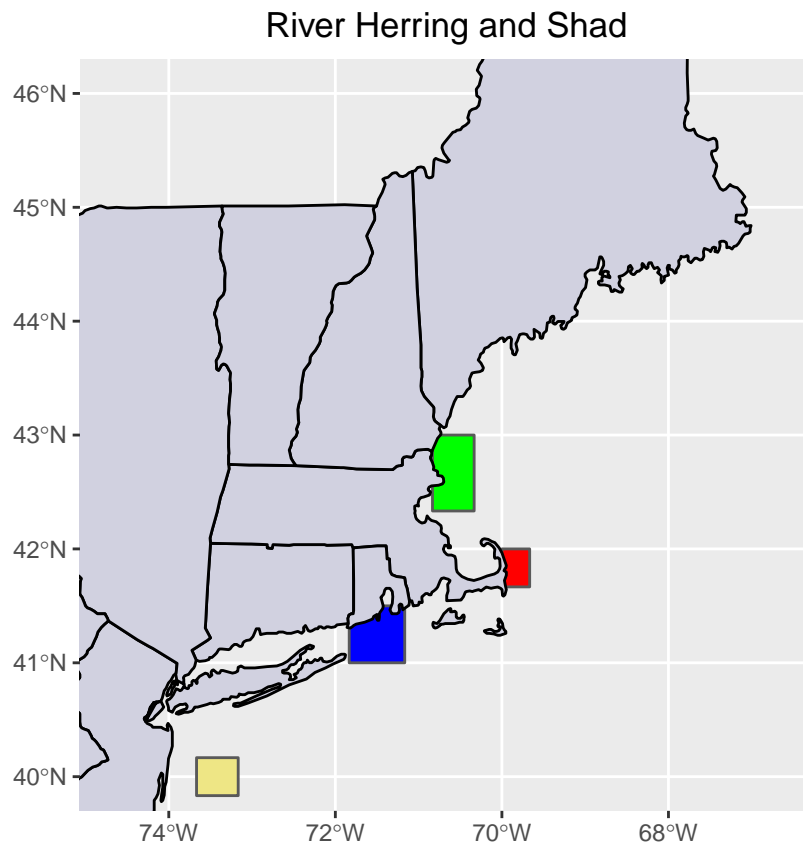


Maps for River Herring: Jan, Feb, Nov, Dec

Min-Yang Lee

March 23, 2022

Maps of Selected Fishery Landings and Revenue



Data sources:

Commerical Fisheries landings data, Vessel Trip Reports, and Surfclam/OceanQuahog Logbooks

Caveats and notes:

- When mapped, values are reported in real (2019) dollars per square kilometer.
- Pounds are reported in landed pounds.
- Data summarized here is based on vessels that are required to provide federal VTRs.

Selected Maps

Midwater Trawl River herring

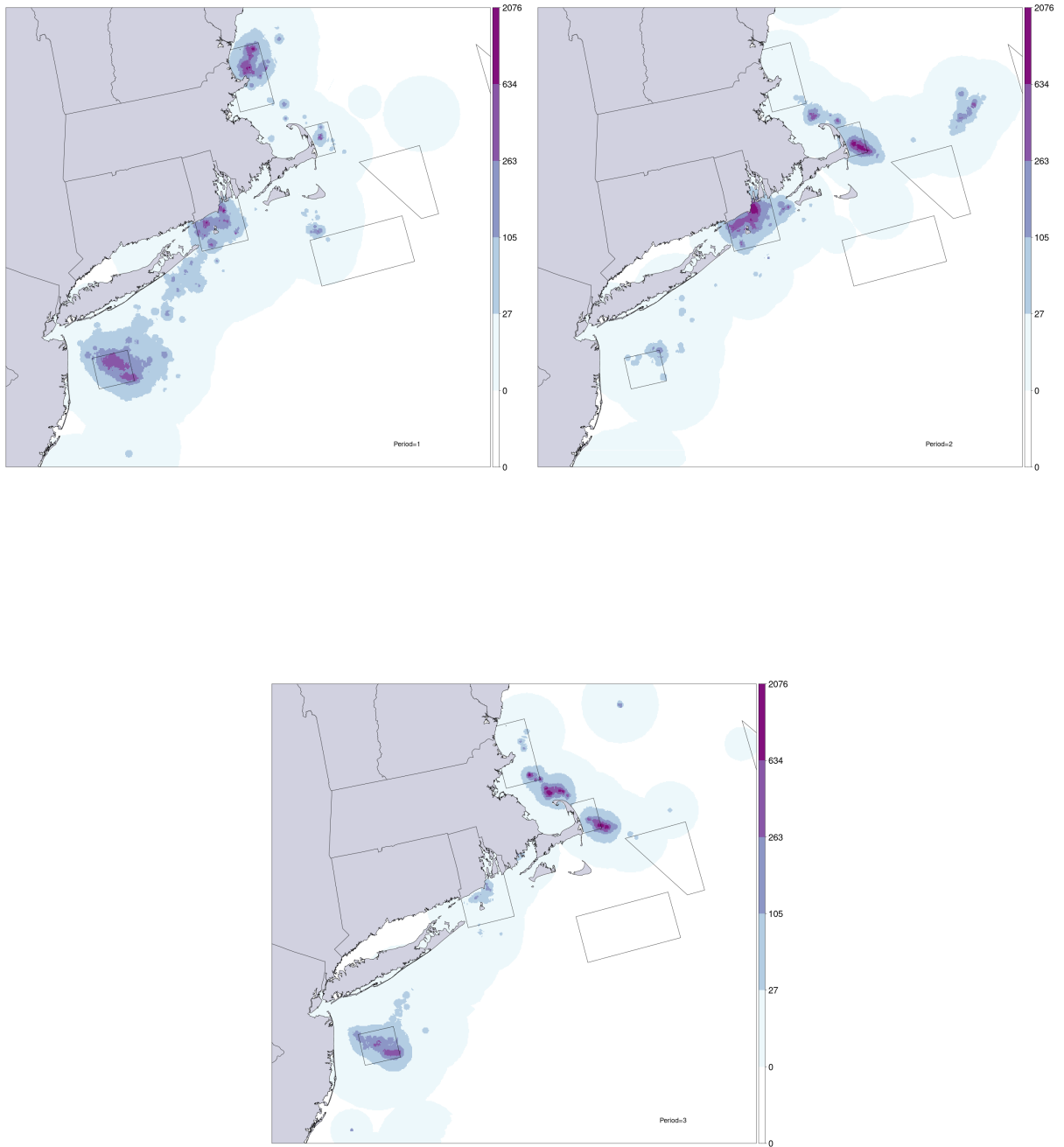


Figure 1: Total Revenue by Midwater Trawl. January, February, November, and December only. Top Left: 2008-2011. Top Right: 2012-2015. Bottom: 2016-2019.

