Discussion Document 6

Management Units, Common Fishery Characteristics

VTR locations were mapped using the process described in DePiper (2014) and Münch & DePiper (2016). In this method, the self-reported fishing location is transformed into probability-weighted potential fishing grounds with the help of a cumulative distribution function (CDF). The distribution estimates the distance between self-reported logbook locations and observed fishing locations, conditional on observed trip characteristics such as length of trip and gear employed. The statistical relationship is then used to develop confidence intervals (25^{th}, 50^{th}, 75^{th}, and 90^{th}) surrounding each self-reported fishing location, conditional on the trip characteristics and regardless of whether the trip had an observer on board. These confidence intervals are then employed to assess the likely spatial footprint of that trip. Quartiles of revenue, catch, and landings are uniformly allocated to the 4 confidence intervals, in order to more realistically represent the spatial distribution of a trip. This process allows the data to define the spatial resolution of a trip.

1. General Overview of Fishing Activities within the Georges Bank EPU

Figure 1 presents the revenue generated within the Georges Bank EPU, by year. Revenue from scallop dredges have dominated the total revenue in the recent past, although earlier in the time series bottom trawls generated similar levels to scallop dredges. The increase in clam dredge revenue in the last few years is, in part, due to the opening of fishing grounds previously closed due to Paralytic Shellfish Poisoning concerns.

Figure 2 presents the total catch generated within the Georges Bank EPU, again by gear, which paints quite a different picture from the revenue in Figure 2. All catch is reported in live weight. Bottom trawl, midwater trawl, and scallop dredges generate the vast majority of landings on Georges Bank. Figure 4 and Figure 5 make clear that both the revenue and catch are being generated primarily by large vessels.

Figure 6 presents total catch by FMP. Data is grouped by FMP for ease of species classification more than any indication of how management of these fisheries should be structured under EBFM. Herring, large mesh multispecies, and scallop represent the bulk of biomass caught within the Georges Bank EPU in most years.

2. Spatial Distribution of Fishing Activities within the Georges Bank EPU

As illustrated by Figure 1, fishing revenue tends to be concentrated along the boundaries of the Georges Bank EPU. This is particularly true for the northern flank of the Bank, although the exact intensity and distribution of revenue has changed across time. The scallop access areas within the boundaries of CAI, CAII, and Nantucket Lightship are readily identifiable and shift substantial effort/revenue around Georges Bank. The proposed changes to year-round closures on Georges Bank will likely redistribute revenue and fishing effort if ultimately implemented, in a manner not full represented within the historical fishing time series presented.

Figure 7 presents histograms of the percentage of each trip to Georges Bank that is estimated to have fallen within the bounds of the Georges Bank EPU. This figure represents all trips catching any species within each FMP, and thus the categories are not mutually exclusive and a trip can be represented under multiple FMPs. Additionally, the box plots only illustrate trips for which some fraction of the statistical footprint of fishing falls within the Georges Bank EPU. As can be seen, scallop, surf clam/ocean quahog, and HMS trips tend to occur predominantly within the bounds of the Georges Bank EPU, with substantial variability over the remaining FMP trips. Again, this highlights that the EPU as currently defined transects areas of concentrated fishing effort, which could prove problematic for effective management.

The delineation of the Georges Bank management area should consider the substantial effort falling along the current boundaries of the Georges Bank EPU, in order to facilitate correct reporting of catch and landings, enforcement, and other management concerns.

References

DePiper, G. S. (2014). *Statistically Assessing the Precision of Self-reported VTR Fishing Locations.* NOAA Tech Memo NMFS NE 229; 16 p. doi: 10.7289/V53F4MJN

Münch, A., & G. DePiper. (2016). *On the precision of predicting fishing activities and locations.* In Review.

