

Assessment Model, Terminal Year	Description of Assessment Model	Overfishing?/ Overfished?	In Rebuilding Program?	OFL	ABC/ABC CR	ACL	ACT
Combined CASA model, 2015	A statistical length based model. Separate analyses for GB open, GB closed and Mid-Atlantic and results combined to assess the entire stock.	No	No	30,419 mt for 2014, 38,061 mt in 2015, 68,418 mt in 2016, 75,485 mt in 2017	ABC= Catch associated with fishing rate that has 25% chance of exceeding OFL 26,240 mt for 2014, 31,459 mt in 2015 and 55,737 mt in 2016, 61,741 mt in 2017 (including discards)	ABC- Discards 20,782 mt for 2014, 25,352 in 2015, 37,852 mt in 2016, 46,737 mt in 2017 (after discards removed)	Maximum that ACT for LA fishery can be is set at catch associated with an F rate with 25% of exceeding ABC, actual targets often set lower
Adjustment of the access area boundaries to protect small scallops and re-allocation of access trips when an area's biomass proves to be less than expected are ongoing challenges addressed in each framework action.				MSY/OY	AMs	Discards	State Waters
				MSY = 23,798 mt, B <sub>MSY</sub> = 96,480 mt	Proactive AMs- Setting fishery targets below the catch limits. Reactive AMs - future reductions in allocations equivalent to any overage depending on the impact overage had on fishing mortality.	5,458 mt for 2014, 6,107 mt estimated for 2015, 17,885 mt estimated for 2016, 15,004 estimated for 2017	Not included in the FMP
Availability of Biological and Assessment Data		Used in Assessment: Federal scallop dredge survey as well as indexes from: additional dredge survey (VIMS); towed digital camera survey (Habcam video survey); and video drop camera survey (SMAST).  Other Data: commercial catch, LPUE, commercial shell height compositions, data from dredge surveys conducted by VIMS, growth increment data from scallop shells, and shell height/meat weight data adjusted to take commercial practices and seasonality into account (observer data).					
Recent Performance Against Harvest Control Rule		Stock has remained in rebuilt conditioning with no overfishing occurring in recent years. Landings were 98.3% of ACL in 2011, 90.3% of ACL in 2012, 87.2% of ACL in 2013, 74 % of ACL in 2014 and 66% of ACL in 2015 and 51% of ACL in 2016 fishing year. LA landings were 88.6% of ACT. The ACL is based on total exploitable biomass, while fishery allocations follow spatial management of the resource. In years where exploitable biomass is in closed area, landings as a percentage of the ACL is anticipated to decline.					
Current Management Program		Comprised of open area DAS management and access area trip allocations with possession limits for the Limited Access (LA) Fishery. Annual individual quota allocations combined with possession limits for the LAGC Fishery with IFQ permits, possession limits for the LAGC fishery for vessels holding NGOM and Incidental catch permits. 94.5% of the ACL is allocated to LA fishery, and 5.5% to the LAGC IFQ fishery. Separate TAC for NGOM Management Area.					
Catch, Revenues, and Variability		Landings and revenues increased in 2016 fishing year compared to 2015 levels. Landings were lower, but revenues (in 2016 dollars) were higher than the average values in the last 10 years. Catch in 2016=19,005 mt, 1975-2015 Fishing years - Catch: Min.3,212 mt., Max.28,413 mt, Mean=14,773 mt Median=13,104 mt. Landed lb. 2016 Fishing year=41.9 mill.lb., Last 10 fishing years (2007-2016): Avg. 49.7 mill.lb. Min.32.6 mill.lb. Max.61 mill.lb. Revenue (in 2016 dollars): 2016 Fishing year= \$499 million, Last 10 fishing years (2007-2016): Average= \$485 mill., Min.= \$405 mill., Max=\$ 621 mill.					
Data - Vessels, Permits, Dealers, Processors, Employment		347 LA permit holders including 313 FT, 34 PT vessels, all active. 225 LAGC-IFQ, 77 NGOM and 135 incidental catch unique permits in 2016 fishing year excluding LA vessels. In 2016, only 124 of the vessels in the LAGC-IFQ fishery were active (i.e., landed scallops). About 508 crew positions in the LAGC-IFQ fishery employed by active vessels with IFQ permits only and about 2351 crew position in the LA fishery in 2015.					
% Food, % Recreational		About 100% Food, recreational fishing is not common due to the gear involved and distribution of stock offshore.					
