200 lb.	Alt.3c >300 lb.
Number of vessels required to have a VMS	2,554	276	232	175	144
Number of affected vessels (i.e. vessels that don't already have a VMS)	2,344	223	192	156	132
Number of vessels for which VMS costs (for Skymate:\$3,565) exceed scallop revenues	2,200	79	50	22	9
Number of vessels for which VMS costs (for Boatracs:\$4,735) exceed scallop revenues	2,208	87	57	27	13
Scallop landings as a % of total general category landings	100%	99.9%	99.4%	96.8%	94.2%
Total scallop revenue (\$)	7,301,895	7,297,007	7,258,831	6,982,719	6,768,007
Total costs for VMS and monthly service for the general category fleet during 2005 (Skymate:\$3,565)	8,356,360	794,995	684,480	556,140	470,580
As a % of total scallop revenue	114%	11%	9%	8%	7%
Total costs for VMS and monthly service for the general category fleet during 2005 (Boatracs:\$4,735)	12,093,190	1,306,860	1,098,520	828,625	681,840
As a % of total scallop revenue	166%	18%	15%	12%	10%
Annual service costs for Skymate (2006 on)	1,517,506	144,370	124,301	100,994	85,457
Annual service costs for Boatracs (2006 on)	2,953,440	280,980	241,920	196,560	166,320
Total scallop landings by vessels with scallop revenue less than VMS costs*					
Scallop landings in lb.	22,666	21,628	16,604	9,707	4,277
Landings as a % of total general category landings	1.2%	1.1%	0.9%	0.5%	0.2%
Total scallop revenue of vessels with scallop revenue less than VMS costs*	109,415	104,527	76,814	42,757	4,277

*Estimated at the least cost for VMS equipment, installation and monthly service costs (for Skymate).

6.2.1.1.4 Economic Impacts on Vessels

General category vessels that comply with the 400 lb. possession limit and with earnings from scallops significantly exceeding VMS costs will benefit from VMS implementation. Better

enforcement of the possession limit will help to prevent future revenue loss from general category fishery if overfishing of the resource occurs due to the illegal landings of scallops in excess of the 400 lb. trip limit or if stringent measures on general category fleet need to be taken to prevent such overfishing. These vessels will also benefit from better management of the scallop resource made possible by better data on the location of the fishing activity. Finally, all general category vessels are expected to benefit from the additional safety benefits from having a VMS on board. Section 6.2.1.1.7 provides a comparative analysis of economic impacts of the proposed action and the alternatives and Section 7.11 (IRFA) analyses the impacts on vessels from an Regulatory Flexibility Act (RFA) perspective.

6.2.1.1.5 Impacts of Power-down Exemption

This measure is expected to have positive economic impacts on general category vessels that are required to operate a VMS under the proposed action. By allowing vessels to power-down VMS they are while in port and not fishing, the proposed action will reduce compliance costs to vessels. In this way, the vessels would not have to rely on shore power or continuous battery power while in port, which may under some circumstances be unavailable. It could also reduce polling costs for vessels that fish seasonally by allowing them to discontinue VMS operation while they in dock (see Table 37). Since no landings of scallops will be possible while the vessel in dock, the power down alternative is not expected reduce the enforcement benefits from VMS as long as the proposed procedures for power-down exemption could be strictly enforced and vessels that illegally power-down could be detected by enforcement. This alternative would have less administrative costs and would provide more flexibility to vessels compared to the non-preferred power-down via a letter of exemption described in Section 0. The proposed alternative also allows vessels to operate without turning on VMS when they are inside of the VMS demarcation line. The Council proposed this option to provide flexibility to vessels, for example, when they travel from mooring to fuel and ice docks when they do not have a catch aboard. There are enforcement concerns regarding this alternative, however, as discussed in Section 6.3 (Enforcement Benefits and Trade-offs).

6.2.1.1.6 Estimation of Revenues and VMS Costs

In order to analyze the economic impacts of each alternative on general category vessels, the annual scallop revenue per vessel from general category trips for the 2003 fishing year were compared to the costs of installing and operating VMS. This is because for a vessel that is not required to have a VMS in order to participate in the general category fishing, there will be an incentive to install VMS if, at a minimum, its revenues from scallops exceed the VMS costs. This could be a valid assumption for general category vessels that either land incidental amounts of scallops, or for which trip revenue is mostly derived from species other than scallops. In such cases, it can be assumed that trip expenses and crew shares are mostly paid out of revenues from other species, while revenues from scallops as bycatch provide an additional source of income. From this perspective, if scallop revenues exceed the VMS costs, the vessel will have some incentive to make the initial investment for VMS equipment and service estimated in Table 37 for both Boatracs and Skymate units. On the other hand, for some vessels that target scallops and cover their trip expenses and crew income solely from scallop revenue, installing VMS will make economic sense if scallop revenues net of trip costs and crew income exceed the VMS costs. Since the major source of trip income would be from scallops in such cases, scallop revenues should exceed not only the costs for VMS but also the trip expenses and crew shares in order for the vessel owner to derive some profits from these trips. This assumption would be valid mostly

for the general category vessels that targeted scallops and landed more than 300 lb. of scallops per trip in 2003. This is because this group of vessels had a high amount of scallop revenue from targeted trips, which constituted more than 84% of the trip revenue (Table 40).

The level of scallop landings that could generate enough revenue from general category scallop trips, defined as ‘equivalent pounds’ for the purposes of analysis, is estimated in Table 38. If scallop revenues fall short of such threshold, the vessel may either stop taking these trips and avoid VMS costs, or change the composition of its fishing activity to target other species to cover its trip costs while still earning some revenues from scallops as an additional source of income.

Estimation of VMS costs for equipment and service

There are two different VMS units approved by NMFS for VMS operations, Skymate and Boatracs. It is assumed that these units would be operated at the standard polling of once every minute, which is the same as the polling frequency for limited access fleet. The initial investment costs for VMS, including the installation and monthly service, costs from \$3,565 for Skymate to \$4,735 for Boatracs and are estimated as follows:

Table 37. VMS Equipment, Installation and Service Costs

Costs	Standard Boatracs VMS Unit	Skymate plus PC
Initial Investment (one-time costs)		
Equipment	\$3,295.00	\$2,268.00
Installation	\$180.00	\$500.00
Activation fee	\$0.00	\$149.00
Total one-time costs	\$3,475.00	\$2,917.00
Ongoing costs		
Monthly service costs	\$105.00	\$53.95
Annual service costs (2006 on)	\$1,260.00	\$647.40
Total annual equipment and service costs during the first year (2005)	\$4,735.00	\$3,564.40
Average annual fixed costs (annual average for a 4 year period)	\$1,116.00	\$936.00
Average annual costs with service (annual average for a 4-year period)	\$2,376.00	\$1,583.40

Boatracs: As shown in Table 37, the equipment costs for VMS range from \$3,295 for a standard unit to \$3,495 for a unit with a GPS option.³ The VMS installation fee could vary among the dealers, but it usually takes 2 to 3 hours costing \$60 per hour.⁴ The total VMS costs were estimated for a standard Boatracs unit, assuming a 3-hour installation at a total cost of \$180. Monthly service costs are \$70, plus \$35 for double polling, totaling \$105 per month. There is no longer an activation fee for the monthly service. According to these estimates, installing and operating a VMS unit will require an initial investment of \$4,735 per vessel for a standard Boatracs unit. However, after the initial investment for equipment is paid off, the cost of VMS

³ Information is based on communications with Jim Kendall, representing Boatracs.

⁴ Information is based on communications with the representative from Chris Electronics, a Boatracs dealer.

implementation for vessels will comprise monthly service costs adding up to about \$1,260 per year assuming a 12-month operation of VMS. If the equipment and installation costs were paid over a 4-year period by borrowing at an interest rate of 12.75%, average annual costs for Boatrac's will amount to \$2,376 per year, including the monthly service (Table 37). The actual costs could be greater than these amounts if the VMS units need to be repaired due to wear and tear.

Skymate: The cost of Skymate is \$1,188 plus the cost for a PC device, estimated to be about \$1,080.⁵ VMS equipment and PC costs, including installation, will add up to an initial cost of \$2,768 (Table 37). The installation fee is about \$500 per vessel. However, group training will be available for boat owners who would choose to install their own units and reduce their costs. Use of SkyMate VMS services will entail a \$149 activation fee and enrollment in a monthly service plan estimated at \$53.95 per month for double polling, or \$647 per year⁶. This represents the least expensive plan as monthly service costs could go up to \$73.99 a month (\$887.80 per year) if the vessel chooses the Platinum plan recommended by the company. Adding these amounts to the equipment cost results in a cost of approximately \$3,565 per vessel for the first year. After the first year, however, the cost of VMS implementation per vessel will consist of monthly service costs adding up to \$647 per year assuming a 12-month operation of VMS. Again, the actual costs could be greater than these amounts if the VMS units need to be repaired due to wear and tear. If the equipment and installation costs were paid over a 4-year period by borrowing at an interest rate of 12.75%, average annual costs for Skymate would amount to about \$1,583 per year, including the monthly service. For vessels that remain at the dock and do not intend to participate in the fishery during some months, there is a "dry-dock" option at a cost of \$4.99 a month, during which the VMS unit would be turned off, but could be reactivated at any time without the \$149 activation fee.

It must be cautioned that these are rough estimates, and total costs could vary according to the prices and the fee for installation charged by each dealer. These costs could also vary because there could be discounts on the sale units if vessel owners buy more than one unit to be installed for the boats they own. The installation time for VMS units could also vary depending on the vessel. The prices for service and VMS units could also change according to the market conditions in the future.

Estimation of trip costs, revenues and equivalent scallop pounds

The trip costs consist of food expenses, and expenses for fuel, oil and ice, and are estimated from the cost equation provided in Appendix IV of Amendment 10 FSEIS for an average general category vessel. These expenses were estimated in 1996 prices; however, the latest statistics for the average of 11 months ending in November 2004 indicated that fuel costs were 48.5 % higher than in 1996, and food costs were 21% higher. Therefore, trip costs per DAS were adjusted to

⁵ The estimate for PC is based on a price of a laptop that meets the specifications recommended by Skymate. One such unit was a Compaq Presario Notebook with Mobile AMD Athlon™ XP-M Processor 3000 (Model: R3306US). This notebook actually exceeded the minimum requirements and was sold at Bestbuy for \$1,080.

⁶ Monthly costs for Skymate range from \$38.99 for Gold plan to \$73.99 for Platinum plan. Since hourly report adds up to 14,400 characters, 30 minute reporting will require at least 28,800 characters, exceeding the 20,000 characters that Gold plan offers by 8,800. Again, using \$1.70 extra for each additional 1000 characters, 8,800 characters will cost about \$14.96 a month. Adding this amount to the \$38.99 for the Gold plan, results in a \$53.95 monthly service charge for double polling (i.e., twice an hour).

account for these increases, assuming that average fuel costs comprised about 70% of the trip costs, whereas food and other costs accounted for the remaining 30%.⁷ According to the estimates, the trip costs for an average vessel (with 66 GRT, 408 HP, and an average of 2.7 crew) would be \$660 per day in terms of 1996 prices and approximately \$920 per day in 2004 prices. Table 38 also estimates crew shares by assuming a lay system by which crew pays for all trip expenses and receives 60% of the gross revenues from each trip.

In estimating scallop revenues, it is assumed that the revenues during the first year of implementation of F17 will be similar to that for the 2003 fishing year, the latest year for which data is available. This may be a reasonable assumption to make if there are no significant price changes in the near future. In fact, scallop prices in 2003 averaged \$4.55 per general category vessel and were approximately equal to the average price for scallops in March and April 2004, which averaged \$4.48 per pound.

Table 38. Estimation of equivalent scallop pounds and revenues

Data	Total payment for VMS unit and service during the first year		Annualized costs for a 4-year period	
	Boatracs	Skymate	Boatracs	Skymate
Price of scallops per pound	\$4.55	\$4.55	\$4.55	\$4.55
Trip costs per DAS	\$919.5	\$919.5	\$919.5	\$919.5
Number of trips	6.5	4.9	3.3	2.2
Total trip costs	\$5,981.3	\$4,502.8	\$3,002.2	\$2,000.8
Scallop pounds per trip	400	400	400	400
Equivalent scallop landings	2,602	1,958.8	1,306	870.4
Equivalent scallop revenue	\$11,839.1	\$8,912.5	\$5,942.3	\$3,960.3
Crew shares	\$ 1,122.1	\$844.7	\$563.2	\$ 375.4
Vessel revenue net of crew shares and trip costs	\$4,735.6	\$3,565	\$2,376.9	\$1,584.1
Annual VMS equipment and service costs	\$4,735.6	\$3,564.4	\$2,376	\$1,583.4

For the purposes of this analysis “equivalent scallop pounds” are defined as that amount of scallop landings at which a vessel fishing solely for scallops will have sufficient revenue to cover its trip expenses, pay for the crew, and for the VMS units and service charge. In other words, equivalent scallop pounds represent a threshold at which the vessel will derive zero profit after paying for the crew, trip, and VMS expenses. The level of zero profit was selected for calculation purposes and as a threshold, rather than as an economic criterion for vessel operations.

