

SUMMARY AND INTEGRATION OF IMPACT ANALYSIS FINDINGS

CHAPTER 8

This chapter summarizes and integrates the findings of the biological, economic, and social impact analyses from the preceding chapters, allowing a broad assessment of the relative merits of the regulatory alternatives considered in this environmental impact statement.

8.1 BIOLOGICAL IMPACTS

8.1.1 Impacts on Whales

Gear modification requirements are a key component of the changes to the Atlantic Large Whale Take Reduction Plan (ALWTRP) that are under consideration. The major requirements affecting whale survival include:

- **Groundline Requirements:** The requirement to use sinking and/or neutrally buoyant groundline is designed to reduce the likelihood of interactions between large whales and fishing gear by reducing the amount of line in the water column. Thus, requiring the use of sinking and/or neutrally buoyant groundline would directly benefit large whales by reducing the likelihood of entanglement.
- **Buoy Line Requirements:** The regulatory changes under consideration would extend universal buoy line requirements (which prohibit any portion of the buoy line floating at the surface) to a number of new fisheries. The extension of this requirement to these fisheries could benefit large whales by reducing the frequency or severity of entanglement in buoy lines and associated gear.
- **Weak Link and Anchoring Requirements:** The potential regulatory changes analyzed include provisions requiring that gillnet (except drift and shark gillnet), lobster and other trap/pot gear employ weak links on all buoy lines. The specified strength and placement of weak links is designed so that, if a large whale does become entangled, it could exert

enough force to break the weak link and break free of the gear. Thus, the risk of serious injury or mortality would be reduced.

- **Set Restrictions and Gear Stowing Requirements:** The potential regulatory changes under analysis include several restrictions on where and when gillnet gear could be used. The night set restrictions under consideration are designed to reduce the risk that poor visibility would contribute to an entanglement; the prohibition on the use of strikenets when visibility is less than 500 yards has a similar purpose. The requirement that driftnet vessels in the Northeast and Mid-Atlantic remove their gear from the water and stow it on board before returning to port is designed to ensure that any interactions between driftnets and whales would be observed and reported in a timely fashion, permitting a more rapid response.

In addition to gear modification requirements, the potential changes to the ALWTRP include a range of restrictions on the location and timing of fishing activity. These include the expansion of the SAM zone under Alternatives 5, 6 Draft*, and 6 Final (Preferred); seasonal closures of newly regulated fisheries in restricted areas; expansion of the geographic scope of monitoring and restricted areas under Alternatives 2 through 6 Draft*; changes to exempted waters in the Northeast and Mid-Atlantic; deep water exemptions; inclusion of other trap/pot vessels in the SAM and DAM programs; and the inclusion of seasonal restrictions on fishing activity in the Southeast and/or Mid-Atlantic. The general objective of all these potential changes is to limit the frequency and severity of interactions between whales and regulated trap/pot and gillnet gear while avoiding implementation of costly requirements that yield limited risk reduction.

8.1.2 Other Biological Impacts

In addition to impacts on large whale species, changes to ALWTRP regulations may affect other aspects of the marine environment, including other protected species, essential fish habitat, and directed catch and bycatch in affected fisheries. Analysis of these issues, addressed in Section 5.2 of this EIS, suggests no significant differences among Alternatives 2 through 6 Final (Preferred) with respect to impacts on essential fish habitat, directed catch, or bycatch; in each case, the impacts are generally expected to be minor. The alternatives differ, however, with respect to the ancillary benefits they would afford other protected species. These differences stem from differences in the extent to which the alternatives would mandate broad-based gear modification requirements that could prove beneficial to potentially affected species of whales, porpoises, dolphins, seals, and sea turtles. Under Alternative 5, for example, broad-based gear modification requirements would not be instituted; as a result, any ancillary benefits to other protected species would be limited primarily to those associated with the expansion of SAM requirements to additional fisheries and additional areas, to the extent that other protected species are present in these areas during the times that the requirements are in effect. Under Alternative 2, however, broad-based gear modification requirements would be in effect in all ALWTRP-

regulated waters at all times; thus, protected species that inhabit Mid-Atlantic or Southeast waters year-round, such as bottlenose dolphins, would benefit from these requirements throughout the year. Alternatives 3*, 4, 6 Draft*, and 6 Final (Preferred) would also apply broad-based gear modification requirements, but would do so on a seasonal basis in the Mid-Atlantic and Southeast; during the periods that these requirements would be in effect, they would offer ancillary benefits to other protected species.