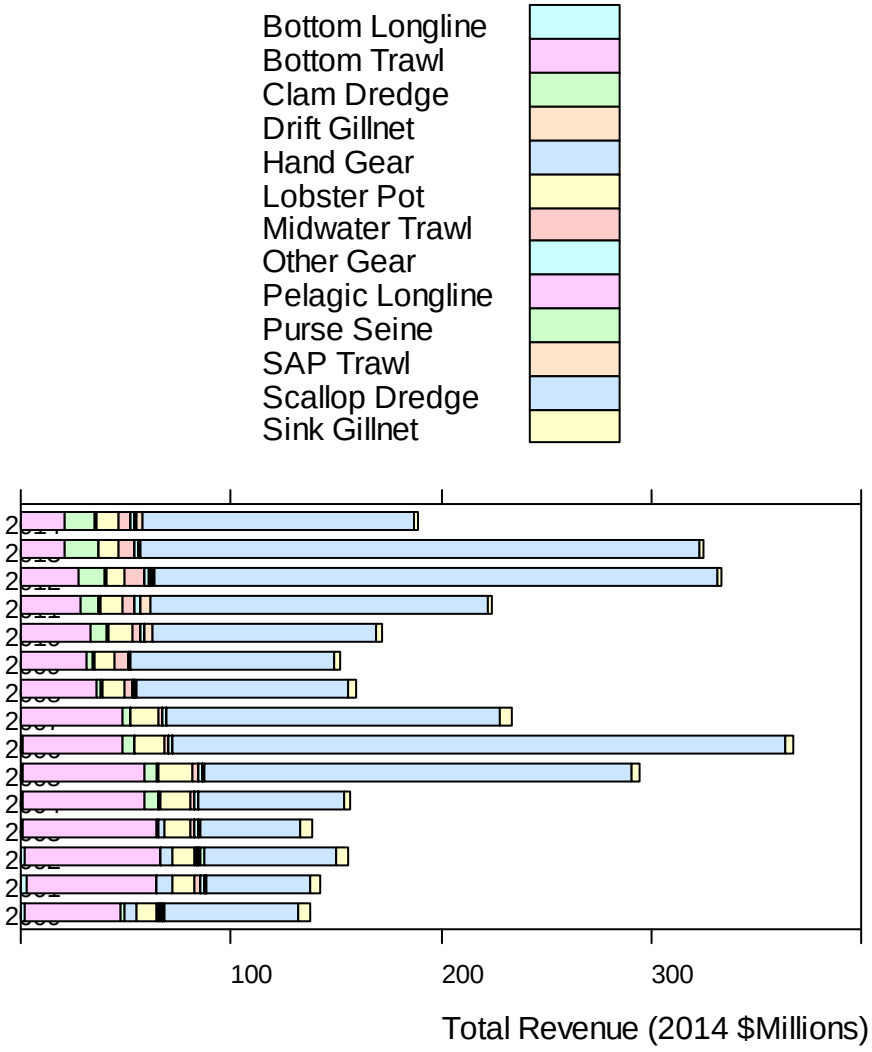

Figure 1. VTR revenue generated within the Georges Bank EPU, by year and gear type.