Table 38 estimates equivalent pounds for both Boatracs and Skymate units under two separate assumptions. The first two columns of the table are estimated assuming that the vessel will pay for the cost of equipment, installation and activation charges during the first year of implementation out of its current financial resources. The last two columns annualize these costs

⁷ This assumption is based on the information from cost data for 1996's.
 Framework Adjustment 17
 March 11, 2005

by assuming that the equipment and installation costs will be paid over a 4-year period by borrowing at an interest rate of 12.75% as estimated above in Table 37. These costs are also shown in the last row of Table 38.

It is assumed that a vessel targeting scallops will maximize its trip landings and will land the 400 lb. possession limit on each trip. The total revenues from scallops are estimated by varying the number of trips to calculate the number of trips that will result in “equivalent scallop pounds.” As Table 38 shows, the equivalent pounds are estimated to be about 2,600 lb. of scallops during the first year for Boatracs, and 1,958 lb. of scallops for Skymate. If VMS costs were annualized as discussed above, 1,300 lb. of scallops would be sufficient to cover expenses for Boatracs units, and 870 lb. for Skymate units in addition to paying for trip and crew expenses. The annual revenue corresponding to the estimated pounds is \$11,839 for Boatracs and \$8,912 for Boatracs.

6.2.1.1.7 Impacts of the Proposed Action and Alternatives on Vessels and Small Business Entities

The overall economic costs and benefits of the VMS alternatives proposed by this Framework action on the general category fleet were discussed in Section 6.2.1 above. The impacts of the proposed alternatives will not be uniform, however, for all the vessels with the general category permits. Each successive alternative requires and thus will impact a different subset of vessels with varying rates of participation in the general category scallop fishery. This section describes the characteristics and the fishing activity for the group of vessels included in each alternative, discusses the impacts on each group, and provides the necessary background for the RFA analysis.

The analysis is based on the 2003 fishing year because it corresponds to the most the recent year for which information is available on the annual activity of the general category fleet. The 2003 fishing year also represents a peak year in terms of the number of vessels that participated in the general category scallop fishery, increasing from 194 vessels in 1999 to 337 vessels in 2003. During 2003, the reported landings also increased to 1.9 million lb. of scallops from about 0.2 million lb. in 1999, the highest level except for 2001 when general category vessels landed over 2.1 million lb. of scallops. The results of the following analysis should be interpreted with caution, however, since it provides a rough estimate of the number, landings, characteristics, and composition of the vessels in each group that will be affected by the proposed alternatives. The actual landings by the general category vessels could exceed the amounts shown in the tables, because of illegal landings of scallops in excess of the 400 lb. possession limit not reported in the dealers’ database. The future participation in the general category fishery could also differ from the levels observed in the past, including in the 2003 fishing year. In fact, if past trends continue, the number of general category vessels and total scallop landings by this fleet could increase further in the coming years.

For the purposes of this analysis, the vessels with general category permits are divided into six groups according to their maximum scallop landings per trip corresponding to the criteria for each alternative for VMS requirement. Table 39 shows the number of vessels in each group, including the number of vessels that do not already have a VMS, their scallop landings, revenues, and VMS costs relative to earnings from scallops. It also indicates the alternatives that include the group for VMS implementation.

Table 39. General Category Vessels and VMS Alternatives

Data	Groups of vessels by maximum scallop pounds per trip					
	Group I. Zero lb.	Group II. 1 - 40 lb.	Group III. 41-100 lb.	Group IV. 101-201 lb.	Group V. 201-300 lb.	Group VI. >300 lb.
Number of vessels	2,217	55	44	57	31	144
Number of vessels that don't have a VMS	2,083	38	31	36	24	132
Annual scallop landings per vessel (lb.)	None	29	181	755	1,343	10,652
Annual Scallop revenue per vessel (\$)	None	134	1,046	5,394	7,374	48,414
Scallop landings as % of total general category landings	0%	0.1%	0.5%	2.6%	2.6%	94.2%
Included in Alternative 1 VMS requirement	Yes	Yes	Yes	Yes	Yes	Yes
Included in Alternative 2 VMS requirement	No	No	Yes	Yes	Yes	Yes
Included in Alternative 3a VMS requirement	No	No	No	Yes	Yes	Yes
Included in Alternative 3b VMS requirement	No	No	No	No	Yes	Yes
Included in Alternative 3c VMS requirement	No	No	No	No	No	Yes
% of vessels with annual scallop revenue covering the first year cost for VMS						
Skymate units and service (\$3,565)	0%	0%	<12%	22%	46%	93%
Boatracs units and service (\$4,735)	0%	0%	<12%	17%	42%	90%
Costs of VMS and service as a % of scallop revenue for vessels with annual revenue of at least equal to cost of VMS						
Skymate units and service (\$3,565)	NA	NA	68%	12%	21%	6%
Boatracs units and service (\$4,735)	NA	NA	76%	12%	25%	8%

Beginning with alternative 1, the impacts of each alternative on groups of vessels included in VMS implementation could be summarized as follows:

- Starting with alternative 1, each successive alternative requires fewer groups of vessels to install and operate a VMS, and therefore, will result in a lower cost burden for the vessels in the general category fleet.
- In general, average annual scallop landings and revenue per vessel is larger for groups of vessels with higher maximum landings per trip relative to others. Therefore, the alternatives with a higher threshold for scallop landings per trip will include a larger number of vessels for which VMS costs will be small relative to revenues, and thus will have a smaller negative impact on profits.
- Alternative 1 requires all 2,554 vessels with general category permits, the vessels in Groups I-VI to install and operate a VMS in order to be qualified for the permit. Since 210 of these vessels already have a VMS, about 2,344 vessels are estimated to be affected by alternative 1.⁸ Alternative 1 would have a negative economic impact on a large number of vessels since the majority of these vessels reported either no landings (2,217 vessels in Group I) or had only incidental catches of up to 40 lb. of scallops (55 vessels in Group II) during the 2003 fishing year.

⁸ According to the latest data as of Jan.10, 2005, the number of general category vessels that have a VMS increased to 229 from 210 in 2004 (personal communications by Linda Galvin of Enforcement, NMFS).

- Proposed action, i.e., Alternative 2, excludes the vessels in Groups I and II from VMS implementation, requiring only those vessels with scallop landings of more than 40 lb. per trip (Groups III to Group VI) to install a VMS. As a result, the number of vessels that will be included in VMS implementation will decline to 223 general category vessels that do not have a VMS.
- Alternative 3a would require those general category vessels (Groups IV to VI) with scallop landings of more than 100 lb. per trip to install and operate a VMS. There were 192 general category vessels which fit into this category during the 2003 fishing year that did not already have a VMS
- Alternative 3b would require all general category vessels with scallop landings of more than 200 lb. per trip to install and operate a VMS. It would affect 156 vessels in Groups V and VI that do not already have a VMS. Therefore, compared to Alternative 3a, this alternative would exclude 57 vessels that landed 101 lb. to 200 lb. of scallops per trip with an average annual scallop revenue of \$5,394 during the 2003 fishing year.
- Alternative 3c will have impacts on the least number of general category vessels compared to the other alternatives, resulting in the lowest cost to the general category fleet. It would require only a small subset of general category vessels with scallop landings of more than 300 lb. per trip to install and operate a VMS. According to the dealers' data for the 2003 fishing year, there were about 144 vessels with maximum trip landings of more than 300 lb., and 132 of these vessels did not already have a VMS.

As discussed in Section 6.2.1 above, general category vessels that comply with the 400 lb. possession limit and with earnings from scallops significantly exceeding VMS costs will benefit from VMS implementation. Better enforcement of the possession limit will help to prevent future revenue loss from general category fishery if overfishing of the resource occurs due to the illegal landings of scallops in excess of the 400 lb. trip limit or if stringent measures on general category fleet need to be taken to prevent such overfishing. These vessels will also benefit from better management of the scallop resource made possible by better data on the location of the fishing activity. Finally, all general category vessels are expected to benefit from the additional safety benefits from having a VMS on board. Although the benefits from VMS cannot be estimated quantitatively, they will be higher for vessels that target on and derive a significant proportion of revenue from scallops. The vessels with incidental landings of scallops may have little to benefit from improved enforcement of the possession limit and the positive impacts on the scallop resource.

The analysis of impacts in this section mainly focus on the costs of VMS relative to the scallop or total revenue for the group vessels, keeping in mind these costs should be compared with the potential benefits from VMS implementation. The analysis is based on the information on vessel and crew size, landings, revenues, primary areas fished, primary state of landing, and primary gear used during the trips with scallop landings shown in Table 40 to Table 44 below.

The following provides a description of the characteristics and fishing activity of the general category vessels for each group and a discussion of impacts for each alternative.

- Group I (zero lb. of scallops): This group includes 2,217 vessels with general category permits with no reported landings of scallops during the 2003 fishing year, of which 2,083 vessels have no VMS. Only alternative 1 requires the vessels in Group I to have a

VMS in order to keep their general category permit. Because they derive no income from scallops, many vessels in this group may choose to give up their permit, however, instead of incurring the costs for VMS if alternative 1 is selected. On the other hand, some vessels may choose to install a VMS in order to keep their general category permit as a future investment. In fact, the recent publication of the control date and a potential limited entry program into the general category scallop fishery could provide an economic incentive to buy and operate a VMS for some vessels in this category even if they do not presently participate in the fishery. If, for example, regulations changed at some point to introduce limited access to the general category fishery, the permits may gain a market value for their owners. For vessels that chose to keep their general category permit, alternative 1 will impose a cost burden equivalent to the cost for VMS estimated in Table 37 above. Alternatives 2, 3a, 3b, and 3c will not have any impacts on these vessels because they will be exempted from the VMS requirement with these alternatives.

- Group II (1 lb. to 40 lb. of scallops per trip): This group comprises 55 vessels with incidental catches of scallops up to and including 40 lb., which is the amount allowed for personal use for any vessel. Most of these vessels were otter trawls (41 out of 55 vessels), although a few had scallop and surf clam dredges when they landed scallops (Table 43). These vessels landed only 0.1% of the total general category scallop landings in 2003, with annual landings per vessel averaging 29 lb. of scallops according to the dealer's data. Average annual scallop revenue amounted to only \$134 per vessel, far below the amount sufficient to cover VMS costs for Skymate or Boatracs, even at the annualized cost of \$1,583 for Skymate shown in Table 37 above. Because they earn a minimal income from scallops, many vessels in this category may opt to give up their general category permit if they are included in VMS implementation with alternative 1. On the other hand, as discussed in relation to Group I above, general category permits may have a value as a future investment, providing an incentive for some vessels to install VMS to maintain their permit even if their earnings from scallop landings were marginal. Given that VMS costs constituted an insignificant proportion of their total revenue from all species, about 1% for Skymate and slightly higher for Boatracs, many vessels in Group II may choose this option if they were required to do so to keep their permit. Again, alternatives 2, 3a, 3b, and 3c will not have any impacts on these vessels because they will not be required to have a VMS if these alternatives are implemented.
- Group III (41 lb. to 100 lb. of scallops per trip): Both alternative 1 and alternative 2 require 44 vessels in this group to install and operate a VMS. Alternative 2, however, excludes 2,217 vessels in Group I and 55 vessels in Group II from VMS implementation. Total scallop landings by vessels that landed 41 lb. to 100 lb per trip comprised only 0.5% of the general category scallop landings in 2003. The scallop landings by this group of vessels averaged 88 lb. per trip, and 181 lb. per vessel for the entire year in 2003. The primary gear used by this group while fishing for scallops were otter trawls (24 vessels) and scallop dredges (18 vessels) (Table 43). Consequently, annual scallop revenues averaged \$1,046 per vessel, falling short of the amount needed to cover VMS costs. In fact, only a few vessels (<12%) in this group earned revenues from scallops sufficient to cover VMS costs for equipment and service (Table 39). Therefore, many vessels in this group may have an incentive to leave the general category fishery or reduce their landings of scallops below 41 lb. to avoid paying for VMS. On the other hand, for many other vessels maintaining their general category permit will provide a sufficient incentive for installing VMS for the reasons discussed above, and given that these costs comprise a

small percentage (1.3% for Skymate) of their annual average revenue from all fishing activity (Table 40).