8.1.3 Comparison of Biological Impacts Across Alternatives

The biological impacts analysis incorporates quantitative and qualitative indicators that facilitate comparison of the impact of the regulatory alternatives on potential entanglement risks (see Exhibit 8-1). These indicators suggest that, aside from Alternative 1 (No Action), Alternative 5 is the only regulatory alternative that differs significantly from the others. The impacts associated with Alternative 5 would be significantly less than those associated with Alternatives 2 through 4, 6 Draft*, and 6 Final (Preferred), primarily because Alternative 5 would not impose as broad a set of gear modification requirements.

The most notable differences in the estimated impacts of Alternative 6 Final (Preferred) and Alternatives 2, 3*, 4, and 6 Draft* are primarily attributable to differences between Alternative 6 Final (Preferred) and the other alternatives in the designation of exempted areas. As Exhibit 8-1 indicates, Alternative 6 Final (Preferred) would require vessels to convert an estimated 23.9 million fathoms of groundline from floating to sinking and/or neutrally buoyant line; this figure is approximately 77 percent of the total that would be converted to sinking and/or neutrally buoyant line under Alternatives 2, 3*, 4, and 6 Draft*. Similarly, Alternative 6 Final (Preferred) would require weak links to be installed on all flotation and/or weighted devices attached to 24.8 million fathoms of buoy line, approximately 81 to 82 percent of the total length of buoy line that would be affected by this requirement under Alternatives 2, 3*, 4, and 6 Draft*.

The differences between Alternative 6 Final (Preferred) and Alternatives 2, 3*, 4, and 6 Draft* on the two indicators noted above likely overstate any actual differences in the degree to which these alternatives would reduce entanglement risks. The designation of exempted areas under each of these alternatives is based on a review of large whale sightings data to determine where whales are likely to be found. While Alternative 6 Final (Preferred) would exempt areas off the coast of Maine and in Long Island Sound that would be regulated under Alternatives 2, 3*, 4, and 6 Draft*, whales are unlikely to occur in these areas. As a result, Alternatives 2, 3*, 4, and 6 Draft* would likely offer little additional risk reduction relative to Alternative 6 Final (Preferred).