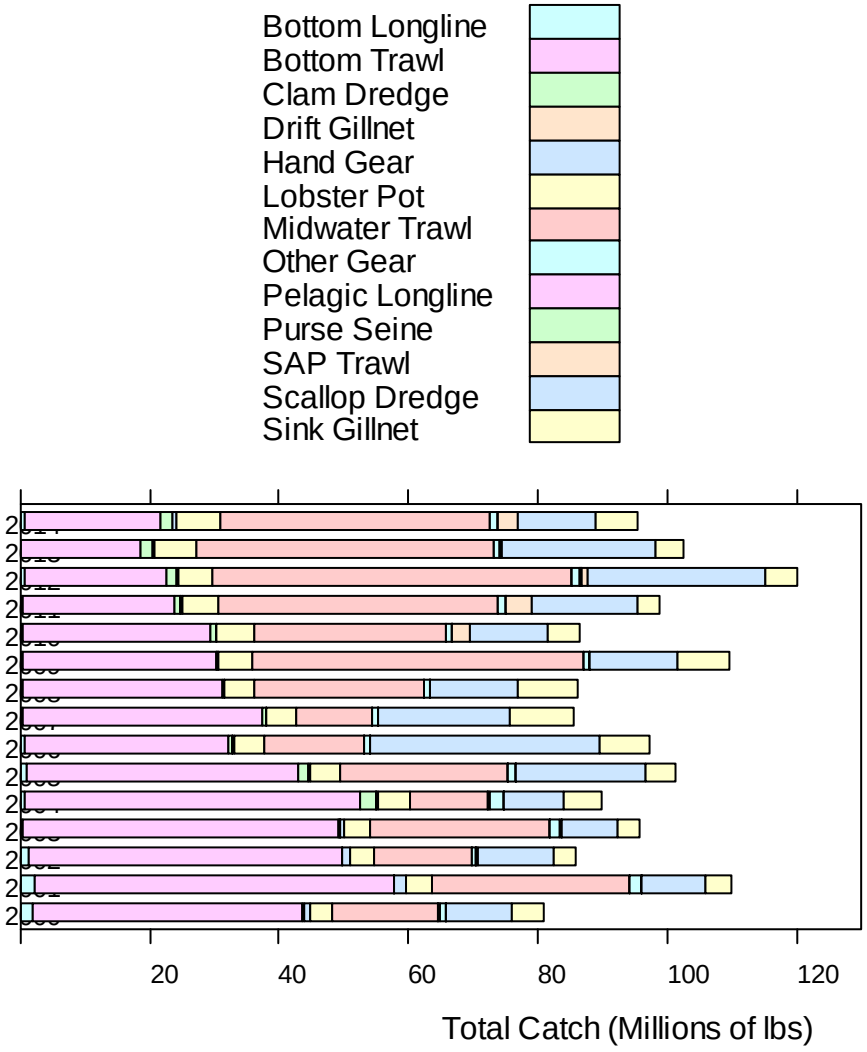

Figure 2. Total catch from the Georges Bank EPU, by gear and year.

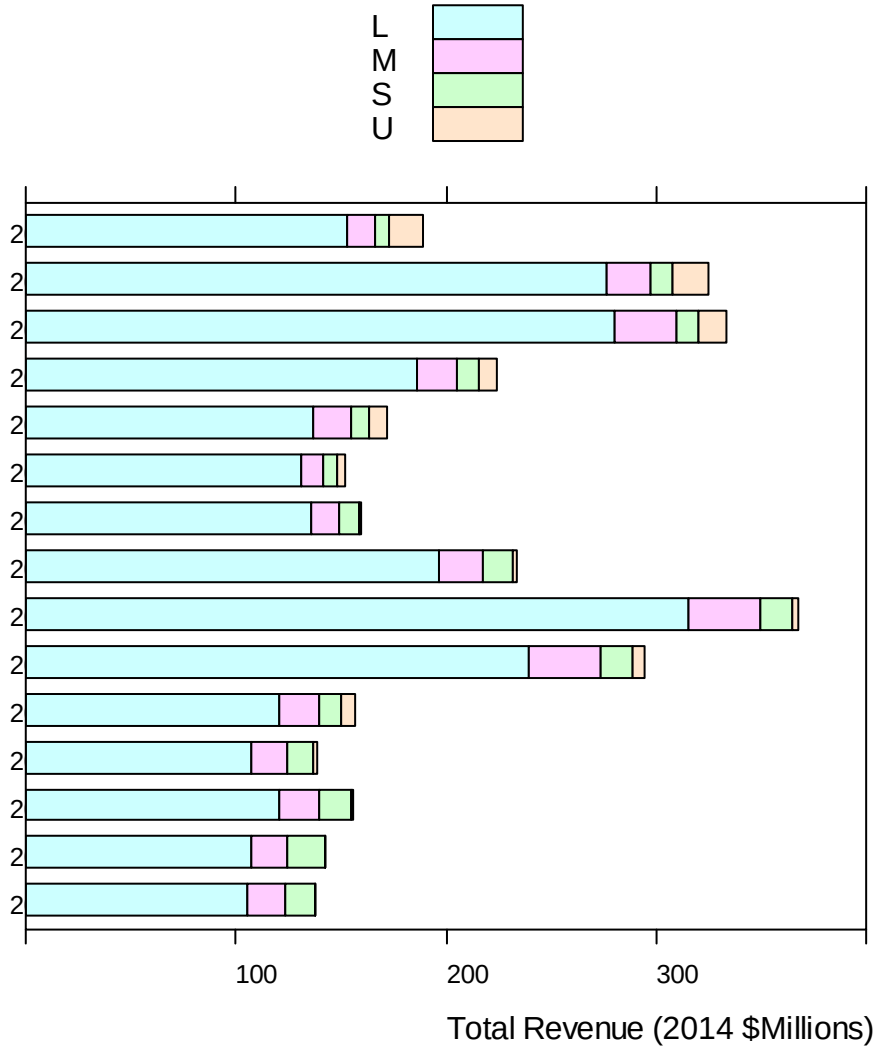

Figure 3. Revenue generated from the Georges Bank EPU, by vessel category. L >= 70 ft, 70 > M >= 50, S < 50, U = Unknown vessel length.