- Group IV (101 lb. to 200 lb. of scallops per trip): There were 57 vessels in this group, which landed 2.6% of general category scallop landings in 2003 (Table 39). Alternatives 1, 2 and 3a will include this group of vessels in VMS implementation, whereas alternatives 3b and 3c will exclude them. Most vessels in this group have a low dependence on scallops as an income source, with scallop revenue constituting 22.6% of the trip revenue during which scallops are landed, and 1.9% of the total fishing revenue in 2003. Most vessels in this group used either otter trawls or scallop dredge as their primary gear when they landed scallops (Table 43). As Table 39 shows, only 17% to 22% of these vessels earned revenues from scallops sufficient to cover VMS costs for Boatracs and Skymate, respectively. Therefore, for the majority of the vessels in this group, scallop earnings alone will not provide an incentive for investment in VMS unless they plan to increase their scallop catch in the coming years. Nevertheless, keeping the general category permit as a future asset will provide incentive for some to install a VMS, given that VMS costs may constitute a small percentage of their total fishing revenue (Table 40).
- Group V (201 lb. to 300 lb. of scallops per trip): This group of 31 vessels landed only 2.6% of general category scallop landings in 2003 and an average of 1,343 lb per vessel during the entire 2003 FY (Table 39). Like the vessels in Group IV, most vessels in this group used either otter trawls or scallop dredge as their primary gear during those trips with landings of scallops (Table 43). Although these vessels exhibited a higher dependence on scallops as a source of revenue (41.8%) from trips that they landed scallops, they earned, on average, only 3.3% of their annual fishing revenue (from all trips) from scallops (Table 40). All alternatives with the exception of alternative 3c require that all vessels in Group V install and operate a VMS. More than 40% of these vessels could pay the VMS costs from their earnings from scallops. For the remaining majority of vessels in this group, at least part of the VMS costs will need to be paid out of their income from other fisheries.
- Group VI (Over 300 lb. scallops per trip): During the 2003 fishing year, there were 144 general category vessels that landed more than 300 lb. of scallops per trip. This group included vessels that targeted scallops and landed over 94% of scallops from general category fishing. The primary fishing gear was scallop dredge for the majority of the vessels (65% of total number of vessels), followed by scallop trawl (18% total number of vessels) when they targeted scallops (Table 43)⁹. In fact, 94 scallop dredges in group VI landed over 61% and 27 scallop trawls landed about 27% of all general category scallop catch during the 2003 fishing year. Scallop revenue as a percentage of the total trip revenue averaged 84% for the trips targeting scallops. These vessels earned a significant proportion, over 29% on average, of total annual income from scallops as well. These vessels fished primarily in the Gulf of Maine (34 vessels), South Channel (23 vessels), Delmarva (36 vessels), and New York Bight areas (19 vessels) as shown in Table 41.¹⁰

⁹ Primary gear is defined as the gear most frequently used during those trips vessels targeted or landed scallops.

¹⁰ Primary area fished is defined as the area where a vessel's major proportion of scallop catch happened. For most vessels the primary area fished were the only area where any scallop catch occurred. The

As Table 42 shows, the primary state of landings by these vessels included the ports in Massachusetts with 50 vessels, in Maine and New Hampshire with 25 vessels, and Mid-Atlantic States with 58 boats.

All proposed alternatives require that the vessels in group VI have a VMS, but alternative 3c would only include this group of vessels in VMS implementation. As Table 39 shows, 90% to 93% of these vessels had scallop revenues covering or exceeding the VMS costs for Boatracs and Skymate, respectively. Because a majority of these vessels targeted scallops during their general category trips, the profitability of these trips will be determined not only by the excess of annual revenue over VMS costs, but also by the ability to pay for the trip costs and crew shares out of the total revenue. The amount of revenue that would cover trip costs, crew shares and VMS costs (defined as equivalent scallop revenue) is estimated to be \$11,839 for Boatracs, and \$8,912 for Skymate as shown in Table 38 above. The majority of these vessels had revenues in excess of these amounts in 2003. The average annual scallop revenue per vessel in this group was \$48,400, and total revenue from targeted trips was \$57,421, far exceeding the VMS and trip costs and crew shares. As compared to other groups of general category vessels (in Groups I to V), the vessels in group VI included smaller boats with an average tonnage of 55 GRT, and with an annual average income of \$164,070 for the 2003 fishing year. As a result, VMS costs comprise a slightly higher percentage, about 2.2% to 2.9%, of fishing annual revenue for these vessels depending on the particular VMS unit to be installed. In short, because they earn a significant income from scallops exceeding the costs for VMS, the vessels landing over 300 lb. per trip (Group VI) are more likely to invest in VMS than the general category vessels in other groups. These vessels are also more likely to benefit from VMS implementation since better enforcement of the possession limit will help to prevent stringent measures in the future if overfishing of the scallop resource occurs due to the illegal landings of scallops in excess of the 400 lb. trip limit.

proportion of landings from each primary area was 100% for 146 out of 331 boats, between 70% to 99% for 56 vessels, between 50% to 69% for 32 vessels, and between 30% to 49% for the rest of the 97 boats.

Table 40. General Category Vessels by Their Maximum Scallop Landings per Trip (2003 Fishing Year)

Data	Maximum scallop pounds per trip					Grand total
	<=40 lb.	41-100	101-200	201-300	>300	
Number of vessels	55	44	57	31	144	331
Number of vessels that don't have a VMS	38	31	36	24	132	261
GRT (average)	71	78	77	76	55	66
Length (average)	60	61	59	60	55	57
Crew (average)	3	3	3	3	3	3
Scallop landings per trip (average)	16	43	88	144	317	276
Number of trips per vessel	2	4	9	9	34	18
Annual scallop landings per vessel (dealer's data)	29	181	755	1,343	10,652	4,919
Annual Scallop revenue per vessel (dealer's data)	134	1,046	5,394	7,374	48,414	22,843
Annual total revenue per vessel from scallop trips	8,115	15,942	23,889	17,637	57,421	34,214
Scallop revenue as a % of total revenue from scallop trips	1.7%	6.6%	22.6%	41.8%	84.3%	66.8%
Annual Scallop revenue as a % of total revenue from all trips	0.0%	0.4%	1.9%	3.3%	29.3%	9.7%
Total annual revenue per vessel	371,267	241,403	283,833	222,685	165,070	235,327
VMS cost as a % of total annual revenue per vessel						
Skymate	1.0%	1.5%	1.3%	1.6%	2.2%	1.5%
Boatrac	1.3%	2.0%	1.7%	2.1%	2.9%	2.0%
Total number of trips	101	185	491	289	4,837	5,903
Total scallop landings (dealer's data)	1,583	7,961	43,054	41,645	1,533,908	1,628,151

Note: Six general category vessels that also had limited access permits at least during part of the fishing year are excluded from the table.

Table 41. Primary Area Fished by Active General Category Vessels and Maximum Scallop Pounds per Trip

Area Fished (Statistical Area)	Groups of vessels by maximum scallop pounds per trip					
	Group II. 1 - 40 lb.	Group III. 41-100 lb.	Group IV. 101-201 lb.	Group V. 201-300 lb.	Group VI. >300 lb.	All Vessels
Gulf of Maine (511-515)	12	12	17	7	34	82
Georges Bank South (525)	NA	NA	NA	NA	NA	6
Georges Bank North (561,562)		NA	NA	NA	NA	7
South Channel (521,522,526)	7	NA	11	4	23	48
Southern New England (537-539)	NA	NA	NA	NA	NA	7
New York Bight (611-616)	NA	5	NA	7	19	37
Delmarva (621-623, 625-627)		NA	NA	NA	36	43
Virginia/NC (631-638)		NA	NA		NA	5
Not known	28	14	18	8	28	96
Grand Total	55	44	57	31	144	331

Note: "NA" indicates that the number of vessels in each category were 3 or less.

Table 42. Number of General Category Vessels by Primary State of Landing

State	Groups of vessels by maximum scallop pounds per trip					
	Group II. 1 - 40 lb.	Group III. 41-100 lb.	Group IV. 101-201 lb.	Group V. 201-300 lb.	Group VI. >300 lb.	All Vessels
New England						
MA	22	19	27	11	50	129
ME and NH	8	5	8	4	25	50
RI	8	8	9	4	6	35
Total	38	32	44	19	84	217
Mid-Atlantic						
NY and NJ	15	7	8	9	30	69
VA and NC	NA	10	5	3	28	46
Total	NA	17	13	12	58	100

Note: "NA" indicates that the number of vessels in each category were 3 or less.

Table 43. Primary Gear used by Active General Category Vessels and Maximum Scallop Pounds per Trip

Primary Gear Group	Groups of vessels by maximum scallop pounds per trip					
	Group II. 1 - 40 lb.	Group III. 41-100 lb.	Group IV. 101-201 lb.	Group V. 201-300 lb.	Group VI. >300 lb.	All Vessels
Number of vessels						
Otter trawl	41	24	26	12	19	122
Scallop dredge	8	18	30	14	94	164
Scallop trawl	NA	NA	NA	NA	27	34
Surf clam dredge	NA	NA	NA	NA	4	11
Grand Total	55	44	57	31	144	331
Scallop Landings as a % of Total general category landings						
Otter trawl	0.1%	0.2%	0.5%	0.3%	2.9%	3.9%
Scallop dredge	0.0%	0.3%	2.2%	2.1%	61.3%	65.8%
Scallop trawl	NA	NA	NA	NA	27.0%	27.2%
Surf clam dredge	NA	NA	NA	NA	3.0%	3.1%
Grand Total	0.1%	0.5%	2.6%	2.6%	94.2%	100.0%

Note: "NA" indicates that the number of vessels in each category were 3 or less.

Table 44. General Category Vessels Classified by Maximum Scallop Pounds per Trip (Cumulative Grouping)

Data	Alternatives and maximum scallop pounds per trip					
	Included in Alt. 1 1 lb. to 40 lb.	(Alt. 2) Proposed Action >40 lb.	Alt.3a >100 lb.	Alt.3b >200 lb.	Alt.3c >300 lb	All vessels
Number of vessels	55	276	232	175	144	331
Number of vessels that don't have a VMS	38	223	192	156	132	261
GRT (average)	71	65	63	58	55	66
Length (average)	60	57	56	55	55	57
Crew (average)	3	3	3	3	3	3
Scallop landings per trip (average)	16	280	238	286	317	276
Number of trips per vessel	2	21	24	29	34	18
Annual scallop landings per vessel (dealer's data)	29	5,893	6,977	9,003	10,652	4,919
Annual average scallop revenue per vessel (dealer's data)	134	27,369	32,361	41,144	48,414	22,843
Annual total revenue per vessel from scallop trips	8,115	39,415	43,867	50,374	57,421	34,214
Scallop revenue as a % of total revenue from scallop trips	1.7%	69.4%	73.8%	81.7%	84.3%	66.7%
Annual scallop revenue as a % of total revenue from all trips	0.04%	13%	16%	23.5%	29.3%	9.7%
Total average annual revenue per vessel	371,267	208,237	201,947	175,276	165,070	235,327
Total number of trips	101	5,802	5,617	5,126	4,837	5,903
Total scallop landings (dealer's data)	1,583	1,626,568	1,618,607	1,575,553	1,533,908	1,628,151
Scallop landings as % of total general category landings	0.1%	99.9%	99.4%	96.8%	94.2%	100.0%

6.2.1.2 No Action

“No action” alternative would be similar to the current system and would include no VMS requirement for general category vessels fishing in the open areas. Because it does not require VMS, no action will not have any VMS power-down alternative associated with it. The impacts of the no action alternative were discussed above relative to the impacts of the alternatives. Enforcement currently has insufficient resources to adequately address enforcing possession limit due to the need to be present when the vessel hits the dock. If the possession limit cannot be effectively enforced, scallop mortality could increase due to the illegal landings in excess of the 400 lb. possession limit. As a result, the future yield and revenues from the scallop resource could decline. This would have negative impacts on the vessels both with general category and/or limited access scallop permits. Producer benefits would decline due to lower landings and revenues, and higher fishing costs per pound of scallops if overfishing leads to a reduction in the productivity of the scallop resource. Under the “no action” scenario, impacts on the consumer benefits would also be negative due to reduced scallop landings in the future, possibly coupled with higher scallop prices.

On the other hand, the no action alternative would minimize the compliance costs for the general category vessels. The costs of VMS implementation with the proposed action will range between \$0.8 million to \$1.3 million for the initial year of implementation, and will decline considerably afterwards consisting only of service charges. The potential negative impacts associated with

illegal landings of scallops due to violations of the 400 lb. general category possession limit is expected to exceed the cost benefits from no action.