Exhibit 8-1							
COMPARISON OF IMPACTS BY ALTERNATIVE: QUANTITATIVE RISK REDUCTION INDICATORS ¹							
	Regulatory Alternatives						
	No Action 1	2	3*	4	5	6 Draft*	6 Final (Preferred)
Changes in the Number of Affected Vessels							
Newly regulated lobster trap/pot vessels	0	11	10	11	10	10	5
Newly regulated gillnet vessels ²	0	616	604	615	604	604	604
Newly regulated other trap/pot vessels	0	418	416	418	416	416	431
Major Gear Requirements							
Fathoms of groundline converted (millions) ³	0	31.2	31.1	31.2	0.2	31.1	23.9
Fathoms of buoy line with weak links installed on all flotation and/or weighted devices (millions)	0	30.7	30.6	30.7	30.6	30.6	24.8
Number of weak links installed on all flotation and/or weighted devices off the main buoy line (thousands)	0	345.7	344.7	345.7	344.7	344.7	281.4
Number of gillnet net panels with multiple weak links installed (thousands)	0	125.9	124.9	125.9	2.0	125.0	126.7
Number of gillnet net panels with 1 weak link installed (thousands)	0	60.7	59.6	60.6	118.6	59.6	59.6
Number of gillnet strings with anchors installed (thousands)	0	2.9	2.9	2.9	<0.1	2.9	2.9
Number of new gear marks (millions)	0	2.2	2.2	2.2	2.2	2.2	0.3
Set and Stow Restrictions							
Newly affected vessels - night set restrictions ²	0	56	44	45	44	44	44
Newly affected vessels - gear stowing restrictions ²	0	614	604	614	604	604	604
Newly affected vessels - one buoy line per trawl of four traps or fewer ⁴	0	20	20	20	20	20	NA
Right Whale Area Restrictions⁵							
Newly regulated vessels in Great South Channel (April 1 – June 30)	0	<1	<1	<1	<1	<1	<1
Newly regulated vessels in Cape Cod Bay (January 1 – May 15)	0	2	2	2	2	2	2
Fathoms of buoy line converted in Cape Cod Bay (January 1 – May 15)	0	1,349	1,349	1,349	1,349	1,349	1,349
SAM Program⁶							
Newly regulated vessels in SAM program ^{6,7}	0	<1	<1	<1	24	24	25
Fathoms of buoy line converted ^{6,8}	0	924	924	924	24,483	25,331	25,331
Number of buoy lines eliminated ⁶	0	7	7	7	NA	NA	NA
DAM Program⁹							
Newly regulated vessels in DAM program	0	267	266	267	NA	NA	NA
Fathoms of buoy line converted (thousands)	0	369.7	368.8	369.7	NA	NA	NA
Seasonality							
Area-Days: Trap/pot (millions) ¹⁰	0	91.9	65.2	78.6	65.2	65.2	65.1
Area-Days: Gillnet (millions) ¹⁰	0	92.8	65.5	78.9	65.5	65.5	65.4
Key: NA = not applicable * = Specified as a Preferred Alternative in the DEIS							
Notes:							
¹ Numbers presented in this table represent changes incremental to the baseline. Since Alternative 1 is equivalent to no action, all values equal zero.							
² Estimates of newly regulated vessels assume that 50 percent of Mid-Atlantic driftnet vessels are currently regulated by ALWTRP requirements that apply in the Mid-Atlantic from December 1 through March 31. All others (i.e., those active only between April 1 and November 30) would be newly regulated.							
³ This number includes groundline that would be converted as a result of SAM, DAM, and Cape Cod Bay Restricted Area requirements, as well as groundline that would be converted as a result of broad-based gear modification requirements.							
⁴ This restriction is a new requirement for other trap/pot vessels fishing in Northern Nearshore waters and Stellwagen Bank/Jeffreys Ledge.							
⁵ The use of driftnets or anchored float gillnets would be prohibited in the Cape Cod Bay Restricted Area from January 1 through May 15, and in the Great South Channel Restricted Gillnet Area from April 1 through June 30. The use of mixed species trap/pot gear would be prohibited in the Great South Channel Restricted Area from April 1 through June 30.							
⁶ Under Alternatives 2, 3*, 4, 6 Draft*, and 6 Final (Preferred), the SAM program and all gear requirements unique to this program would be eliminated 12 months after publication of the final rule.							
⁷ Under Alternatives 2 through 4, this figure represents the number of other trap/pot vessels that would be newly subject to SAM requirements. Under Alternatives 5, 6 Draft*, and 6 Final (Preferred), this figure also includes the change in the number of vessels subject to SAM requirements as a result of changes in the SAM zone's boundaries.							
⁸ Until 12 months after publication of the final rule, Alternatives 2 through 4 would require that buoy lines be made entirely of non-floating line. Under Alternatives 5, 6 Draft*, and 6 Final (Preferred), vessels would be allowed to use floating line in the bottom third of the buoy line. Under Alternatives 5, 6 Draft*, and 6 Final (Preferred), this figure represents the net change in the fathoms of buoy line converted, including both increases and decreases in buoy line converted as a result of changes in the SAM zone's boundaries.							
⁹ Under Alternatives 2 through 4, the DAM program and all gear requirements unique to this program would be eliminated 12 months after publication of the final rule. Under Alternatives 5, 6 Draft*, and 6 Final (Preferred), the program would be eliminated six months after publication of the final rule.							
¹⁰ This indicator is designed to capture seasonal differences in the application of regulations under each alternative, and is calculated by multiplying the square nautical miles of area protected under the ALWTRP by the number of days each year that seasonal gear modification requirements would apply.							

With respect to most other indicators, the impacts of Alternative 6 Final (Preferred) are similar to those of Alternatives 2, 3*, 4, and 6 Draft*. The most notable exception is the number of "area-days" for which broad-based gear modification requirements would be in effect. This indicator is designed to capture seasonal differences in the application of regulations under each alternative, and is calculated by multiplying the square nautical miles of area protected under the ALWTRP by the number of days each year that seasonal gear modification requirements would apply. By this measure, Alternative 2 would provide the highest degree of protection (an estimated 92 to 93 million area-days subject to broad-based gear modification requirements), followed by Alternative 4 (79 million area-days) and Alternatives 3*, 5, 6 Draft*, and 6 Final (Preferred), with approximately 65 million area-days each. As noted in the DEIS, however, the actual risk-reduction potential of these alternatives is unlikely to vary as much as this indicator implies. The seasonal exemptions provided under Alternatives 3*, 4, 6 Draft*, and 6 Final (Preferred) are premised on the migratory patterns of whales. Current understanding of these patterns suggests that the risk of entanglement for a whale in the Mid-Atlantic or Southeast during the summer months (June through August) is low. As a result, year-round requirements in the Mid-Atlantic or Southeast would likely offer little additional risk reduction relative to seasonal standards.