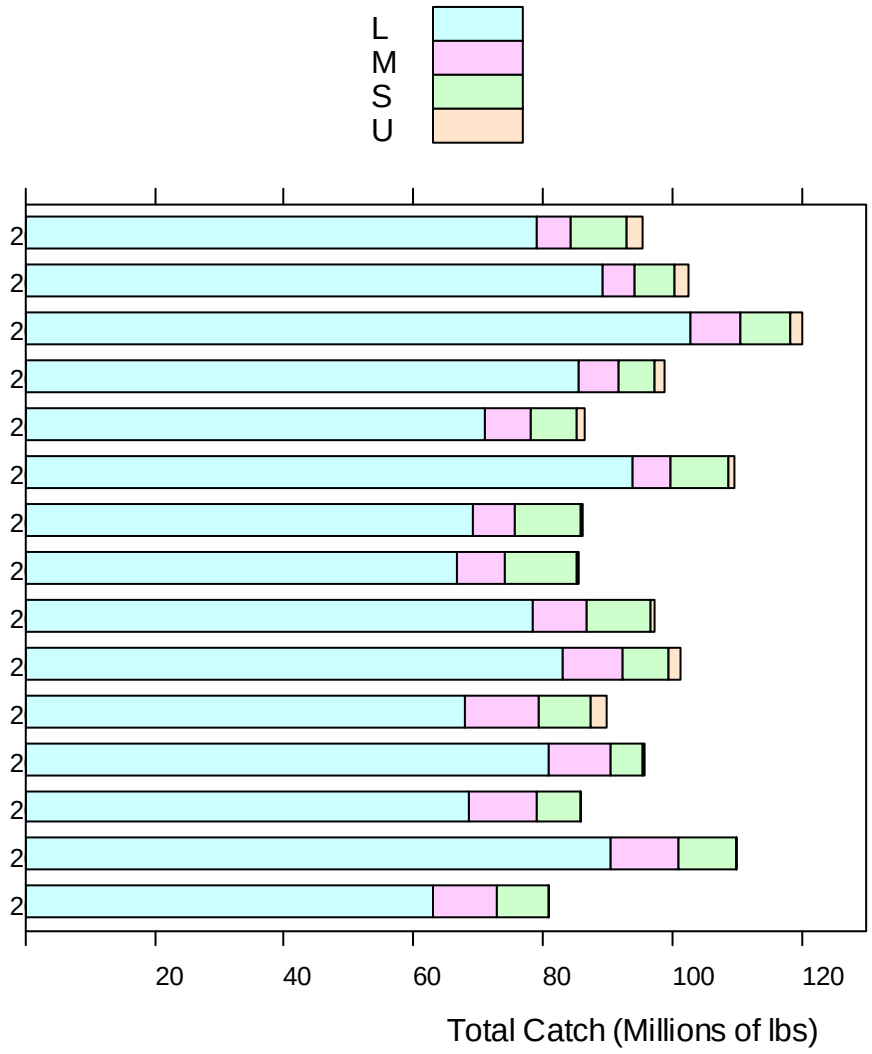

Figure 4. Total catch from the Georges Bank EPU, by vessel category. L >= 70 ft, 70 > M >= 50, S < 50, U = Unknown vessel length.