Small Mesh Bottom Trawl River herring

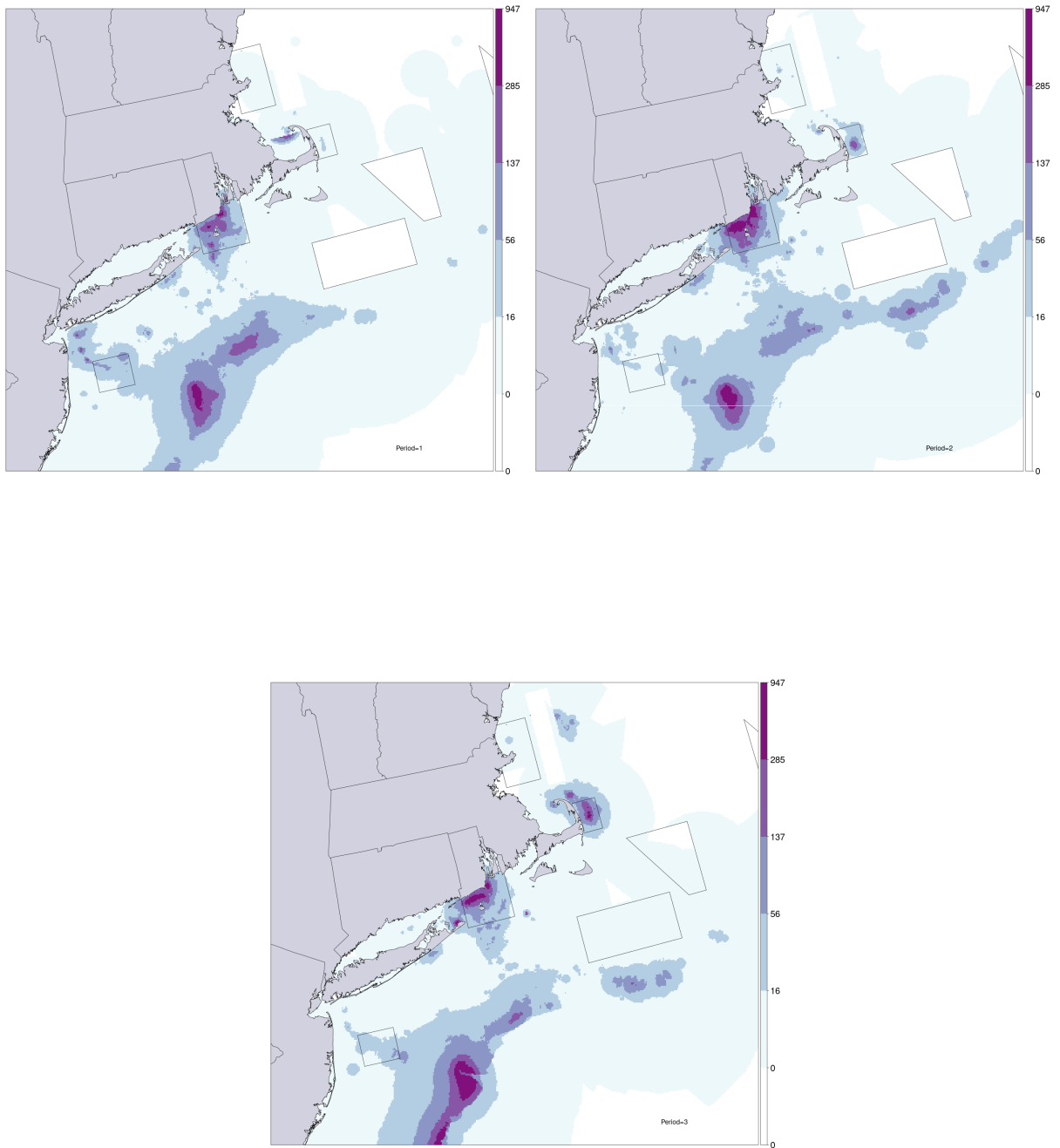


Figure 2: Total Revenue by Small Mesh Bottom Trawl. January, February, November, and December only. Top Left: 2008-2011. Top Right: 2012-2015. Bottom: 2016-2019.

References

- DePiper GS (2014) Statistically assessing the precision of self-reported VTR fishing locations.
Benjamin S, Lee MY, DePiper G. 2018. Visualizing fishing data as rasters. NEFSC Ref Doc 18-12; 24 p.

Tables and Reports for Small Mesh Bottom Trawl - River Herring Areas. Jan, Feb, Nov, Dec only.

Min-Yang Lee

March 17, 2022

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Descriptions of Selected Fishery Landings and Estimates of Vessel Revenue from Selected Areas

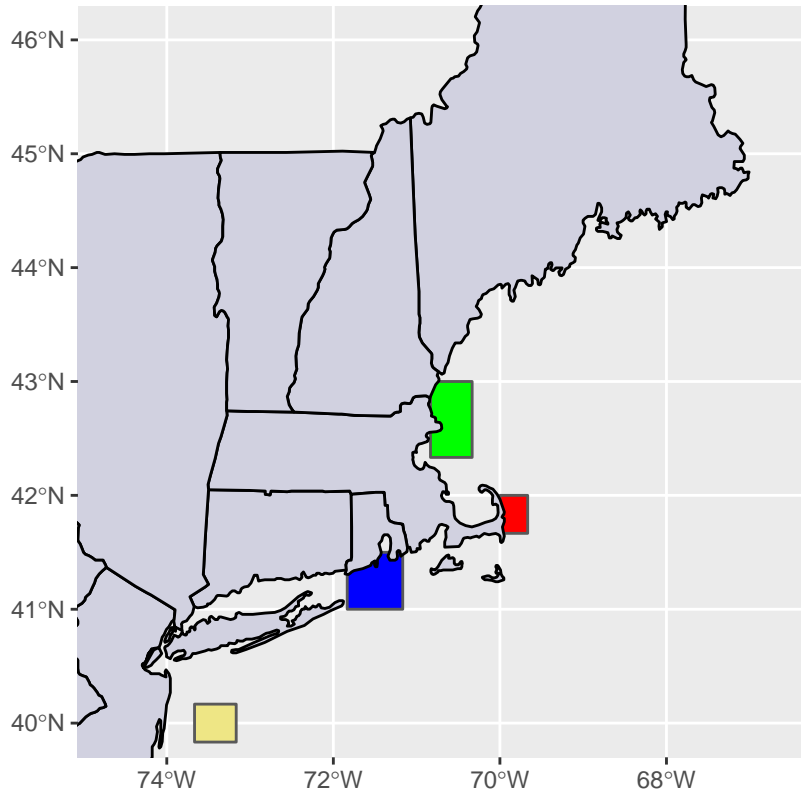
Small Mesh Bottom Trawl only (≤ 3.5 inch mesh).Jan, Feb, Nov, December only.

Please keep in mind that we confined our analysis to only trips that fished with small mesh bottom trawl gear in January, February, November, and December only. This means that, while we have figures that describe impacts in percentage terms (say, the percentage of revenues by a permit that are in a particular area), the denominator in those sections is “small mesh bottom trawl revenue during those months periods” and not “all fishing revenue”

Prepared by:
National Marine Fisheries Service

March 17, 2022

River Herring and Shad



Data sources:

Commerical Fisheries landings data, Vessel Trip Reports, and Surfclam/OceanQuahog Logbooks

In order to meet requirements of maintaining data confidentiality, these strata are presented individually. In addition, records that did not meet the rule of three (≥ 3 unique dealers and ≥ 3 unique permits), values were summarized as ‘ALL OTHERS’.

Some caveats/notes:

- When mapped, values are reported in nominal dollars per square kilometer.
- When mapped, values reported are nominal dollars per square kilometer.
- Values are reported in nominal dollars. Values in 2019 dollars are reported as well (see below for details).
- Pounds are reported in landed (dressed) pounds.
- Data summarized here is based on vessels that are required to provide federal VTRs.
- Federal lobster vessels, with only lobster permits, do not have a VTR requirement. Many Atlantic Highly Migratory Species permitted vessels also do not have a VTR requirement. Trips with no VTR are not reflected in this summary.
- There exist other fisheries in State waters that may not be reflected in data from federal sources (e.g. whelk, bluefish). It is recommended to query state agencies for additional data within state waters.
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References

[DePiper GS \(2014\) Statistically assessing the precision of self-reported VTR fishing locations.](#)

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Most Impacted Species

We analyzed the top 10 species due to their economic importance in the area and to isolate them from combined FMPs. The top 10 species by revenue are: Atlantic Herring, Silver Hake, Atlantic Mackerel, Longfin Squid, Summer Flounder, Butterfish, Scup, Black Sea Bass, Pandalid Shrimp and Red Hake . The category “All Others” refers to species with less than three permits or dealers impacted to protect data confidentiality. Revenue values have been deflated to 2019 dollars. All numbers have been rounded to the nearest thousand.