8.2 ECONOMIC IMPACTS

This section summarizes the costs of complying with the requirements under each of the ALWTRP regulatory alternatives, reviewing both average vessel compliance and industry-wide compliance costs

8.2.1 Estimated Vessel Compliance Costs

The economic impact analysis first calculates the compliance costs for model vessels, defined by species sought and fishing location. Estimated vessel compliance costs include both the expenses associated with reconfiguring gear as required under the new ALWTRP regulations and the costs (or savings, for some vessel groups) associated with replacing gear more (or less) frequently due to gear loss.

The cost associated with converting trap/pot and gillnet gear to comply with the ALWTRP modifications includes the labor and material costs associated with weak links, groundline, gear marking, buoy line, and anchoring modifications. Annualized costs are derived from estimates of the initial investment fishermen incur to convert their gear before the regulations come into effect, as well as ongoing costs thereafter. A seven percent discount rate is used to annualize costs. Appendix 6-C provides a detailed discussion of the individual parameters used in estimating gear conversion costs.

In addition, certain ALWTRP gear modifications could affect gear loss. The analysis assumes that vessels converting from floating groundline and buoy line to sinking and/or neutrally buoyant line, as well as vessels using only one buoy line, would lose an additional five to ten percent of their gear each year. In contrast, the analysis anticipates that vessels currently

subject to SAM area regulations would lose less gear due to a change in regulations that would permit them to use a second buoy line on trawls or strings and convert one-third of non-floating buoy line to floating line.

8.2.2 Total Industry Compliance Costs

Once compliance costs for the model vessels are calculated, the analysis estimates the number of vessels represented by each model vessel (i.e., the number of vessels within a particular category). The analysis uses data on Federal and state-permitted vessels to estimate the number of vessels in each category, identifying vessels that have actively fished with the applicable gear types and might therefore be affected by changes to the ALWTRP. After identifying and removing vessels that operate within exempt waters, each of the remaining vessels is assigned to the appropriate model vessel category.

The product of the annualized compliance cost estimate for each model vessel and the number of affected vessels in each category provides an estimate of annualized compliance costs for the category as a whole. The sum of compliance costs across all vessel categories provides an estimate of annualized compliance costs for the commercial fishing industry.

8.2.3 Economic Impact Results

Exhibit 8-2 summarizes estimated industry compliance costs for each of the regulatory alternatives, breaking the results down by fishing sector (lobster, other trap/pot, and gillnet). As shown, the incremental costs that would be imposed on the fishing industry are estimated to equal approximately \$19.2 million per year under Alternatives 2, 3*, 4, and 6 Draft*. Under Alternative 6 Final (Preferred), incremental costs are estimated to be roughly \$13.4 million per year. The impact of the new standards on lobster vessels would account for over 90 percent of these costs.

Aside from Alternative 1 (No Action), the regulatory alternative that differs most significantly from the others with respect to estimated economic impacts is Alternative 5. The analysis suggests that this alternative would impose incremental regulatory costs of approximately \$1.3 million annually. The costs are lower because Alternative 5 would not impose as broad a set of gear modification requirements, but would instead modify the SAM zone and focus primarily upon the regulation of vessels fishing in that zone.