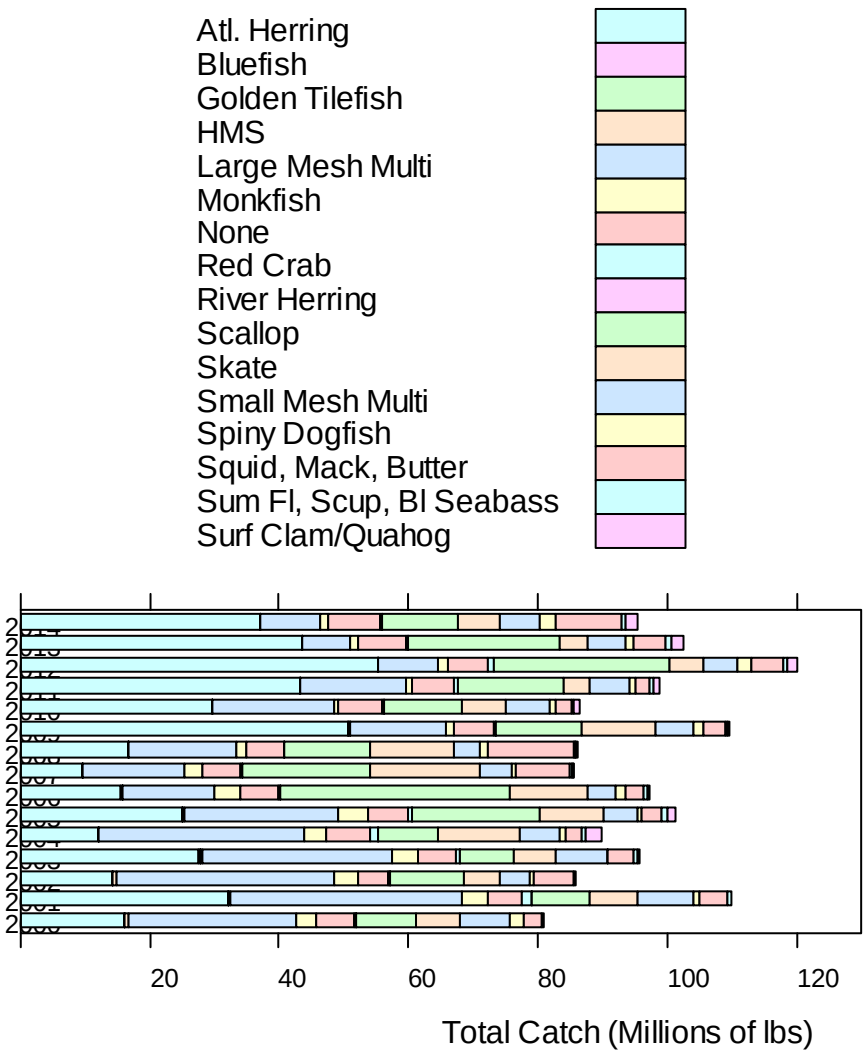

Figure 5. Total catch from the Georges Bank EPU, by FMP.