6.2.1.3 Non-preferred alternatives

6.2.1.3.1 Economic Impacts of Alternative 1

Alternative 1 requires all vessels with the general category permits to install and operate a VMS. Therefore, this alternative will affect 2,344 vessels that do not already have a VMS and will result in largest costs for the general category fleet (Table 36). The economic benefits of VMS implementation discussed in Section 6.2.1.1.2 will also apply to Alternative 1. In fact, this alternative will have the largest enforcement benefits although it will also result in an increase in personnel costs for enforcement. The trade-offs between benefits and costs for alternative 1 could be summarized as follows:

- Alternative 1 will have negative economic impacts on about 2,200 to 2,208 general category vessels because these vessels either had no reported revenues from scallops during the 2003 fishing year or had revenues from scallops that were less than the costs for VMS equipment, installation and service. If, instead of investing in a VMS, these vessels with incidental or no landings of scallops choose not to renew their permit, the total reduction in scallop revenue is estimated to be \$109,415, with no significant decline in scallop mortality and landings.
- Many vessels with general category permits would choose to install a VMS, even though they did not land any scallops in the past, in order to prevent being disqualified by any potential limited entry program for the general category in the future. If all the vessels included in alternative 1 install a VMS, total VMS costs for the fleet will range from \$8.3 million to \$12.1 million depending on the choice of VMS units to be installed. However, if those vessels with no scallop landings or with incidental catches of scallops chose not to renew their general category permit, total costs of VMS implementation would be equal to the costs for alternative 2, since alternative 2 excludes these vessels from VMS requirement.
- VMS costs should be evaluated relative to the enforcement benefits expected to occur with VMS implementation. As discussed in Section 6.2.1.1.2, VMS will act as a deterrent to illegal scallop landings due to better monitoring of fishing activity. From that perspective, Alternative 1 could have the largest enforcement benefits compared to other alternatives because it will include all general category vessels, which can potentially land scallops. On the other hand, this alternative could present a challenge in terms of the current enforcement resources. It will increase the personnel costs of enforcement associated with monitoring VMS activity of a large number of vessels with general category permits. For this reason, additional VMS funding may be required if this alternative is selected for implementation.
- If all the vessels with no reported landings of scallops or that landed only incidental amounts (up to 40 lb. of scallops) included in Alternative 1 choose not to buy a VMS, then the total VMS costs will be approximated by the amount shown for alternative 2 (Proposed Action), which already excludes these vessels from VMS implementation. In fact, the total VMS costs for each alternative, assuming that a part of the general category fleet will not renew their permit, could be estimated from the total VMS costs for each

successive alternative that requires a smaller subset of vessels to have a VMS. Therefore, the VMS costs for any alternative could be less than estimated in Table 32 if many vessels follow such a strategy.

- On the other hand, some general category vessels that were catching scallops below the 400 lb. possession limit may increase their scallop landings per trip in order to cover VMS costs instead of leaving the general category fishery. In such a case, Alternative 1 could increase scallop landings from general category fishery, thus could result in overfishing and a reduction in future scallop landings and revenues.

6.2.1.3.2 Economic Impacts of Alternative 3

Alternatives 3a to 3c would affect a smaller number of vessels, ranging from 192 vessels for alternative 3a to 132 vessels for alternative 3c because they employ a higher threshold for scallop pounds per trip as criteria for VMS requirement (Table 36). Total scallop landings comprised 99.4% of total general category landings in the 2003 fishing year for the group of vessels included in alternative 3a and 94.2% for the group of vessels included in alternative 3c. Therefore, alternatives 3a to 3c, will require VMS implementation for the group of vessels that are most active in the scallop general category fishery and benefit from scallop fishing.

In fact, most of these vessels included in alternatives 3a to 3c had scallop revenues in excess of the amounts required to pay for VMS. Consequently, total cost burden for these alternatives will be relatively small and will comprise about 9% to 15% of the total general category scallop revenues for alternative 3a, and 7% to 10% for alternative 3c depending on the VMS unit installed. These alternatives also will minimize the total loss in scallop revenue due to some vessels with small landings of scallops choosing not to install a VMS. In addition, some general category vessels in any group defined by their scallop landings per trip in Table 32 could choose to land less scallops per trip than the threshold amount for VMS requirement in order to avoid VMS costs.

On the other hand, alternatives 3a to 3c present greater trade-offs in terms of enforcement efficiency. They will have smaller enforcement benefits compared to alternatives 1 and 2 by creating another subset of vessels for enforcement to monitor through dockside inspection. In fact, requiring vessels with scallop landings in excess of 100 lb., 200lb. or 300 lb. for alternatives 3a, 3b, and 3c, respectively, will create another trip limit for enforcement to monitor.¹¹ Therefore, each successive alternative starting with alternative 3a, will have the least cost burden for the general category fleet, but at the same time, will result in less enforcement benefits by requiring VMS on a smaller number of general category vessels.

¹¹ The 40 lb. limit proposed by Alternative 2 (proposed action) is consistent, however, with the provisions of the general category permit, since a vessel needs no permit to land less than 40 lbs. of scallop meats.

6.2.1.3.3 Power-down via Letter of Exemption

Similar to the proposed power-down alternative, this measure is expected to have positive economic impacts on general category vessels that are required to operate a VMS. By allowing vessels to power-down VMS they are while in port and not fishing, the proposed action will reduce compliance costs to vessels. In this way, the vessels would not have to rely on shore power or continuous battery power while in port, which may under some circumstances be unavailable. It could also reduce polling costs for vessels that fish seasonally by allowing them to discontinue VMS operation while they in dock (see Table 37). Since no landings of scallops will be possible while the vessel in dock, the power down alternative is not expected reduce the enforcement benefits from VMS as long as the proposed procedures for power-down exemption could be strictly enforced and vessels that illegally power-down could be detected by enforcement. This alternative would have more administrative costs and would provide less flexibility to vessels compared to the proposed alternative described in Section 4.1.1.2. On the other hand, as compared to the proposed power-down alternative, this option would reduce the incentive for some vessels to illegally turn off the VMS in order to circumvent inspection due to the stricter requirements for power-down. These include the requirement for the vessels to be out of water for 72 consecutive hours, and having a letter of exemption on board specifying the location of the vessel while exempt, the time period for the exemption. While stricter requirements for power-down will improve the economic and enforcement benefits associated with VMS implementation, this alternative would have more costs associated for vessels because of less flexibility for powering-down VMS.

6.2.2 Broken Trip Exemption Program

6.2.2.1 Proposed alternative

6.2.2.1.1 Removal of Broken Trip Disincentive

Suspending the replacement trip charge will have positive economic impacts by reducing the losses from broken trips for the limited access scallop vessels that fish in controlled access areas. With the status quo broken trip program, vessels would be allowed to take replacement trips for each controlled access area trip they terminated, but at a charge of 2 days-at-sea plus one day-at-sea for each 10 percent of the scallop possession limit onboard the vessel (i.e. landed). The day-at-sea allocation for the replacement trip will be the remaining days-at-sea for that trip after this charge. Furthermore, the possession limit will be prorated at a 1,500 per day-at-sea equivalent. For example, a vessel charged two days for a broken trip could continue the trip later in the fishing year, but would be able to land 15,000 lbs of scallops, instead of 18,000 lb. of scallops allowed for a regular controlled access area trip. As a result, a vessel could lose 3,000 lb. by having a broken trip with no landings, amounting to a loss of about \$13,650 if evaluated at an average ex-vessel price of \$4.55 per pound of scallops.

The proposed action would prevent such revenue loss because it will allow vessels to land the difference between the possession limit and the amount of scallops they landed during the broken trip. In other words, total pounds landed from the broken and the replacement trip will add up to the possession limit (18,000 lb. for 2004 fishing year) for that area.

During 2004 fishing year, there were 145 applications for broken trips, most of which occurred during the winter months. As Table 45 shows, due to the broken trip charge, the total pounds of

scallops landed from the broken and the replacement trip would be 15,525 lb. per trip on the average, which is 2,475 lb. less than the 18,000 lb. possession limit. With the proposed action the automatic charge would not be applied, resulting in an additional 358,940 lb. of scallop landings and an additional \$1.6 million in revenue for the scallop fishery.

In addition, the suspension of the broken trip charge could provide more incentive for vessels to take broken trips, leading to more broken trip applications and replacement trips in the future and resulting in higher scallop landings and revenues. It is not possible to predict, however, how much the use of the broken trip provision will occur without the automatic DAS change on the replacement trip.

Table 45. Broken trips, scallop landings and revenues (2004 fishing year)

Data	Sept to Nov. (2004)	May to Aug. (2004)	Dec.2004 to Feb.2005	Grand Total
Number of broken trips	30	52	63	145
Scallop landings per broken trip (average per trip)	8,965	8,829	6,740	7,950
Scallop pounds allowed to land from replacement trips (average per trip)	6,750	6,731	8,664	7,575
Total scallop pounds from broken and replacement trips (per trip)	15,715	15,560	15,404	15,525
Loss of scallop pounds per trip due to broken trip charge	2,285	2,440	2,596	2,475
Loss of scallop revenue per trip due to broken trip charge	10,395	11,102	11,810	11,263
Total loss in scallop landings from all broken trips (lb)	68,541	126,875	163,524	358,940
Total loss in scallop revenue from all broken trips (\$)	311,862	577,281	744,034	1,633,177

The vessels will need to submit a trip termination notice via VMS in order to benefit from the broken trip program, and an application for DAS/trip adjustment with actual DAS use and landings. The costs of filling these applications are expected to be minimal, and be outweighed by the benefits from the broken trip adjustment.

6.2.2.1.2 Impacts of Rebate of Charges Against Replacement Trips During the 2005 Fishing Year

This measure will provide vessel operators more flexibility for all trips in the 2005 fishing year, even if they occur prior to the implementation of Framework Adjustment 17. The economic impacts of this action is expected to be positive because vessel owners will be able to land the full amount of the possession limit through replacement trips and the rebates starting with the 2005 fishing year.

6.2.2.2 No Action

6.2.2.2.1 Broken trip Program

No action will retain the existing regulations for the broken trip program. The impacts of the no action is evaluated above in relation to the proposed removal of the broken trip program. Vessels returning from a controlled access area trip with less than the scallop possession limit, due to an emergency, poor weather, or any other reason deemed appropriate by the captain will have the automatic DAS charge reduced, based on the amount of scallops landed. Therefore, no action will involve economic costs associated with the broken trip. As discussed in Section 4.2.1.1 above, the loss of revenue associated with a broken trip could exceed \$10,000 for some trips. For example, during the 2004 fishing year, the existing broken trip program resulted in a \$1.6 million in revenue loss for the scallop fleet.

6.2.2.2.2 Broken Trip Rebate: Status Quo

Vessels with a broken trip taken before the framework adjustment becomes effective would fish under existing rules, i.e. the broken trip program disincentive would apply. Because replacement trips for these broken trips would have an allocation that is based on the existing schedule where landings on replacement trips are imposed a 'charge' of up to 2 DAS and 3,000 lbs, this alternative would result in a revenue loss for vessels that have a broken trip before the implementation of Framework 17.

6.2.3 Uncertainties and Cautions

The results of these analyses presented above and in the following sections should be interpreted with caution. The number of affected vessels, scallop landings and revenues were estimated from the 2003 fishing year data. These numbers could change in the future depending on several factors, including in changes in scallop resource biomass and yield, scallop prices, import prices for scallops, fishing expenses, VMS costs, changes in profitability of the scallop trips relative to trips targeted on other species, and changes in management measures affecting scallop fishery and other fisheries that limited access and general category vessels participate.

6.3 Enforcement Benefits and Trade-offs

The enforcement benefits of the proposed alternatives for VMS implementation were discussed above in Section 6.2.1.1.2 (Benefits of VMS implementation), and elsewhere in the document (Section 3.1 and Section 4.1.1). As a summary, VMS will improve enforcement's ability to deploy personnel and other resources in monitoring vessel offloads, and thus will increase effectiveness in monitoring the possession limit. Another benefit would be better monitoring of area boundaries that are a part of rotational area management.

The enforcement benefits are expected to be proportional, however, to the number of vessels included in the VMS implementation. While exempting a subset of general category vessels would reduce the overall costs of VMS requirement for the general category fleet, it also would create the same enforcement problems in monitoring the possession limit for the subset of vessels not required to install VMS. The larger the number of vessels that are exempted from VMS requirement, the more difficult it would be to improve the enforcement efficiency in monitoring possession limits. For this reason, the best option from an enforcement perspective would be to require all vessels with general category permits, as in non-preferred alternative 1, to operate a

VMS. There were about 2,554 vessels with general category permits in 2003, which would be included in VMS implementation if Alternative 1 selected. From the cost side, however, this alternative could present a challenge in terms of the current enforcement resources. It would increase the personnel costs of enforcement associated with monitoring VMS activity of a large number of vessels with general category permits. For this reason, additional VMS funding would be required if this alternative was selected for implementation. Alternative 1 would also result in largest costs for the general category fleet as examined in Section 6.2.1.3.1 above, ranging from \$8.3 million (Skymate) to \$12.1 million (Boatracs) depending on the choice of VMS units to be installed.

Enforcement benefits for proposed action (Alternative 2) are expected to be lower than Alternative 1. On the other hand, proposed action will affect about 223 vessels that do not already have a VMS and will have significantly lower compliance costs, ranging between \$0.8 to \$1.3 million during the initial year of implementation. Enforcement benefits are expected to be greater for the proposed action which includes all general category vessels that land more than an incidental amount of scallops (over 40 lb. per trip) compared to Alternatives 3a, 3b and 3b, which require consecutively a smaller subset of general category vessels to have VMS, and therefore resulting in a larger subset of vessels that will be monitored through current method of dockside patrol effort.