Exhibit 8-2

ESTIMATED INCREASE IN ANNUALIZED ALWTRP COMPLIANCE COSTS

Economic Impact	Regulatory Alternative	Lobster Trap/Pot Vessels	Other Trap/Pot Vessels	Gillnet Vessels	Total
Average Increase in Annualized Compliance Costs For Vessels Affected by Changes in ALWTRP Regulations	Alternative 1 (No Action)	\$0	\$0	\$0	N.A.
	Alternative 2	\$4,900	\$1,100	\$800	N.A.
	Alternative 3*	\$4,900	\$1,100	\$800	N.A.
	Alternative 4	\$4,900	\$1,100	\$800	N.A.
	Alternative 5	\$300	\$200	\$200	N.A.
	Alternative 6 Draft*	\$4,900	\$1,100	\$800	N.A.
	Alternative 6 Final (Preferred)	\$4,300	\$900	\$700	N.A.
Number of Vessels Affected by Changes in ALWTRP Regulations	Alternative 1 (No Action)	0	0	0	0
	Alternative 2	3,686	418	1,044	5,148
	Alternative 3*	3,678	416	1,024	5,118
	Alternative 4	3,686	418	1,035	5,139
	Alternative 5	3,678	416	1,024	5,118
	Alternative 6 Draft*	3,678	416	1,024	5,118
	Alternative 6 Final (Preferred)	2,889	431	1,033	4,353
Total Increase in Annualized Compliance Costs for Vessels Affected by Changes in ALWTRP Regulations	Alternative 1 (No Action)	\$0	\$0	\$0	\$0
	Alternative 2	\$17,939,000	\$448,900	\$844,500	\$19,232,400
	Alternative 3*	\$17,894,600	\$453,500	\$835,100	\$19,183,200
	Alternative 4	\$17,939,000	\$448,900	\$842,900	\$19,230,800
	Alternative 5	\$1,001,700	\$91,300	\$178,500	\$1,271,400
	Alternative 6 Draft*	\$17,906,300	\$453,800	\$835,600	\$19,195,600
	Alternative 6 Final (Preferred)	\$12,288,000	\$393,000	\$717,300	\$13,398,300

Key:

* = Specified as a Preferred Alternative in the DEIS

Note: Totals may not sum due to rounding.

8.3 SOCIAL IMPACTS

The analysis of social impacts considers how compliance with the regulatory alternatives could affect the socioeconomic viability of fishing, fishermen's quality of life, and the economic welfare of the general public.

8.3.1 Potentially Affected Communities

The social impact analysis first uses county-level data on affected fishing vessels to identify the communities at greatest risk of experiencing adverse social impacts stemming from the ALWTRP modifications under consideration. The analysis uses additional county-level socioeconomic data to characterize key features of the at-risk communities, examining economic, demographic, and social features that may influence the impact of the regulations on the region.

The analysis defines at-risk counties as those with over 100 active vessels that must comply with ALWTRP requirements and which report annual landings of greater than two million pounds by vessels using gear potentially subject to regulation under the ALWTRP. Based on these criteria, Exhibit 8-3 lists the at-risk counties. The list is heavily weighted toward the Northeast, particularly several coastal counties in Maine where lobstering is prevalent. Although the dealer and processing sectors are small to medium in size in these areas, they are frequently part of small communities and play an important role in regional economies in the state. Several of the Maine counties are rural and have limited economic diversification and/or higher than average unemployment and poverty rates. Other at-risk communities include urbanized ports (e.g., Gloucester, Portland, and New Bedford) where fishing activities are linked to major processing operations.

8.3.2 Comparison of Vessel Compliance Costs to Ex-Vessel Revenues

To further examine the potential for socioeconomic impacts from the revised ALWTRP requirements, this analysis considers the economic burden placed on different classes of vessels. Placing vessel compliance costs in the context of typical ex-vessel revenues helps determine whether the costs will be significant enough to cause behavioral changes (e.g., vessel retirement) on the part of vessel operators. The analysis defines "heavily affected" vessels as those for which annualized compliance costs exceed 15 percent of mean annual revenues. The analysis further defines "at risk" vessels as those for which annualized compliance costs are between 5 and 15 percent of mean annual revenue.

Exhibit 8-3		
KEY COMMUNITIES AFFECTED BY ALWTRP MODIFICATIONS		
At-Risk County¹	State	Major Ports²
Washington	ME	Beals Island and Jonesport, Cutler, Eastport, Lubec
Hancock	ME	Stonington/Deer Isle
Knox	ME	Rockland, Vinalhaven
Lincoln	ME	South Bristol, Boothbay Harbor
Cumberland	ME	Portland, Harpswell
York	ME	Kennebunkport/Cape Porpoise
Rockingham	NH	Hampton/Seabrook, Portsmouth, Isles of Shoals
Essex	MA	Gloucester, Rockport, Marblehead
Plymouth	MA	Plymouth, Scituate
Barnstable	MA	Sandwich, Hyannis, Chatham, Provincetown
Bristol	MA	New Bedford, Fairhaven, Westport
Washington	RI	Point Judith/Galilee
Newport	RI	Jamestown, Newport, Tiverton, Sakonnet Point
Suffolk	NY	Hampton Bays, Montauk, Greenport
Ocean	NJ	Point Pleasant, Long Beach/Barnegat Light
Notes:		
¹ For this analysis, at-risk counties are defined as those with over 100 active vessels that must comply with ALWTRP requirements and which report annual landings of greater than two million pounds by vessels using gear potentially subject to regulation under the ALWTRP. This list is heavily weighted toward the Northeast, particularly several coastal counties in Maine where lobstering is prevalent.		
² Major ports based on Hall-Arber et al. (2001) and McCay and Cieri (2000).		