Figure 1.1 Landings of Top Species, RHS 1 NHMA Merge

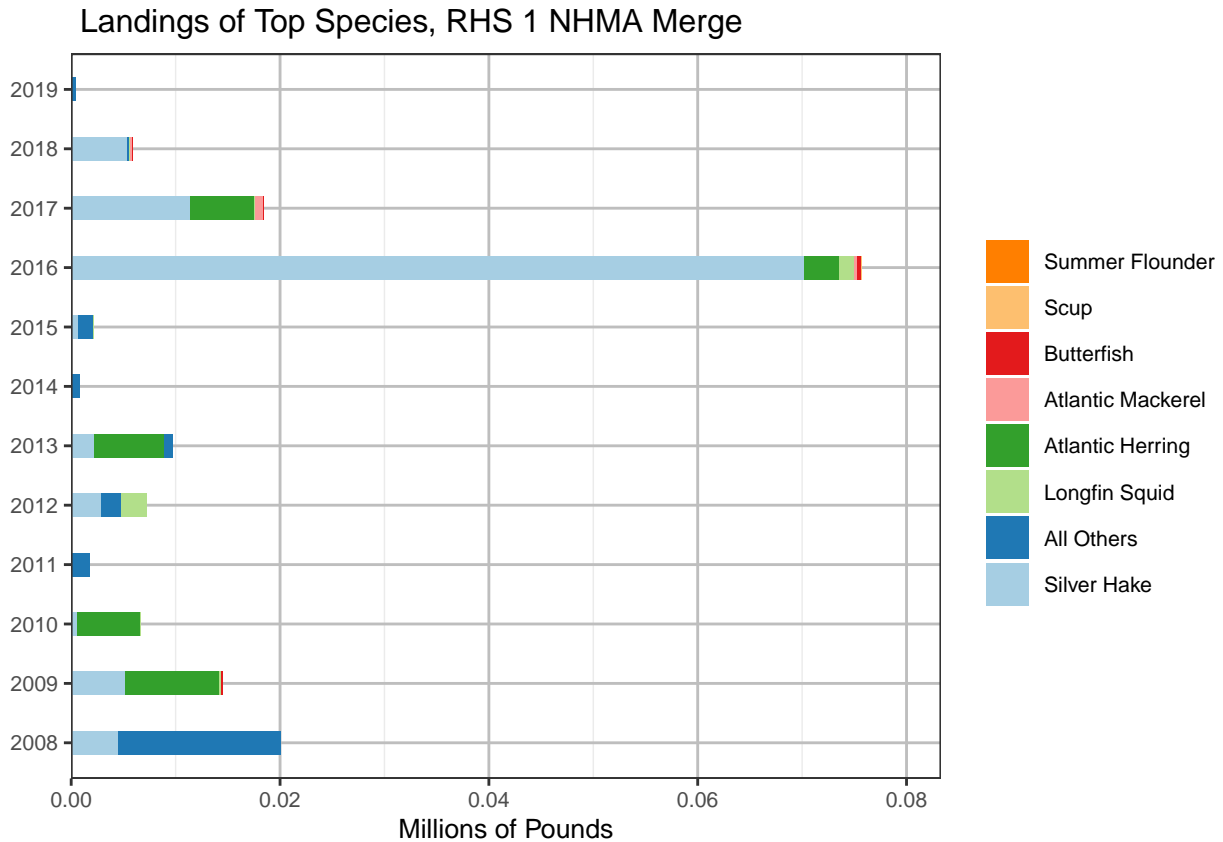


Table 1: Twelve Year Total Landings (Pounds), Most Impacted Species, RHS 1 NHMA Merge

Species	Twelve Year Landings
Silver Hake	103,000
Atlantic Herring	31,000
All Others	23,000
Longfin Squid	4,000
Atlantic Mackerel	1,000
Butterfish	1,000
Scup	<500
Total	164,000

Figure 1.2 Revenue from Most Impacted Species, RHS 1 NHMA Merge

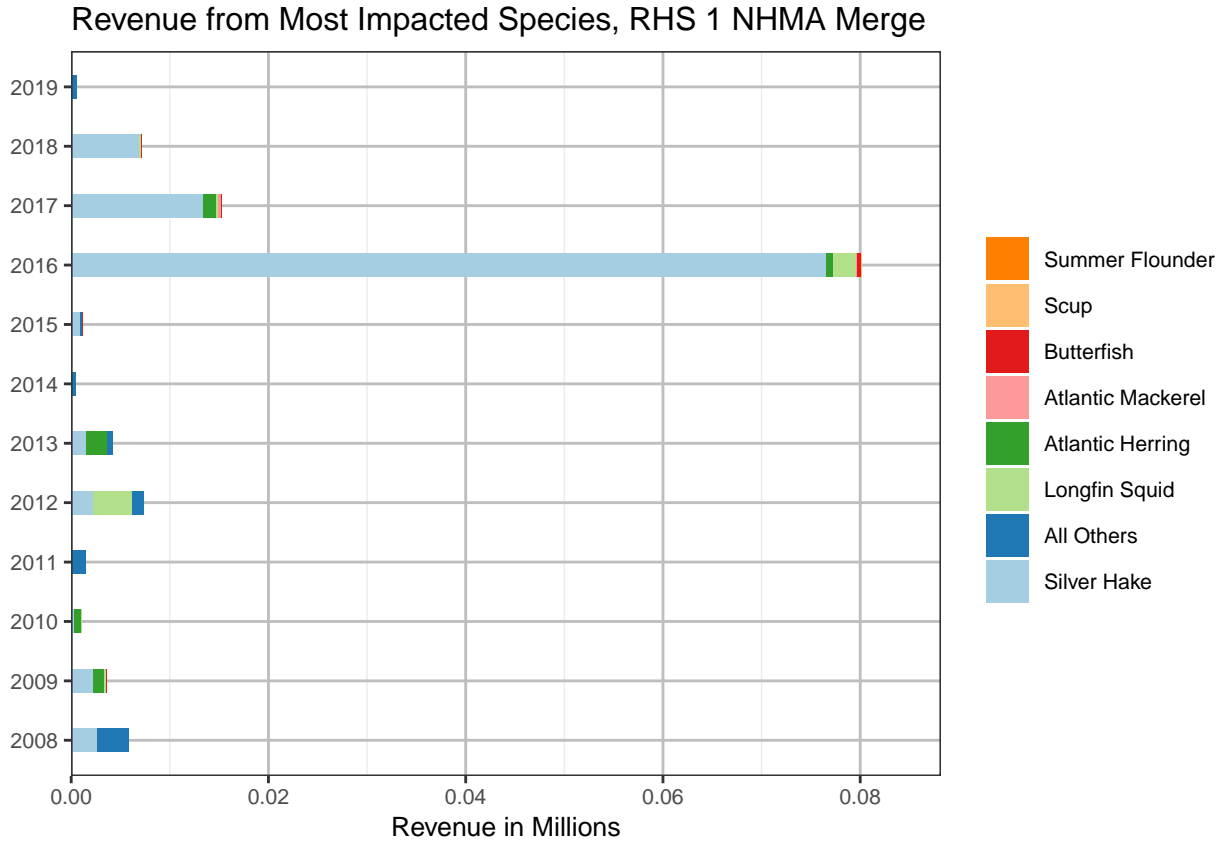


Table 2: Twelve Year Total Revenue, Most Impacted Species, RHS 1 NHMA Merge

Species	Twelve Year Revenue
Silver Hake	\$106,000
All Others	\$8,000
Longfin Squid	\$7,000
Atlantic Herring	\$6,000
Atlantic Mackerel	\$1,000
Butterfish	\$1,000
Scup	<\$500
Total	\$128,000