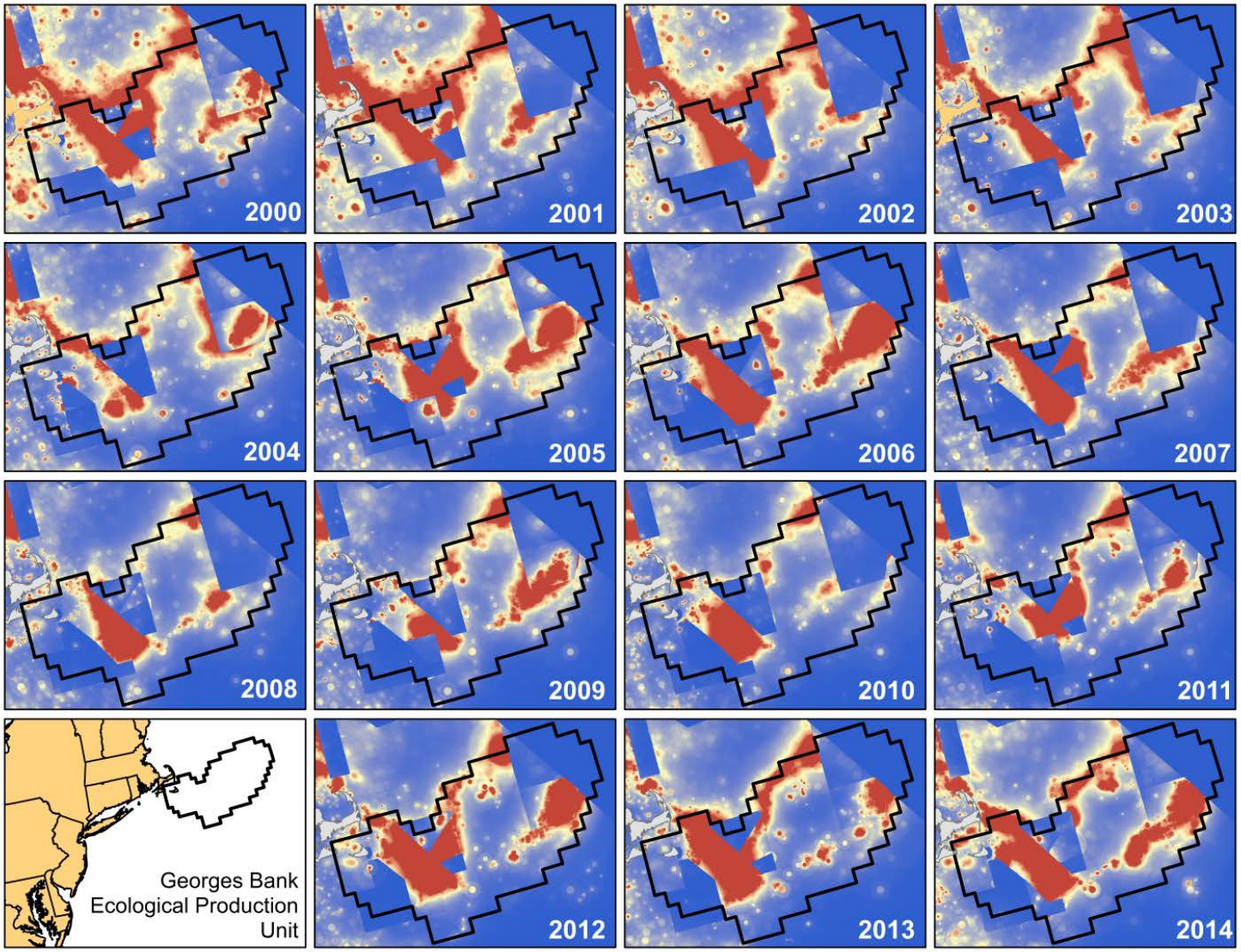

Figure 6. Fishing revenue ($ 2014) generated from the area surrounding the Georges Bank EPU. Blue indicates low revenue, while red indicates the highest revenue intensity. Scale is consistent across years. Map developed by Sharon Benjamin, NEFSC Social Sciences Branch.

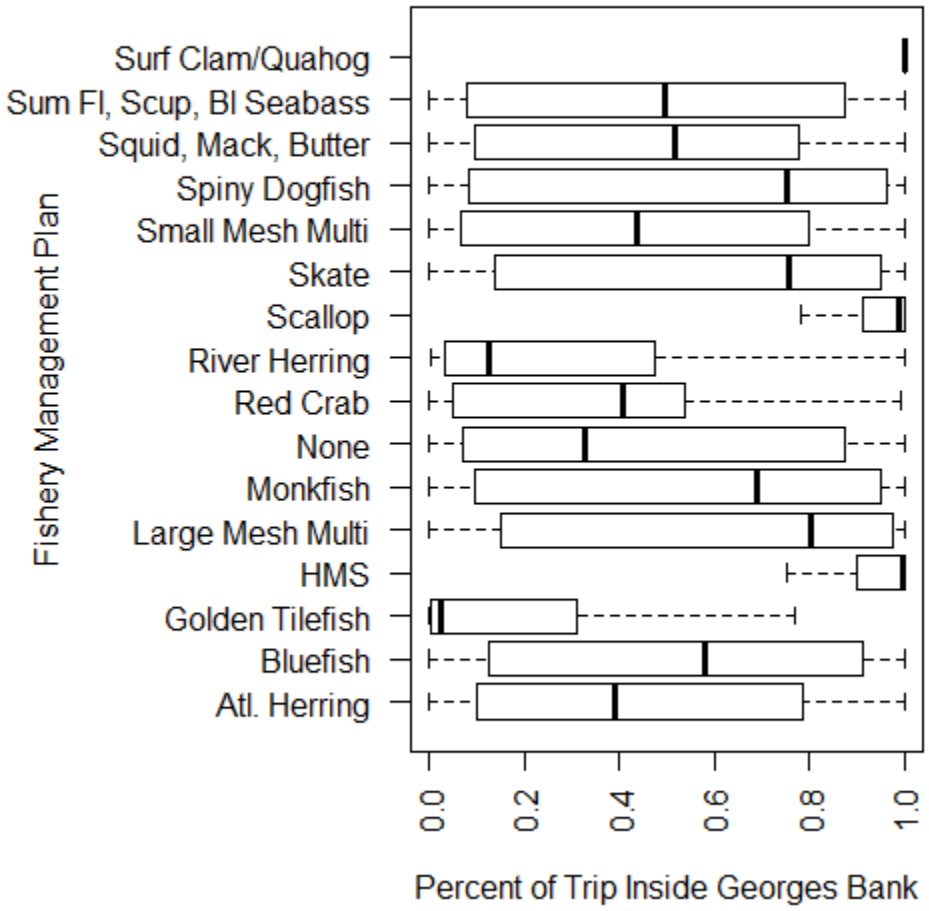

Figure 7. Percent of all trips (2000 – 2014) to Georges Bank calculated to fall within the Georges Bank EPU, by FMP.