A comparison of annualized vessel compliance costs to vessel revenue suggests that a limited subset of vessel operators are likely to face costs significant enough to drive them out of business under Alternative 6 Final (Preferred). Although uncertainties exist in the analysis, the vessels categorized as heavily affected seem to be few in number (relative to the full set of ALWTRP vessels) and small in size. Therefore, they employ a relatively small number of fishermen and account for a relatively small share of landings. Hence, effects on dealers and processors are likely to be minor. Under Alternative 6 Final (Preferred), numerous other vessels (approximately 1,980) fall in the at-risk vessel category (for which annualized costs represent 5 to 15 percent of mean annual revenues). The at-risk vessels are dominated by Class II lobster vessels; of these, the most affected subsets are vessels in Maine, which are estimated to have greater gear loss costs.

Under Alternatives 2, 3*, 4, and 6 Draft*, the analysis identifies a much larger number of heavily affected vessels than under Alternative 6 Final (Preferred). Most notably, numerous Class II lobster vessels fishing Maine inshore waters have cost-revenue ratios that exceed the 15 percent threshold. In general, the greater number of heavily affected vessels under these alternatives is attributable to slightly higher per-vessel compliance costs as well as to the application of an exemption line that would make approximately 50 percent of Maine state waters subject to ALWTRP requirements, as opposed to 29 percent under Alternative 6 Final (Preferred). Analysis of Alternative 5 (the modified SAM) shows very few vessels would face compliance costs that qualify them as heavily affected.

For all the alternatives, it is difficult to discern precisely how the operators of heavily affected vessels will respond to the regulations. The assumption that all heavily affected vessels will cease fishing is highly conservative, and fishermen identified as heavily affected might find it economically possible to adjust to the modified ALWTRP regulations (e.g., by restricting their effort to exempted waters) rather than leave fishing. Furthermore, the groundline buyback programs currently underway will help to defray some gear conversion costs and may help some vessels continue to operate.

8.3.3 Other Socioeconomic Impacts

Other negative and positive socioeconomic impacts may occur as the result of the implementation of ALWTRP modifications. These impacts are discussed in sections 8.3.3.1 and 8.3.3.2, respectively.

8.3.3.1 Negative Impacts

Fishermen may realize a variety of other negative social impacts in complying with ALWTRP modifications:

- To avoid the requirements associated with the new ALWTRP regulations, fishermen may choose to fish increasingly in exempted waters. This could cause congestion, gear conflicts, and competition for fishing grounds in exempted waters to increase.
- Furthermore, revised ALWTRP gear modification requirements may result in an increased incidence of gear loss. In addition to the costs incurred to replace lost gear, fishermen may spend more time and resources hauling, grappling for, and repairing gear. This could potentially increase the hours that fishermen spend at sea.
- Likewise, certain aspects of the ALWTRP modifications may have safety implications for fishermen. For example, sinking and/or neutrally buoyant groundline is more likely to snag on hard bottom and marine debris, and hauling snagged gear could be dangerous.
- Finally, the compliance cost burden may create a competitive disadvantage for smaller lobster vessels, causing industry consolidation.

8.3.3.2 Positive Impacts

Changes to the ALWTRP may also have a variety of positive social impacts. First, fishermen may experience safety benefits:

- Alternatives 2 through 6 Final (Preferred) include the elimination of the DAM program six to 12 months after publication of the final rule (depending on the alternative). Industry advocates have asserted that DAM provisions can be burdensome, requiring unanticipated gear removals that can cause safety issues in times of bad weather.
- Alternatives 2 through 6 Final (Preferred) call for the elimination of SAM rules that currently limit fishermen to one buoy line per trawl or string. The addition of a second buoy line may help avoid gear conflicts and reduce gear loss, grappling, and associated safety issues.