Figure 1.3 Landings of Top Species, RHS 2 Cape Merge

Landings of Top Species, RHS 2 Cape Merge

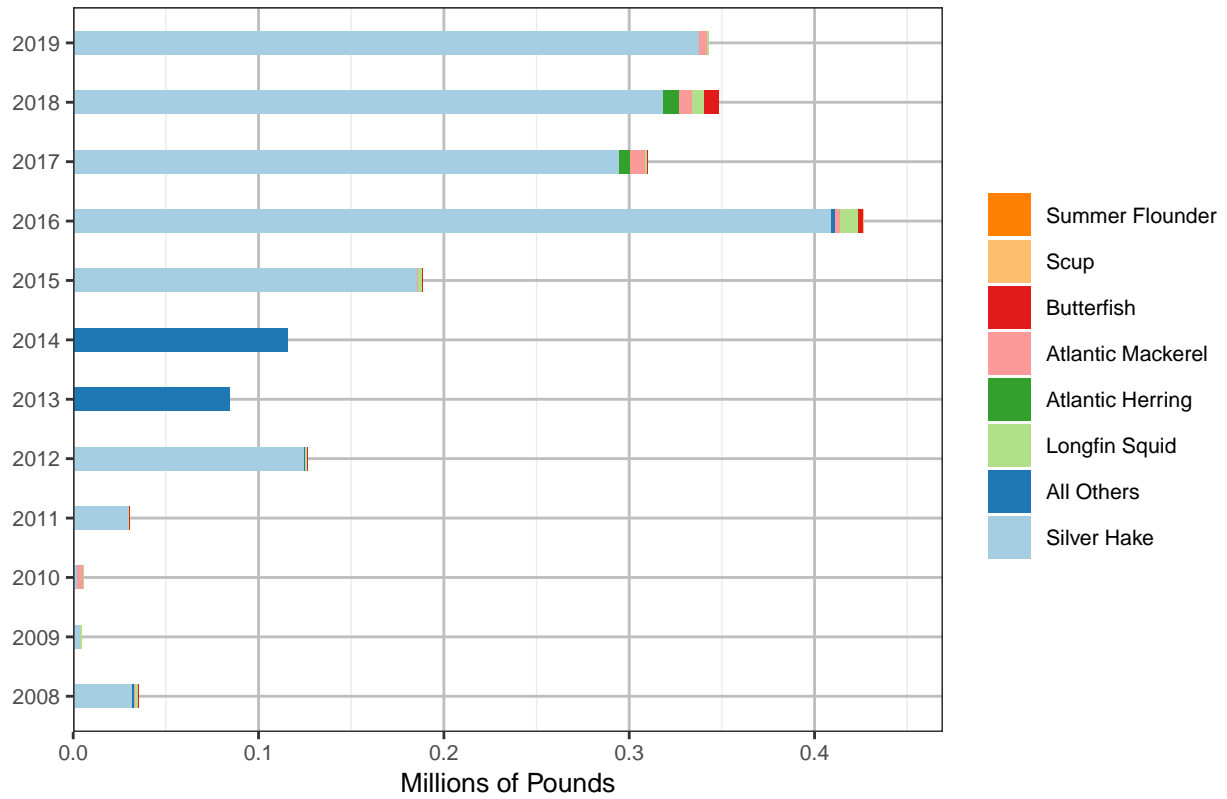


Table 3: Twelve Year Total Landings (Pounds), Most Impacted Species, RHS 2 Cape Merge

Species	Twelve Year Landings
Silver Hake	1,735,000
All Others	206,000
Atlantic Mackerel	27,000
Longfin Squid	23,000
Atlantic Herring	15,000
Butterfish	14,000
Scup	<500
Total	2,019,000

Figure 1.4 Revenue from Most Impacted Species, RHS 2 Cape Merge

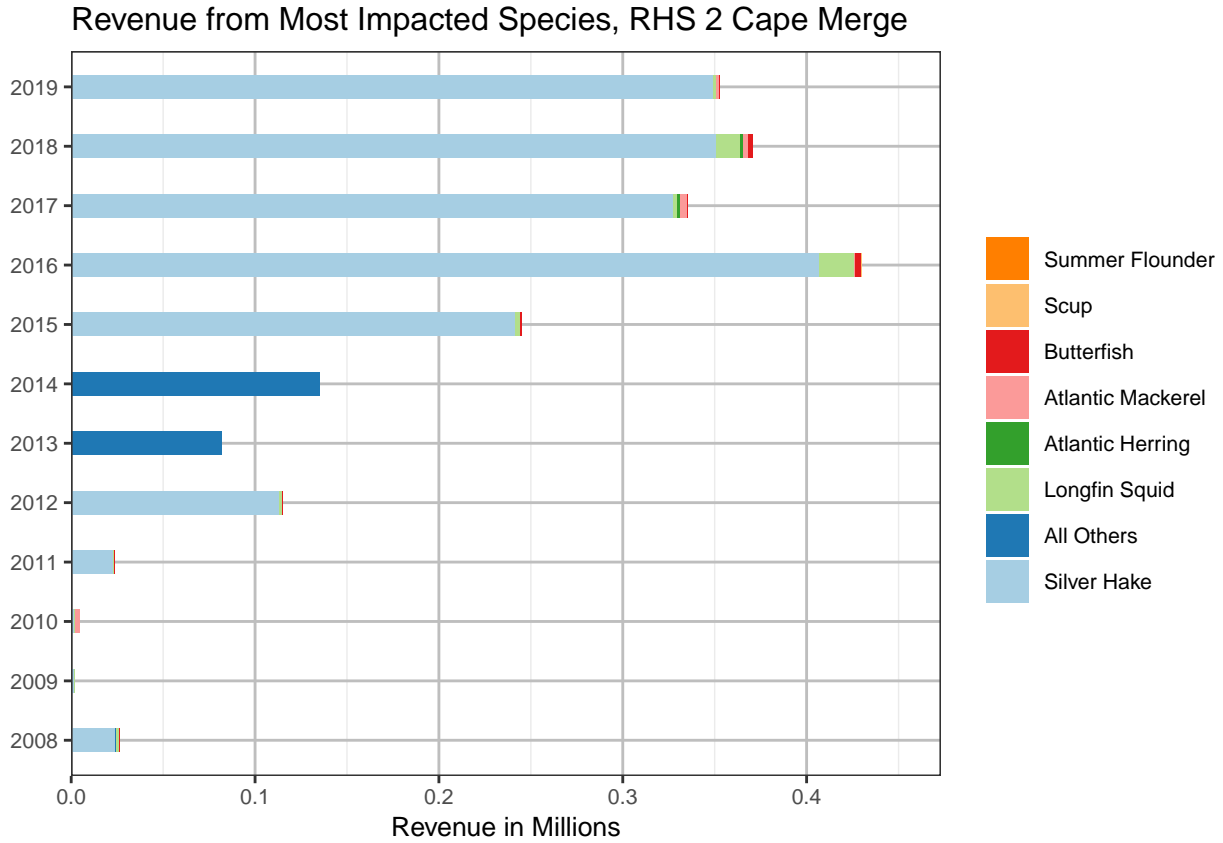


Table 4: Twelve Year Total Revenue, Most Impacted Species, RHS 2 Cape Merge

Species	Twelve Year Revenue
Silver Hake	\$1,837,000
All Others	\$218,000
Longfin Squid	\$42,000
Atlantic Mackerel	\$14,000
Butterfish	\$8,000
Atlantic Herring	\$4,000
Scup	<\$500
Total	\$2,123,000