Although the proposed alternative for power-down would allow the VMS program to track vessel activity while at sea and reduce compliance costs to general category vessels while they are in port, it will also reduce the enforcement effectiveness in monitoring the possession limit. From an enforcement perspective, a twenty-four/seven VMS coverage on general category scallop vessels would be the best method to ensure compliance within this segment of the fishery. The volume of small, itinerant vessels that participate in this fishery challenges the resources of Law Enforcement to stay current with the activities associated with this fleet. Recent enforcement actions aboard several general category vessels have uncovered strong evidence that suggest multiple prior landings by subject vessels exceeding the 400 pound trip limit with little to no concern of apprehension. According to the proposed action, the vessels are required to send hourly positional signals except when they power down VMS may after offloading and after vessel is secured to a fixed dock or mooring. This action will improve enforcement's effectiveness benefits because the application of hourly positional signals would:

- Profile vessels on grounds longer than expected to harvest 400 pounds and target subject vessels.
- Ensure vessels stay clear of closed areas.
- Locate port of landing prior to vessel's arrival.
- Allow fisheries management to assess effort.
- Locate vessels quickly to assess compliance.

On the other hand, power-down would reduce the enforcement's effectiveness because it would:

- Allow vessels to fish undetected, especially if intent on exceeding trip limit by simply turning off the VMS.
- Allow target vessels to move from port to port without notification in order to circumvent inspection.

- Allow a suspect vessel inbound from grounds with an overload to power down prematurely and later cite a litany of plausible excuses.
- Allow vessels that buoy off excess scallops would power down after landing only to retrieve the scallops later undetected by VMS.

While recognizing these trade-offs in terms of reduced enforcement efficiency, the Council proposed power-down exemption to balance the enforcement benefits with the costs of operating VMS while a vessel in port. As explained in Section 4.1.1.2, without this exemption vessels would have to rely on shore power or continuous battery power while in port, which may under some circumstances be unavailable. Because no landings of scallops will be possible while the vessel stays in dock after downloading, this exemption is not expected to reduce the enforcement benefits associated with the VMS implementation except if the vessels illegally turn off the VMS while they are fishing and remain undetected by enforcement as explained above.

There are also enforcement's concerns with the re-powering part of the proposed action which allows vessel to operate without turning on VMS when they are inside of the VMS demarcation line. The Council proposed this option to provide flexibility to vessels, for example, when they travel from mooring to fuel and ice docks when they do not have a catch aboard. However, enforcement is concerned that if vessels can move around inside the VMS line without turning on VMS - which could easily include transiting from port to port - the purpose of VMS for these vessels would be quickly defeated. Such allowance will also increase enforcement complexity because it results in more types of exemptions that the enforcement has to deal with while using its resources for monitoring the possession limit. Therefore, from an enforcement perspective, if the vessels are given the option to power down after a vessel is secured to a fixed dock or mooring, they should be required to power up VMS when they leave the mooring for any reason, even if they are inside the VMS line.

The proposed action regarding the removal of broken trip disincentive is not expected to have significant impacts on enforcement costs or benefits. Broken trip rebates will increase administrative costs slightly since NMFS will have to let the fishermen know that they are entitled to another replacement trip and keep track of these trips. However, this increase in costs is not expected to be significant because NMFS already tracks the broken trips and have procedures in place for doing so.

6.4 Social Impacts

The mandate to consider the social impacts from proposed federal fishery regulations stems from the National Environmental Policy Act (NEPA) and the Sustainable Fisheries Act (SFA). NEPA requires that any regulation that will have impacts on the environment must also consider the economic and social impacts of such actions. National Standard 8 of the SFA requires that "Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities" (16 U.S.C. § 1851(2)(8)). The act further defines a fishing community as one that is "substantially dependent or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes

fishing vessel owners, operators, and crew and United States fish processors that are based in such community” (16 U.S.C. § 1802 (16)).

6.4.1 Impacts of VMS implementation and Power Down Exemption - Impacts of Proposed Action and Alternatives

The general category fleet is a heterogeneous group of fishermen composed of those who target scallops on a smaller scale than limited access vessels, and those that primarily catch scallops as bycatch (see Affected Human Environment section). Many of these vessels are relatively small ones that engage in a variety of different fisheries throughout the year, in a manner of annual rounds once common to many small-scale operations. This framework is essentially a question of whether or not, and for whom, to require the installation of VMS units. Clearly, the higher the landings threshold at which the VMS requirement is applied, the fewer the number of fishermen who will be impacted in the ways detailed below. A vessel that would be required to install VMS would lose its general category permit without the use of VMS. If vessels don't upgrade to VMS, it may be because the permit is inactive or the landings so low as to not justify the cost of a VMS unit. The economic impacts on such vessels who do not install VMS may seem minimal on both these vessels and the fleet as a whole (see Economic Impact section). However, in social terms, the effect is rather more subtle for it further limits flexibility, which in the long run can undermine the traditional round. While an open access fishery, such as the general category fishery, is often controversial in terms of the potential loss of economic rent, the indirect curtailment of open access through the requirement of costly devices such as VMS would achieve access restriction in potentially inequitable ways, i.e. restricting access to those able to afford the additional requirements.

While VMS is suggested as a method for enhancing the ability of enforcement to monitor violations, the analysis of social impacts should direct attention to the possibility of creating new institutional incentives to fish or violate trip limits. For example, for those vessels that do install VMS, the initial impact will be the financial cost of installing and maintaining the unit. (This cost will be presumably borne by vessel owners, although a possible social impact is that such costs could later affect changes in the crew share ratio.) Additionally, those vessels incurring additional costs from VMS might actually increase their catch of scallops in order to pay for the VMS, thus increasing scallop resource use by general category vessels. In combination with the upcoming control date proposed for the general category fishery, such inactive permits may be even more likely retained and utilized. Furthermore, while requiring only a subset of the vessels to install VMS would lessen the immediate economic impact on the fleet, such internal differences might actually create institutional incentives to violate trip limits among those that are not subject to the additional monitoring.

In terms of positive social impacts, the addition of a VMS unit can enhance safety at sea through its ability to both locate vessels in distress and send distress messages to other vessels that may be nearby. Finally, although VMS may only aid enforcement in combination with other forms of monitoring, it will help with the perception problem that there may be widespread cheating, and help mitigate feelings of inequality among limited access fishermen that they shoulder an unfair burden from enforcement.

Power down alternative: This alternative takes into account the nature of many of the vessels in the general category fleet, which may either be small vessels or dock in small ports where power

availability or cost may be an issue of concern. Such an allowance will enable more vessels to participate in the VMS system, and thus in the general category fishery.

6.4.2 Removal of Broken Trip Disincentive and Rebates for Replacement Trips for 2005 fishing year:

The proposed alternative will have positive social impacts in terms of both safety at sea and confidence in the fishery, if it makes vessels in dangerous conditions more likely to come back to shore as discussed in Section 4.2 (Proposed Action). The existing broken trip program allows vessels to take replacement trips for each controlled access area trip they terminated, but at a charge of 2 days-at-sea plus one day-at-sea for each 10 percent of the scallop possession limit onboard the vessel (i.e. landed). The proposed action would prevent such economic loss because it will allow vessels to land the difference between the possession limit and the amount of scallops they landed during the broken trip. As a result, the decision to terminate the trip will be based on the ability for the vessel to make an economical makeup trip without consideration of a loss in revenue. Thus, the proposed action will reduce the potential safety misjudgments by fishermen in an attempt to avoid revenue loss from broken trips, and will promote the safety of human life at sea. Similarly, rebates for the charges for the replacement trips taken during the 2005 fishing year may reduce some of the alleged risks associated with the broken trip charge. The vessels facing unsafe conditions can return to port without the threat of losing a portion of their authorized scallop landings. Therefore, taking this action will improve safety associated with the broken trip program as quickly as possible.

6.4.3 No Action

The no action alternative would continue the status quo regulations regarding general category fishery. This action would have positive social impacts because it provides the general category vessels more flexibility to participate in the scallop fishery without imposing extra compliance costs associated with VMS implementation. On the other hand, the perception that there may be widespread violations of the general category possession limit could have negative social impacts by increasing the feelings of inequality among both general category and limited access fishermen who obey with the regulations governing scallop fishery.

No action would also retain the status quo broken trip program and would entail no rebates on charges for replacement trips. This action would have negative social impacts by increasing the alleged safety risks associated with the automatic charge on replacement trips. The existing broken trip program allows vessels to take replacement trips for each controlled access area trip they terminated, but at a charge of 2 days-at-sea plus one day-at-sea for each 10 percent of the scallop possession limit onboard the vessel (i.e. landed). Such automatic charge would reduce vessel revenue and crew income from the broken trips. As a result, it could result in potential safety misjudgments by fishermen in an attempt to avoid revenue loss from broken trips.

6.4.4 Fishery Dependent Communities (National Standard 8)

National Standard 8 requires the consideration of impacts on fishery dependent communities, where a fishing community is “a community which is substantially dependent on or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community.” Current guidance on National Standard 8 focuses on communities as

towns or cities, a geographic unit that might fit the Census Bureau's definition of a "place." Additionally, a number of factors to consider in making determinations of dependence are supplied in current guidance, such as landings information, numbers of participants, and the sociocultural importance of the fishery. Yet, methodological guidelines are in the process of refinement, and the question of how to interpret a spatial construct like the community, and what analytical weight to give it, is also a matter of scholarly debate. For many social science disciplines, it is axiomatic that space is social: socially used, organized, and produced, where places are not isolated but are connected in networks of relations through collective activity over time. The weigh-out data and the permit files list ports, which are not necessarily or always the same places where people live, where specific styles of and knowledge about fishing are practiced, and where the impacts of management are most strongly felt. Moreover, the ownership structure of the scallop fleet—to what extent boats are owner-operated or boats are part of larger, corporately-owned fleets—is difficult to judge from the permit files. Thus to assess what and where the "communities" are would require a broad-based ethnographic research program aimed at these questions.

Unfortunately, resources have not been directed towards the systematic and long-term collection of the kinds of baseline data needed to make such determinations in an empirically grounded way. However, the Northeast Region has begun to make some headway in collecting the kinds of information and performing the kinds of analyses to support National Standard 8 determinations, including current staff efforts to profile regional communities, as well as recent past efforts such as the Marine Fisheries Initiative (MARFIN) project on fishing communities and fishing dependency in New England (Hall-Arber, *et. al* 2001) and an updated port-profiles report for the Mid-Atlantic (McCay and Cieri, 2000). While some of these efforts include discussions of communities at larger levels than a "place," they are still useful in providing context and background for a discussion of communities as defined for National Standard 8. Together these strive to give a picture of how fishing communities identified in the previous section, with their varying fishing styles and practices, may be impacted by the proposed regulations.

6.4.5 Analysis of Affected Ports

The analysis of affected ports was based on location of landing ports as recorded in logbooks records, and location of homeports as recorded in vessel permit records. All attempts were made to correct the logbooks for inaccurate entries, namely the recording of landings in shellstock incorrectly entered as scallop meat. Additionally, homeport entries were corrected to the extent possible for misspellings and other problems. The group of the 20 or so ports with the highest number of affected vessels is essentially the same regardless of option (Table 60). It includes Cape Cod ports (Barnstable, Chatham, Provincetown, and Sandwich); New Jersey ports (Barnegat Light, Cape May, Long Beach, and Point Pleasant); mid-Atlantic ports (Shinnecock NY, Ocean City MD, Chincoteague VA, Hampton VA and Wanchese NC); Northern New England ports (Gloucester, Newburyport and Rockport MA, and Stonington ME); and southern New England ports (Plymouth, New Bedford and Fairhaven MA and Point Judith RI). Not all of these ports have a significant portion of their total landed value stemming from general category scallop landings (see Affected Human Environment section and Table 50). Of these, those that have over 5% from general category scallop landings in 2003 (either directly as a port of landing or indirectly as homeport) include Stonington, Barnstable, Provincetown, Sandwich, Newburyport, Barnegat Light, and Chincoteague.

Most of these ports are marked by small-boat fisheries which may be more vulnerable to changing regulations. Census data (Table 61) give some indication for these ports of additional sources of community stress or vulnerability. Stonington and Chincoteague have relatively higher rates of poverty and lower levels of educational attainment, suggesting economic and occupational vulnerability is higher overall in these towns. Provincetown experiences high unemployment and poverty rates. Virtually all these towns have a high percentage of housing devoted to seasonal and tourists uses, which may indicate they are facing gentrification pressures, threats to working waterfronts, and other related issues such as housing costs. Both Stonington, Barnegat Light, and Chincoteague show a high level of employment involvement in the occupation category “Farming, fishing, and forestry,” which will including more than fishing is generally considered to drastically undercount involvement in fishing. Finally, by looking at the ratio of landings to aggregate community income (which does not give an accurate count of community income dependence on fishing, since it is unknown whether landings income stays in a community, and because it does not account for additional economic linkages generated by fishing activity), one can get a general sense of the importance of fishing in a community, in this case Stonington, Barnegat Light, and Sandwich.