Second, to the extent that the new ALWTRP regulations successfully protect and restore whale populations, members of the public who view and photograph whales would benefit from the regulations. Annual revenues from the New England whale watching industry total approximately \$30 million, and studies indicate that consumers' enjoyment increases with the number of whales and species sighted. Consequently, whale watch operators could benefit from increased ridership and revenues as whale populations stabilize or increase.

Economic research indicates that society places a value on the knowledge that unique environmental resources exist, even without using the resource directly (often referred to as the "existence value" of a resource). Therefore, the preservation of right, humpback, fin, and minke whales would have an existence value that is not explicitly quantified in this EIS.

The biological impacts analysis suggests that whale protection would be greatest under Alternative 2, slightly less under Alternatives 3*, 4, 6 Draft*, and 6 Final (Preferred) (due to seasonal exemptions), and significantly less under Alternative 5. The benefit that the general public would derive from whale conservation under the alternatives analyzed would likely follow a similar pattern.

8.3.4 Social Impacts Summary

Exhibit 8-4 summarizes the social impact conclusions discussed above.

8.4 INTEGRATION OF IMPACT ANALYSIS FINDINGS

Integration of the biological, economic, and social impact findings allows for a meaningful comparison of the regulatory alternatives. Integrating these findings typically allows formulation of measures that characterize the benefits derived relative to the costs (or other negative effects) incurred. However, in the case of the ALWTRP modifications, development of a unifying cost-benefit analysis is complicated by two factors:

Exhibit 8-4

SUMMARY OF SOCIOECONOMIC IMPACTS BY ALTERNATIVE

Parameter	Alternative 1 (No Action)	Alternative 2	Alternative 3*	Alternative 4	Alternative 5	Alternative 6 Draft*	Alternative 6 Final (Preferred)
Number of Heavily Affected Vessels	0	952	952	952	1	952	173
Total Employment on Heavily Affected Vessels	0	1,904	1,904	1,904	2	1,904	304
Impacts on Dealers	None	- Short term supply disruptions possible	- Short term supply disruptions possible	- Short term supply disruptions possible	- Minor	- Short term supply disruptions possible	- Minor
Impacts on Processors	None	- Short term supply disruptions possible	- Short term supply disruptions possible	- Short term supply disruptions possible	- Minor	- Short term supply disruptions possible	- Minor
Other Potential Negative Social Impacts	None	- Competition for fishing grounds in exempted waters - Safety and time implications of gear loss - Burden greatest on small vessels; potential industry consolidation	- Competition for fishing grounds in exempted waters - Safety and time implications of gear loss - Burden greatest on small vessels; potential industry consolidation	- Competition for fishing grounds in exempted waters - Safety and time implications of gear loss - Burden greatest on small vessels; potential industry consolidation	- Minor	- Competition for fishing grounds in exempted waters - Safety and time implications of gear loss - Burden greatest on small vessels; potential industry consolidation	- Competition for fishing grounds in exempted waters - Safety and time implications of gear loss - Burden greatest on small vessels; potential industry consolidation

Exhibit 8-4

SUMMARY OF SOCIOECONOMIC IMPACTS BY ALTERNATIVE

Parameter	Alternative 1 (No Action)	Alternative 2	Alternative 3*	Alternative 4	Alternative 5	Alternative 6 Draft*	Alternative 6 Final (Preferred)
Positive Social Impacts	None	<ul style="list-style-type: none"> - Removal of DAM program may increase safety and make requirements more predictable - Public welfare benefits of increased whale protection (greatest benefit relative to other alternatives) 	<ul style="list-style-type: none"> - Removal of DAM program may increase safety and make requirements more predictable - Public welfare benefits of increased whale protection (slightly lesser benefit relative to Alternative 2) 	<ul style="list-style-type: none"> - Removal of DAM program may increase safety and make requirements more predictable - Public welfare benefits of increased whale protection (slightly lesser benefit relative to Alternative 2) 	<ul style="list-style-type: none"> - Removal of DAM program may increase safety and make requirements more predictable - Public welfare benefits of increased whale protection (significantly lesser benefit relative to Alternative 2) 	<ul style="list-style-type: none"> - Removal of DAM program may increase safety and make requirements more predictable - Public welfare benefits of increased whale protection (slightly lesser benefit relative to Alternative 2) 	<ul style="list-style-type: none"> - Removal of DAM program may increase safety and make requirements more predictable - Public welfare benefits of increased whale protection (slightly lesser benefit relative to Alternative 6 Draft*)

Key:

* = Specified as a Preferred Alternative in the DEIS

- First, the costs and benefits are characterized using diverse metrics (e.g., dollars, increased use of low-risk gear, numbers of heavily affected vessels) that cannot be readily reduced to a single measure. In many cases, costs or benefits are described only in qualitative terms, or are characterized with imperfect indicators (e.g., comparative measures of risk reduction potential).
- Second, as acknowledged above, several of the regulatory alternatives – particularly Alternatives 2, 3*, 4, and 6 Draft* – have very similar implications. Because the impact estimates are subject to uncertainty, the minor variations that exist between these alternatives do not allow easy differentiation.