Figure 1.5 Landings of Top Species, RHS 3 RI Merge

Landings of Top Species, RHS 3 RI Merge

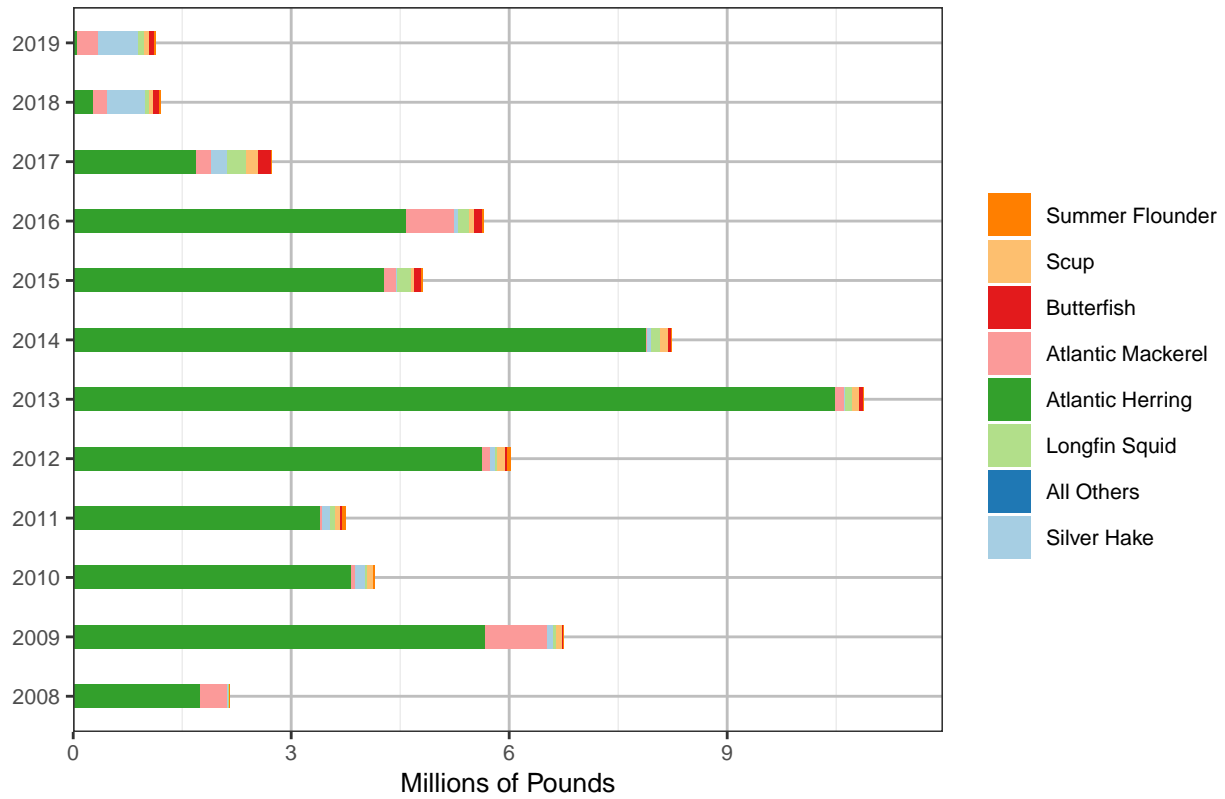


Table 5: Twelve Year Total Landings (Pounds), Most Impacted Species, RHS 3 RI Merge

Species	Twelve Year Landings
Atlantic Herring	49,557,000
Atlantic Mackerel	3,044,000
Silver Hake	1,777,000
Longfin Squid	1,213,000
Scup	879,000
Butterfish	783,000
Summer Flounder	215,000
Total	57,466,000

Figure 1.6 Revenue from Most Impacted Species, RHS 3 RI Merge

Revenue from Most Impacted Species, RHS 3 RI Merge

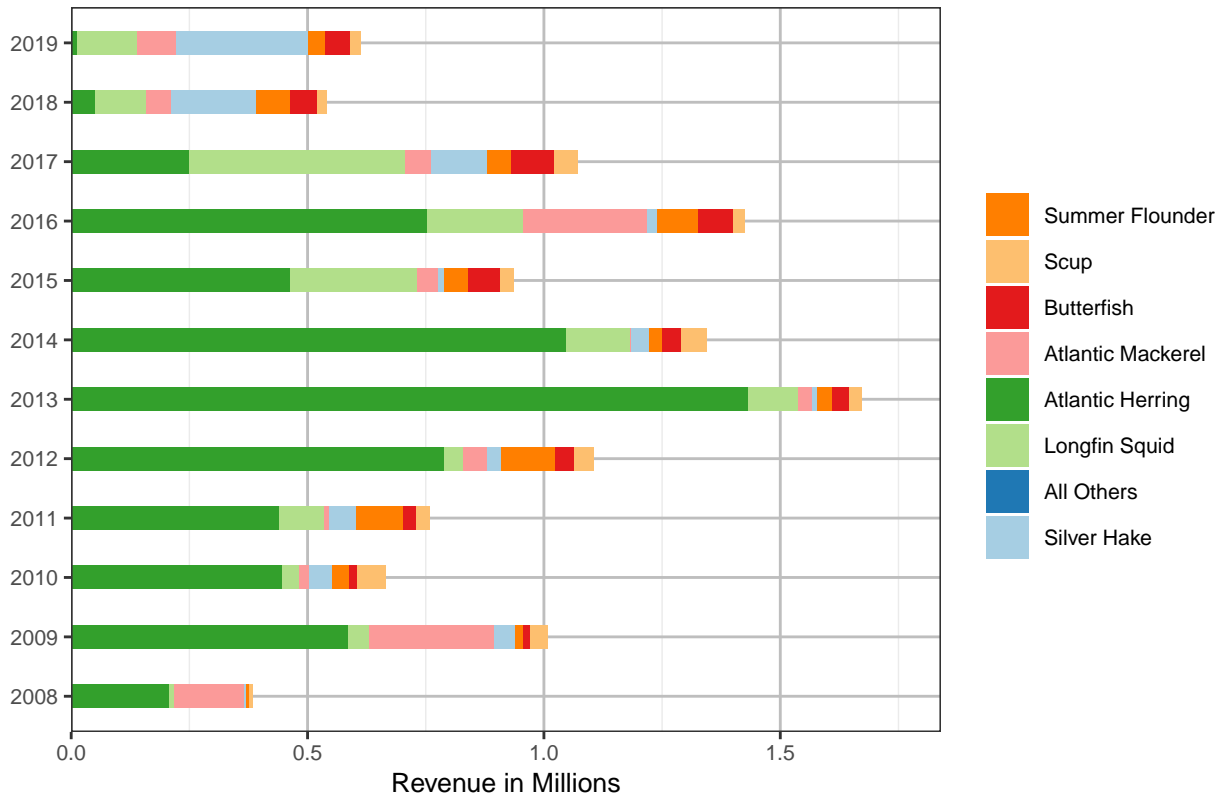


Table 6: Twelve Year Total Revenue, Most Impacted Species, RHS 3 RI Merge

Species	Twelve Year Revenue
Atlantic Herring	\$6,477,000
Longfin Squid	\$1,617,000
Atlantic Mackerel	\$1,037,000
Silver Hake	\$839,000
Summer Flounder	\$620,000
Butterfish	\$532,000
Scup	\$403,000
Total	\$11,525,000

Figure 1.7 Landings of Top Species, RHS 4 NJ Merge

Landings of Top Species, RHS 4 NJ Merge

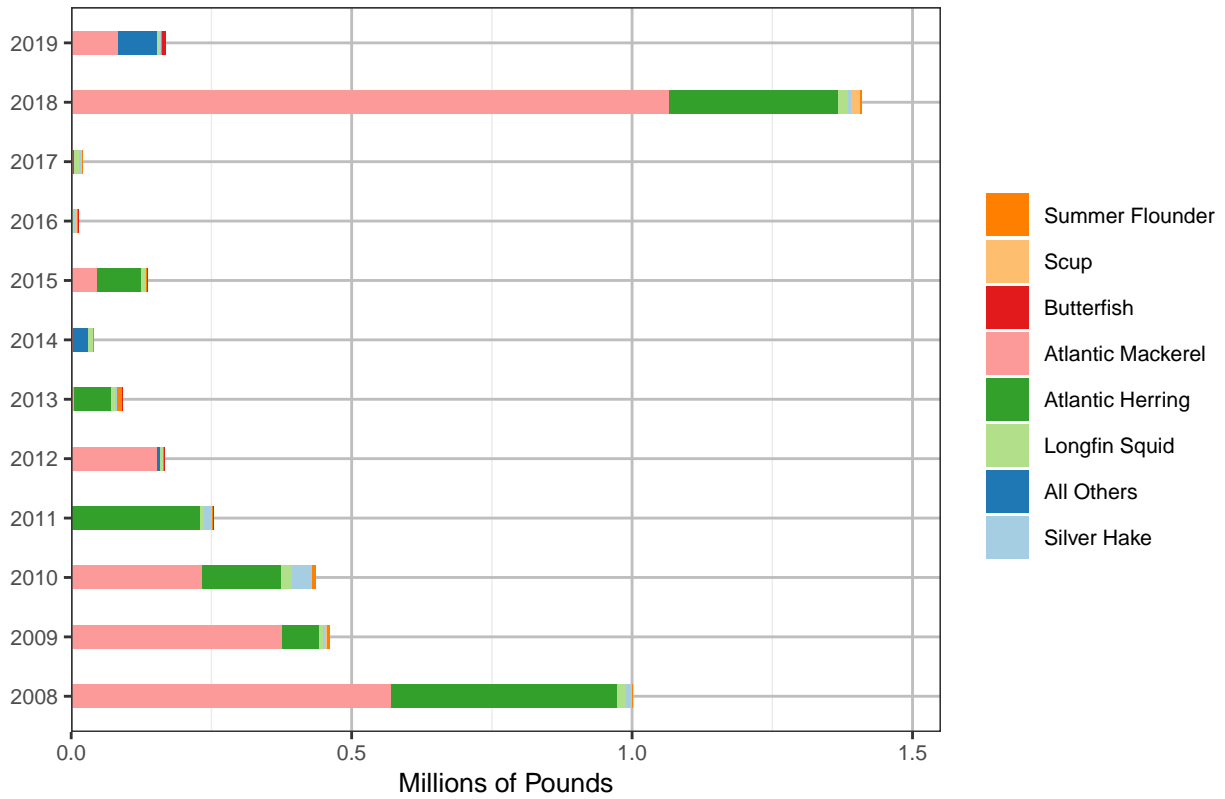


Table 7: Twelve Year Total Landings (Pounds), Most Impacted Species, RHS 4 NJ Merge