Some other analytical standards have characterized a number of these general category scallop ports as generally fishing-dependent. While such characterizations may or may not meet the legal standards established for National Standard 8, they do give a sense of the effect scallop regulations may have on these communities. The MARFIN report tried to assess levels of regional dependence in New England using a variety of dependency indices. Of the ports listed above, Cape Cod region ports Sandwich and Provincetown ranked as highly dependent on fishing, either in terms of actual employment or because of a lack of alternative occupations for fishermen (Hall-Arber *et. al* 2001: 33). Additionally, Sandwich was also noted as having positive factor rankings in terms of infrastructure capacities (*ibid*: 40-43), while Provincetown was noted as being vulnerable to gentrification pressures (*ibid*: 44). The MARFIN report writes that “The Cape and Islands is third, following Downeast Maine (1) and Upper Mid-coast Maine (2), on the dependency index that is based on the employment indices used in this project [...] Despite gentrification, [Chatham, Vineyard Haven, and Sandwich] are actively engaged in the fishing industry” (Hall-Arber 2001: 144). The report also characterizes a number of specific ports on the Cape. For Sandwich, “Although fishing represents an historical activity, it has always been part of a mixed economy including tourism, agriculture, and transport” (*ibid*: 149); an estimated “200 households [are] directly dependent on commercial fishing, and an additional 70 households that are indirectly dependent on the fishing industry” (*ibid*: 151). Provincetown and its Portuguese fleet, the MARFIN report notes, “did not significantly diversify their economic activities and thus remained somewhat culturally and linguistically isolated” (*ibid*: 183), making it particularly vulnerable.

Work in the Mid-Atlantic has also profiled important fishing ports. “Barnegat Light is one of New Jersey’s most important ports. Many members of the East Coast’s longline fleet, scallop vessels, and a fleet of inshore gillnetters reside at this port. Recreational and charter boats also utilize and work from this port” (McCay and Cieri 2000: 48). Further, one resident estimated that “the commercial fishing industry (including charter and party boats) becomes the stalwart economic sector for the town in the winter through employing as many as 150 local people to work at the marinas. (According to the 1990 census, 12.6% of those employed at Barnegat Light were in fisheries.)” (*ibid*: 49). Though gentrification is of increasing concern, “the fisheries are perceived as part of the identity of this community” (*ibid*: 51). The McCay and Cieri report also

gives an indication of the scope of fishing businesses and infrastructure in Mid-Atlantic communities. For example in Chincoteague, “There is only one resident active dealer, but four out-of-town dealers uses this dock as a packing house. Seasonally, draggers and other fishermen come from other states to land their catches in Chincoteague, and there is a small local inshore and bay fishery as well as shellfish farming. There are several packing houses in Chincoteague, including a small cooperative” (ibid: 124).

6.5 Cumulative Impacts

6.5.1 Introduction

The term “cumulative effects” is defined in the Council of Environmental Quality’s (CEQ) regulations in 40 CFR Part 1508.7 as:

“The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.”

Cumulative effects are linked to incremental actions or policy changes that individually may have small outcomes, but that, in the aggregate and combined with other factors, can result in greater environmental effects on the affected environment. At the same time, the CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action on the universe; analyses focus on those effects that are truly meaningful. The Council of Environmental Quality also states that the range of alternatives considered must include the “no-action alternative as a baseline against which to evaluate cumulative impacts.” Therefore, the analyses in this document, referenced in the following cumulative impacts discussion, compare the likely effects of the proposed action to the no-action alternative.

Amendment 10 to the Sea Scallop FMP assessed all the principles identified by the CEQ guidance including the direct and indirect impacts on the natural and human environment, the cause and effect relationships of the measures being proposed, the synergistic interactions, the spatial and temporal boundaries of the action, and the capacity of the resource to accumulate additional effects. Section 5 of this document summarizes the current state of the scallop resource and scallop fishery, and provides additional information about habitat, protected resources, and non-target species that may be affected by the proposed action. The direct and indirect impacts of the proposed action and alternatives were analyzed for five VECs in the following sections:

1. **Scallop resource:** Section 6.1.4
2. **Non-Target Species:** Section 6.1.2
3. **Habitat: Section:** 6.1.3
4. **Protected Species:** 6.1.4
5. **Communities:** Sections 6.2 and 6.4

The following analysis will identify and characterize the impact on the environment by the proposed action when analyzed in the context of other past, present, and reasonably foreseeable

future actions. The analysis is generally qualitative in nature because of the limitations of estimating the effects of the proposed measures quantitatively.

6.5.2 Past and Present Actions

The management background and implementation of relevant management actions is more thoroughly described in Sections 3.3 and 3.4. In 1994, Amendment 4 instituted a limited access program and established a fishing effort reduction schedule in order to lower scallop fishing mortality and increase yield. Amendment 7 revised the DAS-reduction schedule in order to meet the mandates of the Fisheries Sustainable Act of 1996. In addition to these actions, Nantucket Lightship Area, CAI and CAII were closed to scallop fishing beginning in 1994, first by an emergency action, later by Amendment 7 to the Multispecies FMP. The management actions taken under the Sea Scallop FMP are summarized in Section 3.4, in Tables A and B. This section summarizes only those present actions related to VMS implementation for general category scallop fishery and broken trip program for the limited access vessels.

Few actions implemented by Sea Scallop FMP had a direct effect on vessels with general category scallop permits. Beginning in 1994, the Council has managed the Atlantic sea scallop fishery through limited access (LA) effort controls (NEFMC 1993). The limited access program assigned vessels with a history of scallop fishing to three broad classes and assigned each category a maximum number of days that a vessel may fish for sea scallops. Vessels that had sufficient history qualified for either a full-time, part-time, or occasional limited access permit. There were many vessels, however, that would not qualify for the LA permit as proposed. These vessels appeared to fall into one of the following two categories:

- Vessels that caught and landed scallops while targeting other species with bottom-tending mobile gear
- Vessels that targeted scallops with dredges and trawls on day-long trips

In both cases, the scallop landings were very often marketed by low-volume dealers and individuals, which made it difficult to document landings to qualify vessels for limited access. Because the scallop landings by these vessels were a small fraction of the total landings, the Council believed that landings and fishing effort by these vessels could be kept in check by establishing general category possession limit that will be applicable to scallop landings per trip. Amendment 4 thus established a new “general category” permit, regulated by a 400 lb. possession limit, gear regulations, a minimum 3½” size limit for shell-stock, and scallop area closures when implemented by the Scallop FMP. Amendment 10 increased the twine top mesh and minimum dredge ring size that apply to general category vessels using a scallop dredge. In addition, scallop fishing while not on a limited access DAS was restricted to a coastal exemption area bordering the coastline of eastern MA, NH, and ME.

Actual fishing effort by general category vessels remained low and their landings remained a small fraction of the scallop catch (<4%) until recently, with no further need to regulate the general category fishery. The vessels with general category permits were also exempted from the VMS requirements because of the same reasons, and also because to minimize the compliance costs for these vessels, many of which were small vessels that landed incidental amounts of scallops as a bycatch.

The issue of VMS requirement for the general category vessels arose later in connection with allowing fishing in controlled access areas for these vessels. Framework 11 did not provide access to general category vessels to parts of the Nantucket Lightship Area, Closed Area I, and Closed Area II on Georges Bank when these areas were opened to scallop fishing in 1999. This was because the re-opened areas were not in the exemption area where scallop fishing was allowed while not on a DAS. Providing general category access to scallop controlled access areas was reconsidered again in Framework Adjustment 14 (NEFMC 2001) when the Hudson. Canyon and VA/NC Areas re-opened to scallop fishing. Unlike the previous action, these areas were exempt from the Multispecies FMP restrictions and therefore the Scallop FMP could allow scallop fishing by vessels with general category permits. In fact, the Council considered allowing vessels with general category permits to fish with a 400 lb. scallop possession limit, with the condition that they carry a VMS and have a Letter of Authorization. The Council rejected this proposal because it could not be demonstrated that the benefits to the vessels would compensate for the VMS and administrative costs.

VMS requirement and proposed additional monitoring were reconsidered when Framework Adjustment 16/39 (NEFMC 2004) allowed access to and re-opened portions of the Georges Bank closed areas, due to concerns over groundfish bycatch and controlling the total catches of scallops. Under the recently approved regulations for Framework Adjustment 16/39, vessels with general category scallop permits may fish in the Georges Bank controlled access areas (inside of the Nantucket Lightship Area, Closed Area I, and Closed Area II), but are required to operate VMS equipment, make vessel trip reports with bycatch information, and carry observers if selected to do so. In addition, the general category fleet has a separate TAC and total number of trips that may be taken in each area. The results of this new program have not been evaluated because for the general category fishery will be able to fish in controlled access areas until the 2005 fishing year which starts in March.

Based on the cumulative impact assessment in Amendment 10 (Section 8.1) and Framework Adjustment 16/39 (Section 6.3), the impacts of these past and present measures concerning the general category scallop fishery) on five VECs could be summarized as follows:

- 1) **Scallop resource:** Because total fishing effort by these vessels were mostly uncontrolled and unmonitored, the regulations prior to Framework Action 16/39 possibly have had a negative cumulative impact on scallop yield from inshore scallop resources, and a marginal impact on the overall scallop resource. Some of these negative impacts could be offset by Framework 16/39 measures if it provides incentive for some general category vessels to fish in controlled access areas where scallops are abundant and to install a VMS as required for such access. Overall, the cumulative impacts of the past and present measures on the scallop resource could be slightly negative.
- 2) **Non-target species:** The effects on species that are customarily captured as bycatch in the scallop fishery are likely to be similar to those described above for the scallop resource. In general, those impacts are unquantified, but past and present actions concerning general category fishery may have had possible negative effects by encouraging near shore fishing in New England. On the other hand, requiring 4" rings and 10" twine tops for general category fishery is expected to have positive benefits, offsetting some of negative impacts on non-target species.
- 3) **Impacts on Habitat (Including EFH):** General category vessels primarily fish inshore and in areas with complex bottom. Thus this fishery has probably had negative impacts on EFH

like the other fisheries in the region. Because Amendment 10 and F16/39 allow general category vessels to fish in newly reopened areas, they will increase effort resulting in an indirect negative impact on EFH. These impacts are probably negligible given that the level of activity by general category vessels is small compared to other fishing activities in the region. Therefore, the overall cumulative impacts of past and present actions may be slightly negative for EFH.

4) **Impacts on Protected Species:** Because the takes in the general category scallop fishery are unknown, no cumulative effects are identified from the past and present actions concerning general category fishery.

5) **Impacts on Communities:** Past and present actions had positive cumulative impacts of the communities by giving smaller vessels an option to fish on a rebuild resource. General category fishery also helped to supply local scallop markets in small ports. Amendment 10 and Framework 16 is expected to increase the revenues of the general category vessels by allowing access to the re-opened areas. Although fishing costs will increase as well due to VMS and other reporting requirements for these vessels, general category vessels would access these areas only if their revenues from scallops exceed VMS costs. Therefore, cumulative effects the past and present actions on the communities are expected to be positive.

The broken trip exemption program was first established in Framework Adjustment 11, which authorized the Regional Administrator to use discretionary provisions to grant replacement trips for limited access scallop vessels that returned from a controlled access trip due to weather or emergencies. A pre-defined schedule that gave a partial rebate of days and pounds for trips returning early with landings below the possession limit was first considered in Framework Adjustment 15. The Council first rejected this alternative due to administrative and enforcement concerns. This program was reconsidered in Amendment 10, to apply to controlled access trips as part of area rotation management. The new exemption was deemed more acceptable, because it relieved the problems associated with the program that was first adopted in Framework Adjustment 11.

The Scallop FMP allowed controlled access to portions of the Georges Bank closed groundfish areas in 1998 and 1999, and to the Hudson Canyon and VA/NC closed scallop areas in 2000-2003. During this time, vessels that took a trip to these areas were charged a minimum of 10 DAS, regardless of how long the vessel took to catch the applicable possession limit. This automatic DAS charge counted against the vessel's annual DAS allocation, regardless of how much scallop landings occurred as long as the vessel entered the controlled access area for scallop fishing.