Differentiating among the alternatives therefore requires careful, critical consideration of the cost and benefit estimates developed. Because it would require year-round use of low-risk gear along the entire Atlantic coast, Alternative 2 clearly is the most conservative, risk-averse approach to the protection of endangered whales. However, the seasonal exemptions provided under Alternatives 3*, 4, 6 Draft*, and 6 Final (Preferred) are premised on the movement of whales. Therefore, the residual potential for entanglement of whales in Mid-Atlantic or South Atlantic waters during summer months is minor; i.e., year-round requirements are likely to offer little additional risk reduction benefit.

Furthermore, close examination of the compliance cost estimates suggests that the costs associated with the seasonal implementation of gear conversion requirements may be over-estimated. The analysis posits that fishermen will convert gear even if the requirements only apply in certain months, a very conservative assumption. According to comments provided by fishermen during the scoping process, many fishermen in the Mid- and South Atlantic use separate sets of gear to target different species at different times of year. If conversion of only winter gear is required, compliance costs will be less than those estimated. In addition, some of the fishermen in the Mid-Atlantic and South Atlantic areas may choose to confine their fishing effort to months when the requirements are not in effect, avoiding the regulation completely. Such behavior would reduce the cost of complying with Alternatives 3*, 4, 6 Draft*, and 6 Final (Preferred) without increasing risk to whales.

Based on consideration of the relative costs and benefits of the alternatives, NMFS initially identified two preferred alternatives in the DEIS: Alternative 3* and Alternative 6 Draft*. The DEIS rationale emphasized that these alternatives offered the flexibility of seasonal restrictions for both the Mid- and South Atlantic regions, potentially allowing fishermen to pursue lower-cost compliance strategies. The risk-reduction tradeoff was seen as minimal, given that entanglement risk in the Mid- and South Atlantic is low in the summer months (due to whale migratory patterns). Alternative 6 Draft* offered the added protection of temporarily expanding the SAM zone; while the SAM requirements would eventually be eliminated, they would remain in effect until the broad-based gear modifications are fully implemented.

Comments on the DEIS have guided NMFS' development of a final preferred alternative: Alternative 6 Final (Preferred). This alternative integrates minor changes to Alternative 6 Draft* that reduce the economic impact of the rule while sacrificing few, if any, large whale protection benefits.

- Alternative 6 Final (Preferred) would expand exempted areas in Maine and Long Island Sound, basing this decision on whale sightings data that indicate areas used infrequently by whales.
- NMFS received numerous comments opposing the gear marking scheme proposed in several of the alternatives. Rather than marking buoy lines every ten fathoms, Alternative 6 Final (Preferred) calls for one mark midway on the buoy line in the water column. Many groups considered the original proposal impractical and potentially costly.
- Alternative 6 Final (Preferred) would offer additional flexibility on the specific configuration of gillnet weak links. Fishermen, scientists, and other reviewers suggested an alternative weak link placement that NMFS believes will prove equally effective while reducing compliance costs.
- Gillnetters fishing within 300 yards of shore in North Carolina expressed safety concerns related to the proposed anchoring requirements involving 22-pound Danforth-style anchors. Thus, Alternative 6 Final (Preferred) would allow the holding power of at least an eight-pound Danforth-style anchor on the offshore end and 31-pound dead weights on the inshore end, in combination with 600-pound (rather than 1,100-pound) weak links. These changes would offer a similar level of protection for large whales and may also benefit smaller protected species (due to the lower breaking strength).
- Alternative 6 Final (Preferred) would grant an exemption to gillnet panel weak link and anchoring requirements to vessels fishing at depths greater than 280 fathoms. Whales are not likely to occur in waters of this depth; hence, this change would not compromise the protectiveness of the rule. Furthermore, NMFS has not tested the operational feasibility of using weak links in gillnets set at such depths.