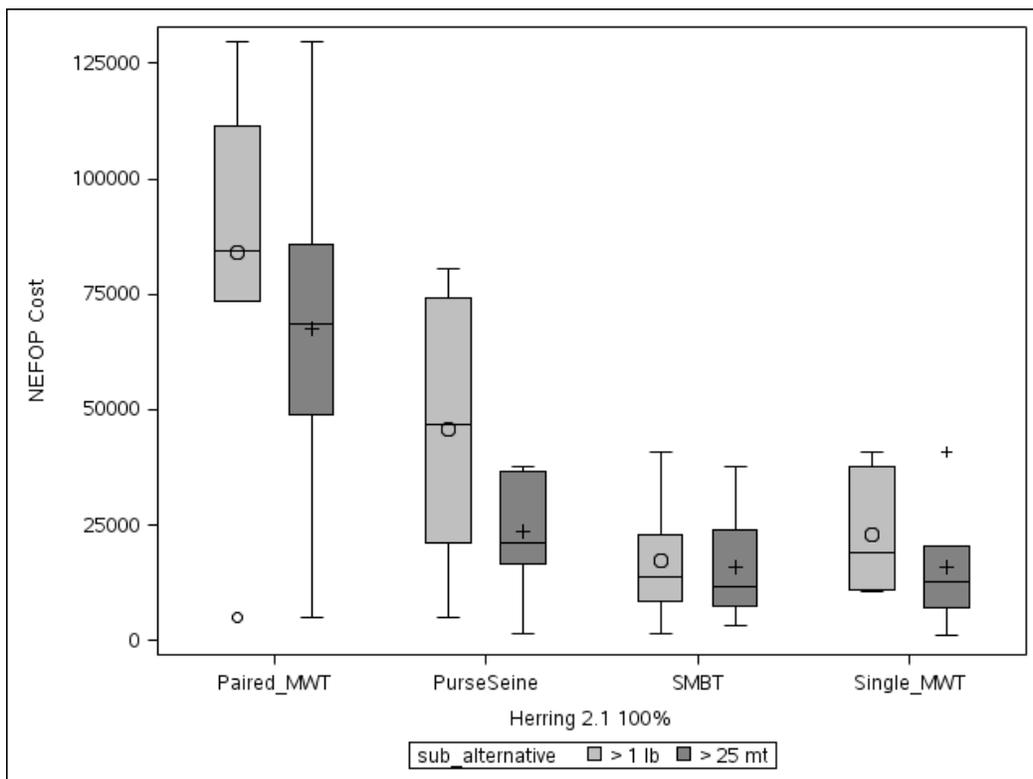


This is probably more information than needed for one table, but I thought it may be easier for us to go through and remove information after reading through this example.

The Committee agreed by consensus that the IFM document should be revised as follows: *Tables (on page 65 of discussion document) regarding return to owner information needs some context to allow the public and Committee members to understand the impacts, particularly the differential impacts for those vessels considered outliers in the data.*

In order to address the Herring Committee's concerns, I have provided one example for context for the economic impact information represented by box and whisker plots in the discussion document. In general, the median and mean are similar for the **annual** monitoring costs, indicating that the data is likely normally distributed in most cases. The data is not skewed and the mean is an appropriate representation of the average costs to the herring fleet. In some cases, there is greater variation between the mean and median, indicating skewness in the data. For these cases, the median is more appropriate to represent the average cost. In addition, the interquartile range is a better representative of the range for the monitoring costs when the spread in data is great. The estimated cost to the industry is provided by fleet. The monitoring cost estimate is separated based on two thresholds for monitoring coverage: (1) vessels landing at least one pound of herring, and (2) vessels landing greater than 25 metric tons of herring. Sub-Option 5 includes a 25 metric ton threshold.

**Figure 1 - Distribution of Monitoring Costs for Herring Alternative 2.1<sup>1</sup>**



<sup>1</sup> Refer to Page 65 of IFM Discussion Document for Herring Alternatives – March 2016

Under Herring Alternative 2.1, there would be 100 percent coverage target for NEFOP-level observers on Category A and B vessels, which includes additional monitoring coverage on the mid-water trawl, small-mesh bottom trawl, and purse seine fleets. Figure 1 shows that the mid-water trawl fleet would pay the highest monitoring cost under Alternative 2.1, followed by the purse seine fleet and small mesh bottom trawl fleet.

For the paired mid-water trawl fleet landing at least one pound of herring or greater than 25 metric tons of herring and subject to monitoring costs, the average monitoring cost is approximately \$85,000 for the paired mid-water trawl fleet if monitoring coverage applies to vessels landing at least one pound of herring. The cost estimates are similar for the two thresholds likely because the paired mid-water trawl fleet generally lands more than 25 metric tons of herring on most trips. Approximately half of those paired mid-water trawl vessels subject to additional monitoring would pay less than \$85,000 in monitoring costs, and approximately half of those paired mid-water trawl vessels subject to additional monitoring would be responsible for more than \$85,000 monitoring costs under Alternative 2.1. Figure 1 shows that the monitoring costs are reduced by approximately \$10,000 on average (mean) for the paired mid-water trawl fleet under sub-option 5 (vessels landings less than 25 metric tons subject to additional monitoring coverage). There is one outlier in the dataset at the lowest end of the data range for the paired mid-water trawl vessels landing at least one pound of herring and subject to additional monitoring. For this reason, the median is closer to the lower end of the cost range compared to the higher end of the cost range.

For the purse seine fleet landing at least one pound of herring and subject to additional monitoring coverage, the average cost is approximately \$50,000. Approximately half of those purse seine vessels would pay less than \$50,000, and approximately half of those purse seine vessels subject to additional monitoring would be responsible for more than \$50,000 but less than approximately \$80,000 for monitoring costs under Alternative 2.1. Figure 1 shows that the monitoring costs are reduced by approximately \$25,000 on average for the purse seine fleet under sub-option 5.

For the small mesh bottom trawl fleet landing at least one pound of herring and subject to additional monitoring coverage, the average cost (median) for monitoring is approximately \$20,000. The median is slightly greater than the mean, indicating a slight skewness in the data; therefore, the median is a better indicator for the average monitoring costs in this instance. Approximately half of those small-mesh bottom trawl vessels would pay less than \$20,000, and approximately half of those small-mesh bottom trawl vessels subject to additional monitoring would pay more than \$20,000 but less than approximately \$80,000 for monitoring costs under Alternative 2.1. Figure 1 shows that the average monitoring costs are only slightly reduced for the small-mesh bottom trawl fleet under sub-option 5.

For the single mid-trawl fleet landing at least one pound of herring and subject to additional monitoring coverage, the average cost for monitoring is slightly less than \$20,000 (median). The median is slightly greater than the mean, indicating a slight skewness in the data; therefore, the median is a better indicator for the average monitoring costs. Approximately half of the single midwater trawl vessels would pay less than \$20,000, and approximately half of those small-mesh bottom trawl vessels subject to additional monitoring would be pay more than \$20,000 but less

than approximately \$40,000 for monitoring costs under Alternative 2.1. Figure 1 shows that the monitoring costs are reduced by approximately \$10,000 on average for the single mid-water trawl fleet under sub-option 5.