Species	Twelve Year Landings
Atlantic Mackerel	2,532,000
Atlantic Herring	1,290,000
All Others	111,000
Longfin Squid	111,000
Silver Hake	78,000
Scup	32,000
Summer Flounder	29,000
Butterfish	12,000
Total	4,196,000

Figure 1.8 Revenue from Most Impacted Species, RHS 4 NJ Merge

Revenue from Most Impacted Species, RHS 4 NJ Merge

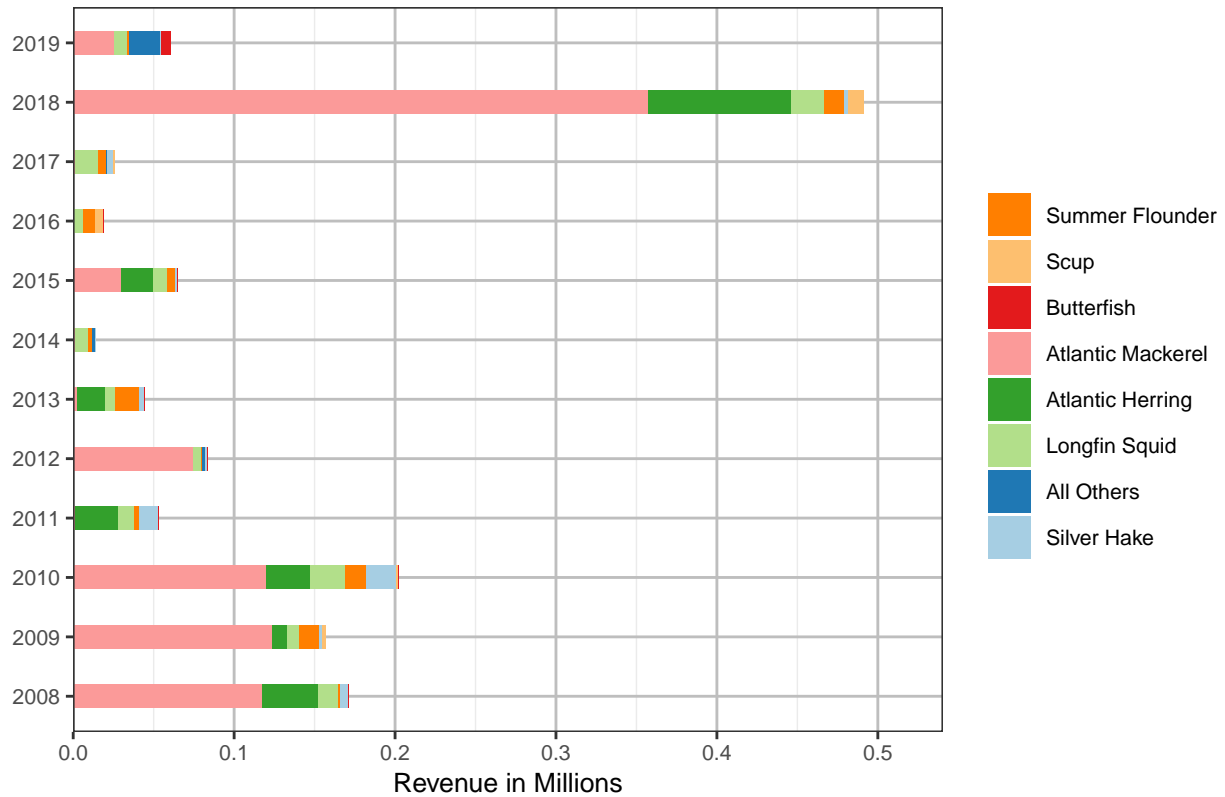


Table 8: Twelve Year Total Revenue, Most Impacted Species, RHS 4 NJ Merge

Species	Twelve Year Revenue
Atlantic Mackerel	\$853,000
Atlantic Herring	\$226,000
Longfin Squid	\$128,000
Summer Flounder	\$75,000
Silver Hake	\$49,000
All Others	\$25,000
Scup	\$22,000
Butterfish	\$8,000
Total	\$1,386,000

Summary

Table 9: Most Impacted Species Twelve Year Revenue and Landings

Area	Twelve Year Revenue	Twelve Year Landings (Pounds)
RHS 1 NHMA Merge	\$ 128,000	164,000
RHS 2 Cape Merge	\$ 2,123,000	2,019,000
RHS 3 RI Merge	\$11,525,000	57,466,000
RHS 4 NJ Merge	\$ 1,386,000	4,196,000
Total	\$15,162,000	63,845,000

Totals

The following tables display the given year total revenue and total landed pounds of all species by all gear types within each area. RHS 3 RI Merge totals the most pounds landed, 58.626 million, and the most revenue derived from within an area, \$12.107 million. All numbers have been rounded to the nearest thousand.

Table 10: Twelve Year Total Revenue and Landings (Pounds), RHS
1 NHMA Merge

Year	Revenue	Landings
2008	\$15,000	26,000
2009	\$23,000	40,000
2010	\$1,000	7,000
2011	\$14,000	19,000
2012	\$101,000	83,000
2013	\$29,000	23,000
2015	\$2,000	3,000
2016	\$81,000	77,000
2017	\$16,000	19,000
2018	\$7,000	6,000
All Others	\$1,000	1,000
Total	\$291,000	303,000

Table 11: Twelve Year Total Revenue and Landings (Pounds), RHS
2 Cape Merge

Year	Revenue	Landings
2008	\$27,000	36,000
2009	\$3,000	5,000
2010	\$5,000	6,000
2011	\$31,000	39,000
2012	\$119,000	131,000
2013	\$83,000	85,000
2015	\$247,000	191,000
2016	\$440,000	434,000
2017	\$339,000	314,000
2018	\$378,000	366,000
2019	\$356,000	346,000
All Others	\$136,000	117,000
Total	\$2,164,000	2,071,000

Table 12: Twelve Year Total Revenue and Landings (Pounds), RHS
3 RI Merge

Year	Revenue	Landings
2008	\$403,000	2,184,000
2009	\$1,036,000	6,825,000
2010	\$709,000	4,222,000
2011	\$874,000	3,941,000
2012	\$1,162,000	6,179,000

Year	Revenue	Landings
2013	\$1,702,000	10,927,000
2014	\$1,380,000	8,326,000
2015	\$981,000	4,906,000
2016	\$1,473,000	5,732,000
2017	\$1,142,000	2,850,000
2018	\$610,000	1,356,000
2019	\$636,000	1,179,000
Total	\$12,107,000	58,626,000

Table 13: Twelve Year Total Revenue and Landings (Pounds), RHS
4 NJ Merge

Year	Revenue	Landings
2008	\$177,000	1,008,000
2009	\$181,000	537,000
2010	\$231,000	489,000
2011	\$67,000	297,000
2012	\$87,000	169,000
2013	\$57,000	115,000
2014	\$20,000	71,000
2015	\$65,000	138,000
2016	\$21,000	20,000
2017	\$29,000	32,000
2018	\$500,000	1,442,000
2019	\$63,000	180,000
Total	\$1,500,000	4,497,000

Table 14: Twelve Year Total Revenue and Landings, All Areas

Year	Revenue	Landings (Pounds)
2008	\$622,000	3,254,000
2009	\$1,242,000	7,408,000
2010	\$946,000	4,723,000
2011	\$987,000	4,296,000
2012	\$1,468,000	6,562,000
2013	\$1,871,000	11,150,000
2014	\$1,400,000	8,397,000
2015	\$1,296,000	5,238,000
2016	\$2,016,000	6,262,000
2017	\$1,526,000	3,215,000
2018	\$1,495,000	3,170,000
2019	\$1,056,000	1,705,000
All Others	\$137,000	118,000
Total	\$16,062,000	65,498,000

Revenue by Port

The ten most impacted (by revenue) ports are listed below. These ports are estimated to receive the most landings from fishing done within the River Herring and Shad areas. The table below displays each port's landings breakdown by area. Both tables present the cumulative revenues from 2008-2019. Point Judith receives the highest value of landings of any port, with \$8.297 million from 2008-2019. All numbers have been rounded to the nearest thousand.