Fishing Communities		Fishing activity by port and communities are widely distributed ranging from state of ME to NC. In 2016 fishing year, MA ports had the highest scallops landings, followed by NJ and VA. Factors that influence prices and revenues, and geographical distribution of scallop resource, differences in abundance and access area allocations by area would also have impacts on the fishing activity and incomes of the fishing communities.					
Other Economic/Social Factors		Economic factors that impact prices, revenues, profits and crew shares in the scallop fishery include the size composition of landings, demand for scallops in the domestic and export markets, import prices and to a some extent, the level of scallop landings. According to price model estimates, price flexibility is low because holding all other factors constant, a 1% increase in landings net of exports would reduce price by only 0.3%. Short-term fluctuations in landings due to area and season closures and effort reduction measures also affect prices, revenues, profits and crew shares. The price premiums for the larger size scallops including U10s and U12s increased in the recent years as US has become of the major exporters of large scallops. Recently, in 2017 scallop prices declined as landings and the proportion of large size U10 scallops increased, exports and export prices declined.					
Major Sources of Scientific Uncertainty		Highest sources of scientific uncertainty include discard mortality, incidental mortality and stock-recruit relationship. Medium sources of uncertainty are natural mortality, sea scallop growth, maturity and fecundity, density dependence, shell height/meat weight relationship.					
Major Sources of Management Uncertainty		Management uncertainty is due to DAS carry-over, estimate of catch from open areas that are regulated by DAS management, ability to fish unused access area allocation within the first 60 days of the following year and uncertain efficiency due to vessel upgrades and replacements. Management uncertainty is addressed by establishing ACTs which will have an F that has a 25% chance of exceeding ABC.					
How is the probability of overfishing currently addressed?		Uses risk based harvest rules such that ABC is set at an F that has a 25% of chance of exceeding F <sub>max</sub> . This rate is associated with less than 1% loss in yield relative to F <sub>max</sub> . In addition, risk associated with management uncertainty is addressed by setting ACTs for the limited access fleet. Stock assessments and stochastic estimate of Fmax which considers uncertainty in natural mortality, growth, meat yield, selectivity, discard mortality and non-capture mortality.					
What is the consequence of overfishing?		Overfishing could lead to an reduction in overall LPUE and an increase in costs in the short-term and a reduction in scallop stock biomass, yield and net economic benefits over the long-term. However, reactive AMs would be applicable if overfishing is occurring. If the sub-ACL is exceeded, reactive AM would include a reduction in future IFQ for LAGC vessels and a reduction in overall DAS for LA vessels in the subsequent year to account for any overages with the exception that if the overall F estimated after the fishing year has ended is 0.34 or less, no AMS would be triggered. In-season adjustments could also be considered to prevent ACL from reached.					
How are expected net benefits to the Nation currently measured/evaluated?		Expected net benefits to the nation were estimated by the cumulative present value of the (sum of) producer and consumer surpluses (benefits) over the long-term (usually over 15 years) net of status quo benefits using the biological projections for landings, size composition of scallops, projected LPUE, price and cost models.					
Interactions with Other Fisheries/Stocks, Bycatch Issues		Yellowtail flounder and windowpane flounder bycatch is addressed by AMs, time/area closures and gear modification requirements. Sea turtle interactions are addressed by seasonal restrictions and gear modifications to minimize severity of potential impacts.					
Ecosystem Considerations: Trophic Interactions		Predation by cancer crabs and sea stars affect juvenile scallop mortality and sea scallop density. Negative relationship were found between the spatio-temporal abundance of the sea star Astropecten americanus and scallop recruitment. Similarly, scallop density in high density sites has declined due to predation especially by crabs.					
Ecosystem Considerations: Habitat		Impacts on habitat are addressed by effort reduction measures and area closures. The increase in the LPUE due to these measures and area rotation system reduced the area swept by dredge activity considerably. Estimates of area swept corresponding to each alternative is taken into account in the fishery specifications process.					
Ecosystem Considerations: Climate		Increasing ocean acidification could affect the sea scallop seed production negatively. This factor is not incorporated to the assessment at this time.					
Other Important Considerations/Notes		Spatial nature of the fishery and associated risks related to localized overfishing/underutilization. Distributional issues related to accessibility for different permit types and vessels from different ports. Differential impacts of the IFQ program on the participants of the LAGC fishery and the issues related to lease and quota prices.					