Initially, whether a vessel received a rebate on DAS due to an early trip termination (i.e. a "broken trip") for weather or other circumstances was determined by the Regional Administrator. Rebates were often given to vessels that landed no scallops or for exceptional weather conditions, like hurricanes. Due to the risk of losing days, however, the Council liberalized this procedure in Amendment 10 to the FMP, which was implemented in July 2004. The broken trip provision in Amendment 10 allowed a vessel to return early from a controlled access trip and have a large part of its automatic DAS charge and potential scallop landings applied to a future replacement trip. For the broken trip, the vessel's annual allocation for a controlled access area was charged one DAS for each 10% of the scallop possession limit actually landed, plus two DAS. For example, a vessel with a broken trip landing 6,000 lbs. on a broken trip would be accorded an allocation of 9,000 lbs. and 6 DAS on a future replacement trip. As a result, this vessel would

land a total of 15,000 lb. of scallops from the broken and replacement trip, instead of the full 18,000 lb. of scallops if the original trip was not discontinued (see table in Section 1.3.2).

The impacts of these past and present measures regarding broken trips on five VECs are summarized as follows:

- 1) **Scallop resource:** The past and present actions probably had slightly positive cumulative impacts by allowing the FMP to meet area-specific mortality targets and maximize sustainable yield. This was because the broken trip program allowed vessels to land a major part of their trip allocations from the access areas by taking replacement trips at an automatic charge.
- 2) **Non-target species:** The cumulative impacts on non-target species were slightly positive because broken-trip program encouraged DAS use in controlled access areas where fishing time per DAS and per unit of scallop landings were low.
- 3) **Impacts on Habitat (Including EFH):** Overall, the past and present actions had neutral cumulative impacts on EFH, but if significantly more vessels participate in access programs as a result of this adjustment for broken trips, then the EFH in outside areas may benefit.
- 4) **Impacts on Protected Species:** No cumulative impacts on the protected species were identified in Amendment 10. On the other hand, if impacts on protected species decline with fishing time, broken trip program in Amendment 10 and Framework 16/39 probably had slight positive impacts by encouraging fishing in the controlled access areas, which reduces total fishing time.
- 5) **Impacts on Communities:** Past and present actions had positive cumulative impacts on communities by reducing the business risk of losing controlled access area DAS and trip allocations from broken trips. The existing broken trip program also reduced negative safety impacts by allowing vessels to make a more rational choice to terminate a trip early due to adverse conditions.

6.5.3 Reasonably foreseeable future actions

Further restrictions on the scallop general category fishery including the control date and possible limited access. The Council passed a control date for the general category fishery that was published on November 1, 2004. This action indicates that the Council is concerned about increased entry and possibly increased scallop landings by general category vessels. Currently the General Category fishery is an open access fishery and the number of vessels with general category permits has increased by 30% over the period 1994 to 2003. Anecdotal reports indicate that the number of general category permits still is increasing.

The increase in the number of general category permits raises concerns that the fishing mortality from this sector will increase because there is no mechanism that automatically adjusts general category fishing effort. To date, this has not been a major concern because general category landings have comprised only about 2 percent of total scallop landings. However, with increased catch rates, high prices for scallops and diminished opportunities in other fisheries, effort in this fishery probably will continue to increase.

If general category landings have increased substantially the Council will have to take action to protect its conservation program for scallops. However, at present, it is not clear whether

action will be required or, if so, whether the Council will cap general category landings with a quota or will limit access to the general category fishery as part of an effort control program.

None of these foreseeable actions will result in additional cumulative effects on the scallop or other fisheries in combination with the removal of the broken trip disincentive.

Two groups of vessels might be affected differently in terms of additional cumulative effects of a the control date and the proposed VMS requirement: 1) vessels that have landed more than 40 pounds on a single trip in the past and are expected to do so in the future; and 2) vessels that have not landed more than 40 pounds on a single trip in the past but might do so for the sole purpose of establishing a history of higher landings in case it might affect their qualification under possible limited access in the future. Impacts on the first group are fully captured in the analysis of impacts in section 6.2 and as a result there are no additional cumulative effects impacts expected from the establishment of the control date.

However, the proposed action may have additional cumulative social and economic impacts on the second group of vessel owners because they will have to acquire VMS if they land more than 40 pounds of scallops on a single fishing trip to establish a higher level of participation in the fishery. For these vessels, installing a VMS may cost more than they earn from landing scallops. It is not possible to estimate any impacts because and they will depend on the number of vessels that change their fishing behavior and the extent of their scallop landings. The VMS requirement itself should not affect the level of landings or effort by this vessel group because their primary incentive would be to establish a history of landings rather than recovering the cost of installing a VMS unit.

Other scallop management actions –The effects of interactions with adjustments to current scallop management plan provisions such as overall DAS, allocations, the rotational area management plan and other provisions are captured in the analyses of in sections 6.2. In summary, the VMS requirement is expected to have positive effects on the scallop management program by reducing non-compliance with general category possession limits. The removal of the broken trip disincentive is not expected to have any impact on the resource and is not expected to result in any cumulative effects as the result of changes to current management measures because it removes an existing requirement.

Non-fishing Impacts – There are several non-fishing actions that could potentially impact sea scallop fishery. Two project types currently proposed by non-fishing sources have the potential to impact EFH.

Liquid natural gas (LNG) terminals: There are approximately 11 LNG projects in various stages of the approval process (i.e., existing with approved expansions, approved, proposed, or planned) in the northeast region of the U.S. Only two onshore LNG projects have been constructed, one in Everett, MA and one in Cove Point, MD. LNG facilities are currently being proposed or planned for construction in Pleasant Point, ME (onshore); two projects offshore of Boston, MA area and one in Somerset, MA (onshore); Providence, RI (onshore); Long Island Sound, NY (onshore); Logan Township, NJ (onshore); Philadelphia, PA (onshore); and an expansion of an existing facility in Cove Point, MD.

Offshore wind energy generation projects: Although only two offshore wind energy projects have formally been proposed in the northeast region, at least 20 other separate projects may be

proposed in the near future. Cape Wind Associates (CWA) proposes to construct a wind farm on Horseshoe Shoal, located between Cape Cod and Nantucket in Nantucket Sound, Massachusetts. A second project is proposed by the Long Island Power Authority (LIPA) off Long Island, New York. The CWA project would have 130 wind turbines located as close as 4.1 miles offshore of Cape Cod in an area of approximately 24 square miles with the turbines being placed at a minimum of 1/3 mile apart. The turbines will be interconnected by cables, which will relay the energy to shore to the power grid.

Other non-fishing activities include: chemical (e.g. pesticides and oil pollution), biological (e.g. invasive species and pathogens), and physical (e.g. dredging and disposal, coastal development) disturbances to riverine, inshore and offshore fish habitats; power plant operations (thermal pollution and entrainment of larvae); global warming; and energy projects such as liquid natural gas (LNG) facilities and windfarms. The majority of these activities tend to affect inshore areas, and the impacts are often localized.

Atlantic sea scallops (*Placopecten magellanicus*) are found on the continental shelf of the northwest Atlantic, from the Gulf of St. Lawrence south to Cape Hatteras (Packer et al. 1999). Benthic life stages occur at depths from shore out to approximately 110 m. Scallop eggs are heavier than seawater and are thought to remain on the bottom during development, but the functional value of this habitat for eggs is unknown. Larsen and Lee (1978) indicated that spat may obtain a survival advantage in areas of increased structure, including sessile branching plants and animals. The availability of suitable hard surfaces on which to settle appears to be a primary requirement for successful reproduction (Packer et al. 1999). There is a close association between the bryozoan, *Eucratea loricata*, and spat. *Eucratea* attach to adult scallops, and have been found to contain large numbers of spat (Packer et al. 1999). Juvenile scallops (spat) are very delicate and do not survive on shifting sand bottoms (Packer et al. 1999). Adults are found in benthic habitats with some water movement, which is critical for feeding, oxygen and removal of waste; optimal growth for adults occurs at currents of 10 cm/sec (Packer et al. 1999). Adult scallops inhabit coarse substrates, usually gravel, shell, and rocks. They are less likely to be found in areas with fine clay particles. Since scallops depend on very specific environments with which to settle and grow, the impacts to this species of non-fishing activities such as oil pollution, dredging activities, and coastal development are likely high. However, if these impacts are largely localized and inshore, then the impacts may be minimal as a whole. Similarly, as discussed in the paragraphs below, the potential impacts associated with LNGs and windfarms are also localized but may impact the scallop fishery with more than minimal impact depending on location of the project and the extent of its effects.

LNG is transported via tanker to specialized terminals at a super-cooled temperatures of -260 degrees F. Upon arrival, the LNG is warmed by using either seawater (open loop system) or an enclosed heating medium/liquid (closed loop system), within a regassification facility. At this point, LNG can be transported into existing pipelines. Depending on the specific location and type of LNG facility, a range of impacts to fisheries and/or fisheries habitat may result from both construction and operation of terminals.

Due to the large size of LNG tankers, dredging may need to occur in order to access onshore terminals. Dredging can result in direct loss of fish and/or shellfish habitat and can elevate levels of suspended sediment within the water column. As with other dredging, suspended sediments can impact various life stages of fish and shellfish. The construction of pipelines and fill

associated with site construction can have adverse impacts on intertidal habitats and salt marshes in the area.

In addition, the operation of LNG facilities can have adverse effects on fishery habitats. Ballast water intakes for LNG vessels as well as intakes for regassification facilities can impinge and entrain fish eggs and larvae and can have a significant impact on coastal ecosystems. Closed loop systems that do not use seawater for regassification can help to reduce this impact. If open loop systems are utilized, water is generally returned to the waterbody at cooler temperatures. Depending on the location of the discharge, changes in temperature have the potential to alter ecosystems and obstruct anadromous fish passage. For LNG facilities located offshore, anchor lines and increases in vessel traffic have the potential to impact protected resources in the area. Due to the potentially hazardous nature of the facilities, security zones are generally established around LNG facilities. Depending on the location of the facility, this can restrict access to areas traditionally utilized for fishing and shellfishing. A list of constructed, approved, and proposed LNG projects is provided in the above discussion of RFF actions.

There are currently ten operational offshore wind energy generation facilities throughout the world and approximately 12 in various stages of proposal (British Wind Energy Association website: <http://www.bwea.com/offshore/worldwide.html>). Only two projects are formally proposed in the U.S., but at least 20 other separate projects may be proposed in the near future. The Army Corps of Engineers, New England District has developed a draft environmental impact statement (DEIS) and has completed a scoping process for the proposed Cape Wind Associates (CWA) project on Horseshoe Shoal. The DEIS will assess potential impacts from the project to recreational and commercial fisheries, endangered species, cultural resources, visual resources, benthic communities, avian resources, navigation and aeronautical activities. The potential impacts associated with the CWA offshore wind energy project include the construction, operation and removal of turbine platforms and transmission cables; thermal and vibration impacts; changes to species assemblages within the area from the introduction of vertical structures, and the cumulative impacts on the resources and habitats of Nantucket Sound.

Although wind energy has the ability to produce a renewable, clean energy source that will reduce the use of, and dependence on, fossil fuels, there is much controversy associated with potential user group and aesthetic impacts. Once constructed, the turbines would preempt other bottom uses in an area similar to oil and natural gas leases. Agencies responsible for such leases have no established authority for reviewing or permitting renewable energy projects, and legislation has been introduced in recent years to expand federal authority to grant easements in the outer continental shelf to include wind farms and other renewable energy projects. To date none of the submitted bills have passed.

In terms of impacts on protected species, there are other sources of human-induced mortality and/or harassment of turtles in the action area. These include incidental takes in state-regulated fishing activities, vessel collisions, ingestion of plastic debris, and pollution. While the combination of these activities may affect populations of endangered and threatened sea turtles, preventing or slowing a species' recovery, the magnitude of these effects is currently unknown.

State Water Fisheries - Fishing activities are considered one of the most significant causes of death and serious injury for sea turtles. A 1990 National Research Council report estimated that 550 to 5,500 sea turtles (juvenile and adult loggerheads and Kemp's ridleys) die each year from all other fishing activities besides shrimp fishing. Fishing gear in state waters, including bottom

trawls, gillnets, trap/pot gear, and pound nets, take sea turtles each year. However, information on the takes is limited. Given that state managed commercial and recreational fisheries along the Atlantic coast are expected to continue within the action area in the foreseeable future, additional takes of sea turtles in these fisheries is anticipated.

Vessel Interactions - NOAA Fisheries STSSN data indicate that interactions with small recreational vessels are responsible for a large number of sea turtles stranded each year within the action area. Collision with boats can stun or easily kill sea turtles, and many stranded turtles have obvious propeller or collision marks (R. Boettcher, pers. comm.).

Pollution and Contaminants - Marine debris (e.g., discarded fishing line or lines from boats) can entangle turtles in the water and drown them. Turtles commonly ingest plastic or mistake debris for food. Chemical contaminants may also have an effect on sea turtle reproduction and survival. While the effects of contaminants on turtles is relatively unclear, pollution may be linked to the fibropapilloma virus that kills many turtles each year (NOAA Fisheries 1997). If pollution is not the causal agent, it may make sea turtles more susceptible to disease by weakening their immune systems. Excessive turbidity due to coastal development and/or construction sites could influence sea turtle foraging ability. As mentioned previously, turtles are not very easily affected by changes in water quality or increased suspended sediments, but if these alterations make habitat less suitable for turtles and hinder their capability to forage, eventually they would tend to leave or avoid these less desirable areas (Ruben and Morreale 1999).