Table 15: Most Impacted Ports, by Landings Revenues

City	State	Twelve Year Revenue
Point Judith	RI	\$8,297,000
All Others		\$2,585,000
Gloucester	MA	\$1,517,000
North Kingstown	RI	\$915,000
New Bedford	MA	\$692,000
Newport	RI	\$671,000
Montauk	NY	\$447,000
Stonington	CT	\$394,000
Point Pleasant	NJ	\$154,000
Cape May	NJ	\$92,000

Table 16: Landings by Area

Port	Rhs 1 Nhma Merge	Rhs 2 Cape Merge	Rhs 3 Ri Merge	Rhs 4 Nj Merge
Point Judith, RI	NA	NA	\$8,176,000	\$121,000
All Others	\$104,000	\$49,000	\$2,382,000	\$50,000
Gloucester, MA	\$103,000	\$1,414,000	NA	NA
North Kingstown, RI	NA	NA	NA	\$915,000
New Bedford, MA	\$13,000	\$665,000	\$11,000	\$2,000
Newport, RI	NA	NA	\$649,000	\$22,000
Montauk, NY	NA	NA	\$432,000	\$15,000
Stonington, CT	NA	NA	\$392,000	\$1,000
Point Pleasant, NJ	NA	NA	<\$500	\$154,000
Cape May, NJ	NA	NA	NA	\$92,000

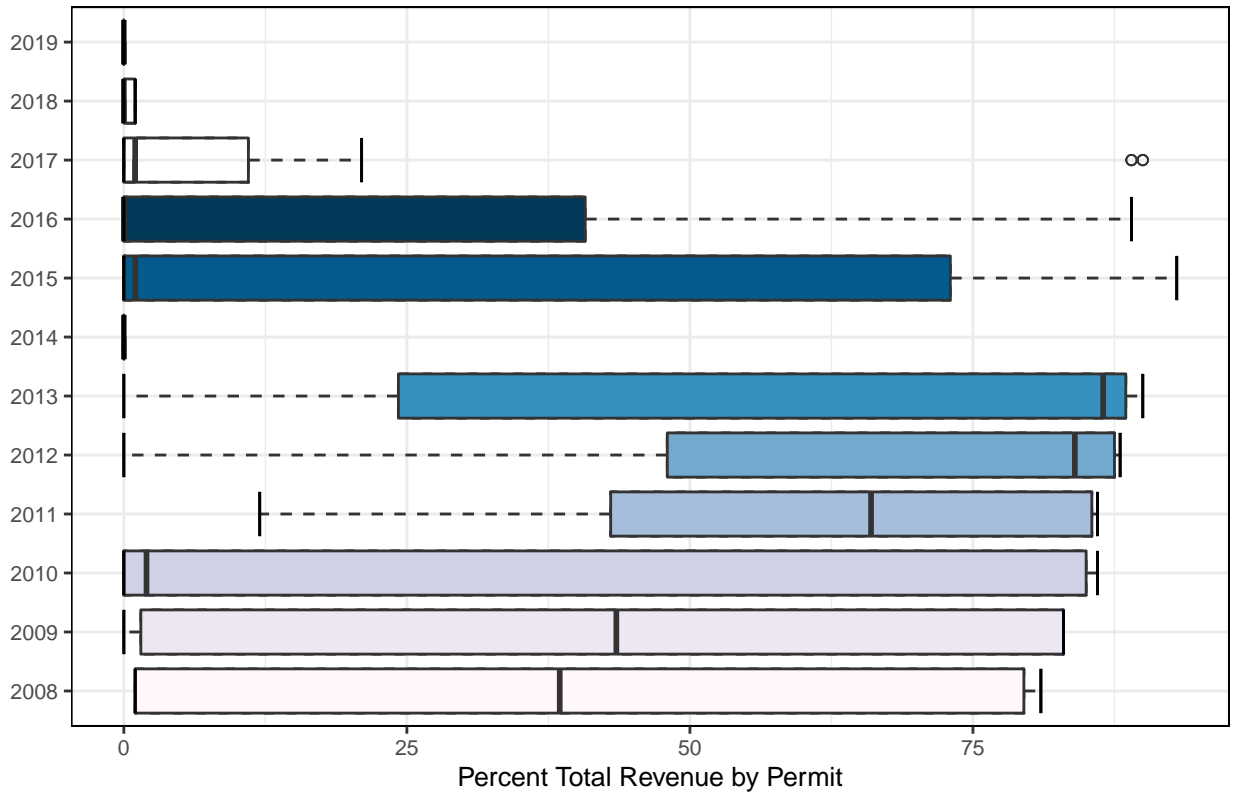
Percentage of Revenue by Permit

We also analyzed the percentage of each permit's total commercial fishing revenue coming from within the River Herring and Shad areas (see boxplots figures and tables below). Boxplots are important statistical summaries because they provide information about the distribution of the percentages. The boxplots below begin at the 1st quartile, or the value beneath which 25 percent of all observations fall. A thick line within the box identifies the median, the observation at which 50 percent of observations are above or beneath. The box ends at the 3rd quartile, or the observation beneath which 75 percent of observations fall.

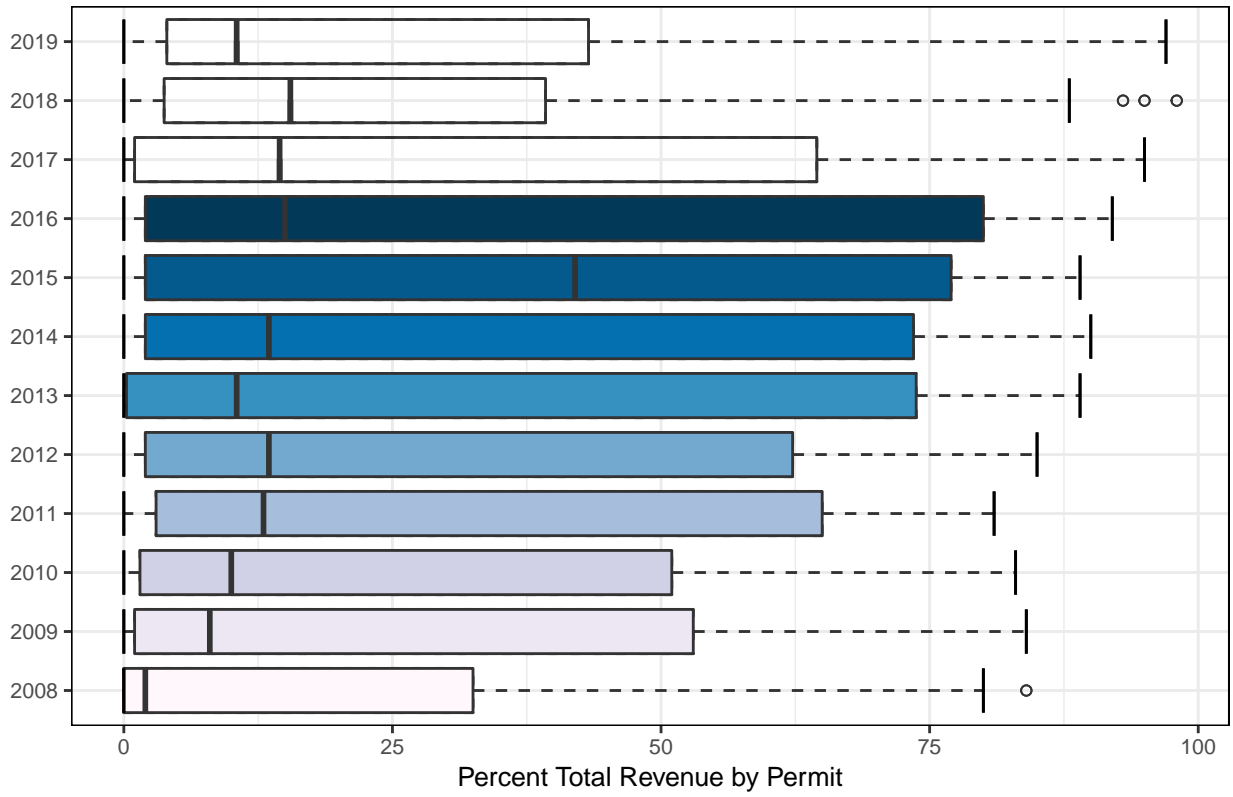
Nonparametric estimates of the minimum and maximum values are also indicated by the "whiskers" (dashed line terminating in a vertical line) that jut out from each side of the box. Any points outside of these whiskers are observations that are considered outliers. In our tables, however, the maximum values are inclusive of outliers. The table below presents the minimum, 1st quartile, median, 3rd quartile, and maximum values for each area. These are the twelve year revenue percentages. The boxplots in the figures below further separate each area out by year.