6.5.4 Cumulative impacts on the sea scallop resource

Cumulative impacts of the past, present, and reasonably foreseeable actions were recently analyzed in Amendment 10 to the Sea Scallop FMP. Overall, the FMP determined that cumulative impacts of the past and present actions, when evaluated in totality, were positive for the scallop resource and fishery even though the impacts of some specific measures may have been slightly negative. As a result of the past and present actions, coupled with above average recruitment in the Mid-Atlantic region, scallop biomass had risen in 2003 to the biomass targets, five years earlier than planned. More importantly, fishing mortality has been lowered to around F_{max} ($F=0.20$) for the resource. Amendment 10 to the Sea Scallop FMP is expected to protect the resource from overexploitation and maintain a sustainable fishery. Rotation area management implemented by Amendment 10 is expected to have a cumulative positive impact by increasing yield-per-recruit and helping to stabilize scallop yield over the long term. Access to Georges Bank groundfish areas with the Framework 16 regulations is expected to have positive impacts on the scallop resource and fishery, particularly in the New England region. The fishery will have access to large scallops whose biomass has stopped growing, allowing a decrease in fishing mortality on scallops in open areas where growth is higher.

The direct and indirect impacts of the VMS requirement on the sea scallop resource is expected to be slightly positive as discussed in Section 6.1 and summarized below. Although the proposed management measures do not change the level of fishing effort or authorized catch, the added VMS cost may discourage new entrants in to the general category fishery. On the other hand, some vessels may increase their scallop landings to recoup part of the costs for VMS. These changes in fishing behavior and effort will probably be marginal since no change in scallop possession limits, the number of authorized trips, or other allocations is being proposed at this time. There may be some positive indirect effects on the scallop resource in the long-term, however, associated with better monitoring of possession general category possession limit, better

reporting of scallop landings and knowledge about the distribution of scallop fishing effort. The other benefit would be better monitoring of area boundaries that are a part of rotational area management. For these reasons, proposed VMS implementation may have slightly positive cumulative impacts on the scallop resource.

The cumulative impacts of suspending the broken trip disincentive are not expected to be different than those described in Amendment 10 in conjunction with the provisions for controlled area access. It is also highly unlikely for the proposed change in the broken trip program to cause overfishing, because the FMP already has a built-in 20% buffer between the fishing mortality target and the threshold that defines overfishing. Furthermore, the controlled access trip allocations were made as if there were no broken trips and the entire allocated catch had been taken by the fleet. Given the high biomass in controlled access areas and the opportunity for future TAC adjustment, marginal changes in actual catches from the removal of the two DAS/3,000 lbs. replacement trip charge will have no meaningful impact on the scallop resource and fishery. For the same reasons, providing rebates of charges against replacement trips is not expected have biological consequences on the scallop resource and fishery.

In conclusion, the impacts of the proposed action on the scallop resource are expected to be positive for the VMS requirement and neutral for the suspension of the broken trip disincentive (see section 6.1.1.2) and therefore the overall impacts are expected to be positive. Consequently, these positive impacts will mitigate but not outweigh the slightly negative cumulative impacts on the scallop resource of past and present management measures for the general category fishery.

6.5.5 Cumulative impacts on the non-target Species

There are no direct effects anticipated from Framework 17 action on non-target species, or finfish bycatch as long as the scallop catches and total expected fishing effort remains at the levels that were allocated by Amendment 10 and Framework Adjustment 16/39. Most relevant to the cumulative effects on vulnerable finfish resources, caught as bycatch in the scallop fishery, are the reductions in total effort allocations, gear changes that allow more escapement and better survival of finfish, and the effect of the groundfish closed areas on scallop fishing. The proposed action does not change, however, the amount of authorized fishing, gear configurations and other regulations that effect bycatch. Similarly, the distribution of fishing effort is not expected to change in response to the proposed VMS requirement and revised provisions for broken trip program. Replacement trips would be taken in the area where the broken trip occurred and while the area is open for scallop fishing.

There may be some indirect effects from the proposed action, however, if fishing effort increase due to vessels trying to recoup the compliance costs, resulting in a proportional increase in finfish bycatch. If on the other hand, the added VMS cost discourages additional participation in the general category scallop fishery, it could have a beneficial effect of reducing finfish bycatch. Therefore, any increase in effort will probably marginal with negligible impact on finfish bycatch. In addition, there could be some beneficial indirect impacts on non-target species because VMS data provides information about the distribution of fishing by vessels with general category permits, which may be helpful for assessing bycatch hotspots and the seasons when finfish bycatch may be a problem. As a result, the overall direct and indirect impacts of VMS requirement could be positive for non-target species.

In conclusion, the impacts of the proposed action on the non-target species could be positive for the VMS requirement and neutral for the suspension of the broken trip disincentive (see section 6.1.2) and therefore the overall impacts are expected to be slightly positive. Consequently, these positive impacts will mitigate but not outweigh the slightly negative cumulative impacts on the scallop resource of past and present management measures for the general category fishery .

6.5.6 Cumulative impacts on Protected Species

The proposed action is not expected to have an adverse impact on sea turtles, which have been caught by scallop fishing gear. The Biological Opinion prepared for Amendment 10 to the Scallop FMP found that the scallop management program is not likely to jeopardize the continued existence of endangered and threatened species. Section 6.1.4 describes and summarizes the expected impacts of the proposed action on protected species, including threatened, endangered and other protected species.

The proposed action is not expected to directly affect protected species or critical habitat of these species. It is not expected to appreciably change the amount or distribution of fishing effort by general category scallop fishery. Indirectly, however, more detailed reporting on catch, and in particular effort distribution and possibly other information, may enable managers to better evaluate the impacts of this on endangered or threatened species, marine mammals, or critical habitat of these species. No changes in impacts on endangered species and protected resources is expected from liberalizing the broken trip exemption program, as long as the scallop catches and total expected fishing effort remains at the levels that were allocated by Amendment 10 and Framework Adjustment 16/39. Replacement trips would be taken in the area where the broken trip occurred and while the area is open for scallop fishing. Therefore, the proposed action in this framework adjustment does not appear to have any adverse cumulative effects on protected species that would alter the prognosis for impacts of fishing under Amendment 10 and Framework Adjustment 16/39. In other words, the cumulative impacts of the proposed action is not expected to be different in any significant way than those described in Amendment 10 to the Scallop FMP and Framework Adjustment 16/39.

6.5.7 Cumulative impacts on Habitat

Essential Fish Habitat (EFH) includes all marine habitats deemed essential to the well-being and reproduction of managed marine species. The geographical distribution and characteristics of EFH are defined in the management plans that regulate the fisheries targeting marine species. Section 6.1.3 describes and summarizes the expected impacts of this action on essential fish habitat, focusing on the proposed action. Overall habitat impacts of all the measures combined in this action have neutral impacts on habitat, compared to the habitat benefits that will result from implementation of Amendment 10 of the Scallop FMP.

Because the potential adverse impacts of trawls and dredges are so similar bottom otter trawls and scallop dredges can be considered as a group and their cumulative effects as a function of the fishing activity of the two gears added together. In state waters, which are designated as EFH for one or more species in the multi-species assemblage, the cumulative effects of mobile, bottom-tending gear would also include adverse impacts from other types of dredges listed in Appendix VI to Amendment 10. The combined effect of otter trawls and scallop dredges was ranked considerably higher in gravel (and other hard-bottom habitats) than in sand (ranked second) and mud (ranked third)). Impacts on biological structure were considered to be more severe than

impacts on physical structure, with removal of major physical features ranking third). A fourth effect, changes in benthic prey, was not adequately evaluated because there was not enough information available. Combined impacts to gravel and sand habitat were primarily to biological structure, with gravel ranking higher than sand. Impacts on physical structure were judged to be the same in gravel and sand. Impacts in mud ranked low, with removal of major physical structures scoring higher than impacts to physical and biological structure.

The cumulative effect of the proposed action on habitat, when viewed in context of the habitat protection measures implemented in Amendment 10 and Framework 16 to the Atlantic sea scallop, as well as actions taken in Multispecies and Monkfish FMPs, is minimal and not significant. The effort allocation is unchanged and the range of impacts is within what was analyzed in Amendment 10.

6.5.8 Cumulative Impacts on Communities

The impacts of the proposed regulations on vessels and the communities were discussed in detail in Section 6.3 (Economic Impacts) and 6.4 (Social Impacts) of this document. Although the VMS implementation will increase the fishing costs for a relatively small subset of vessels with general category permits, it is not expected to reduce significantly the revenues and profits of most of these vessels required to install and operate a VMS. Proposed action will minimize the negative economic impacts of VMS implementation by providing the flexibility to any general category vessel retain its permit without having a VMS on board as long as scallop catch is limited to the incidental amount (40 lb.) per trip. Therefore, many vessels that do not land any or land only a small amount of scallops per trip could avoid VMS costs without experiencing a significant amount of revenue loss and without giving up their general category permit. For other general category vessels that already earn significant amounts of revenue from scallop trips in excess of the VMS costs, there could be an opportunity to recover these costs fully or in part by taking more trips and/or by increasing the scallop catch per trip (See Section 7.11, IRFA). By allowing vessels to power-down VMS while they are at a dock or mooring, the proposed action is expected to reduce compliance costs to vessels.

More importantly, the VMS implementation is expected to have indirect positive economic impacts for the scallop fishery by improving compliance with the general category possession limit, and thereby by preventing an unexpected increase in overfishing due to illegal landings. If scallop mortality increase beyond sustainable levels due to violations of the possession limit, the future yield and revenues from the scallop resource could decline, negatively impacting both the limited access and general category vessels. Both the limited access and the general category vessels will benefit from better management of the scallop resource made possible by better data on the location of the fishing activity. These benefits from VMS implementation are expected to outweigh the VMS costs over the long-term.

Suspending the broken trip charge and rebates of charges on replacement trips will have positive economic impacts by reducing losses from broken trips for the limited access scallop vessels that fish in controlled access areas. Both VMS implementation and the broken trip provisions will improve safety-at-sea, thus will have positive impacts on the participants in scallop fishery and their communities.

Therefore, although VMS requirement will increase costs for about 10% of the vessels with general category permits (223 vessels out of a total 2,554 vessels with general category permits),

the proposed action is expected to have positive cumulative impacts on the communities by improving safety, by reducing losses from broken trips and by better monitoring of the possession limit, benefiting both limited access and general category vessels participating in the scallop fishery.

7 APPLICABLE LAW

7.1 *Magnuson-Stevens Fishery Conservation and Management Act (Including National Standards)*

7.1.1 Consistency with National Standards

7.1.1.1 National Standard 1: Overfishing and Optimum Yield

“Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry. “

The biological reference points and control rule for Atlantic sea scallops was revised and updated in Amendment 10 to the FMP. The recent 2003 survey data indicated that the scallop biomass is above the MSY biomass target and will remain above this level for the foreseeable future under either the proposed action or the no action alternative. Also the updated analysis indicated that fishing mortality will remain below the overfishing threshold mortality rate, F_{max} , either with the proposed action or the No Action alternative.

The proposed action is not expected to cause overfishing to occur or to cause the stock to become overfished (see Section 6.1.1). Requiring VMS on vessels with general category scallop permits is not expected to have any direct change of impacts on biological resources. Similarly, allowing vessels to power-down while they are in port is not expected to have adverse effects on the scallop resource or to cause overfishing. There are no changes proposed in the scallop possession limits, the number of authorized trips, or the amount of fishing authorized or expected to occur.

Furthermore, the proposed action is expected to improve the FMPs ability to produce optimum yield. due to the indirect benefits on the sea scallop resource. A vessel monitoring system (VMS) will enable law enforcement personnel to locate general category vessels participating in the scallop fishery, thus improving enforcement's ability to deploy personnel and other resources in monitoring vessel offloads. The improvement in enforcement's effectiveness in monitoring the possession limit and the resulting increase in compliance may help to prevent fishing mortality from increasing beyond the sustainable levels due to illegal landings in excess of the 400 lb. general category possession limit. VMS will also provide better data for fishery management for monitoring the area boundaries that are a part of rotational area management. Such benefits for scallop management will help to maintain the optimum yield from the fishery.

The removal of the broken trip program disincentive is not expected to have any biological consequences or to cause overfishing. The Scallop FMP already has a built-in 20% buffer between the fishing mortality target and the threshold that defines overfishing. Furthermore, Framework 16/39 controlled access trip allocations were based on the assumption that there will be no broken trips and the entire allocated catch will be taken by the scallop fleet. Therefore, broken trip replacements where the combined catch equals the total allowed for the original trip