Area	Min	1st Quartile	Median	3rd Quartile	Max
Rhs 1 Nhma Merge	0	0.57	41	84	90
Rhs 3 Ri Merge	0	0.92	10	58	94
Rhs 2 Cape Merge	0	0.33	6	19	75
Rhs 4 Nj Merge	0	0.05	0.21	2	66

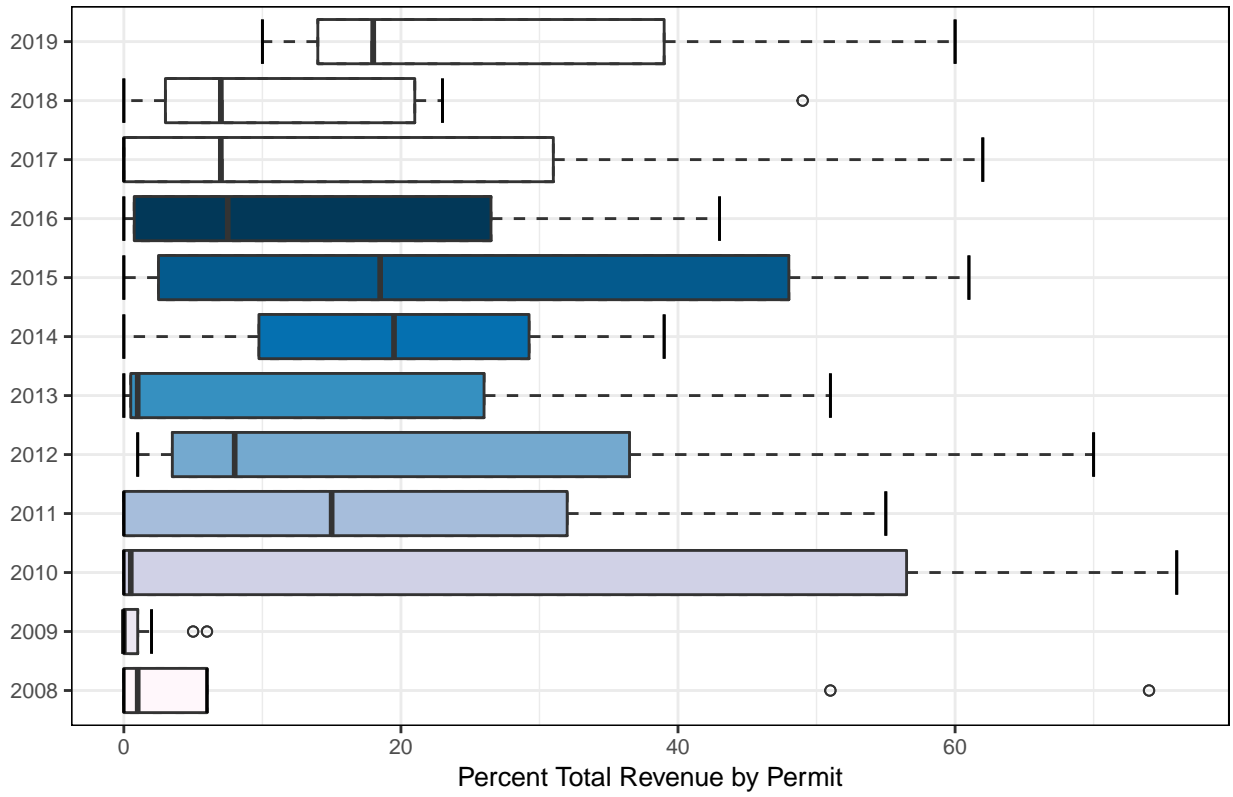
Annual Permit Revenue Percentage Boxplots, Rhs 1 Nhma Merge



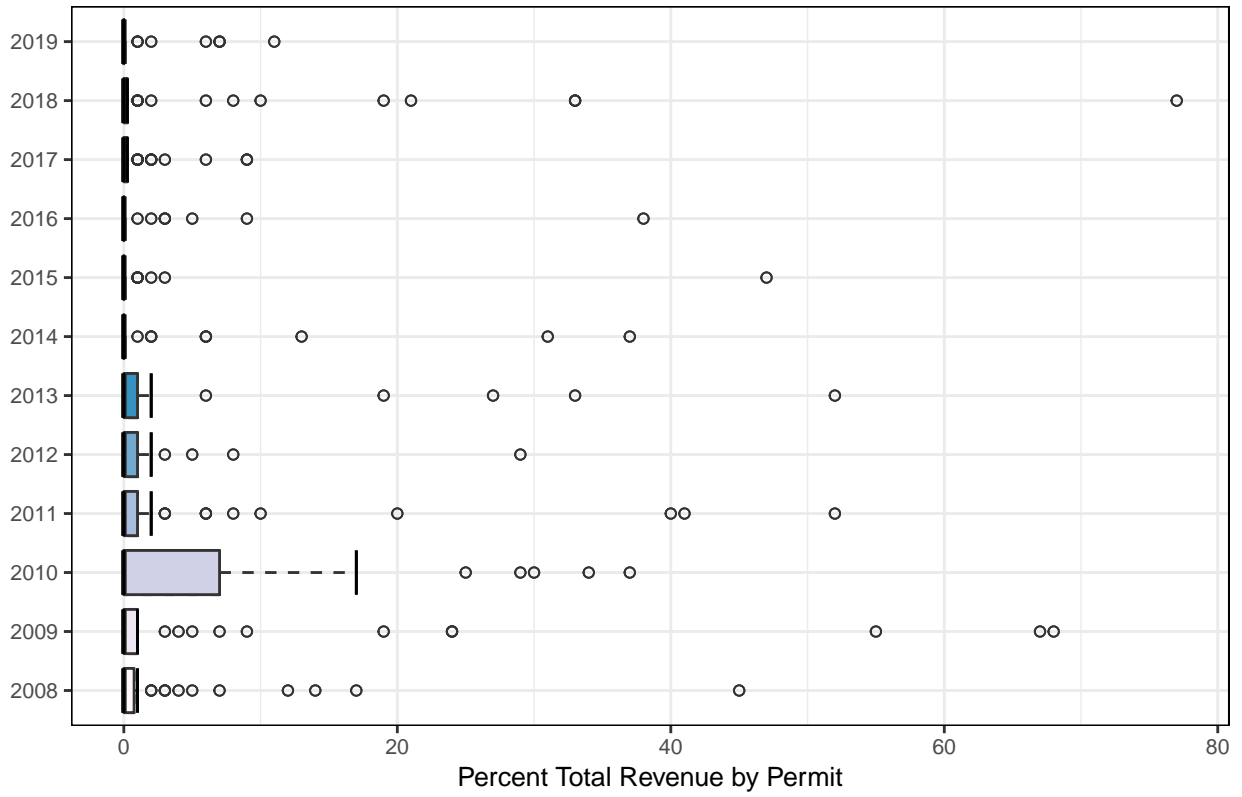
Annual Permit Revenue Percentage Boxplots, Rhs 3 Ri Merge



Annual Permit Revenue Percentage Boxplots, Rhs 2 Cape Merge



Annual Permit Revenue Percentage Boxplots, Rhs 4 Nj Merge



Tables and Reports for Midwater Trawl - River Herring Areas. Jan, Feb, Nov, Dec only.

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March 17, 2022

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Descriptions of Selected Fishery Landings and Estimates of Vessel Revenue from Selected Areas

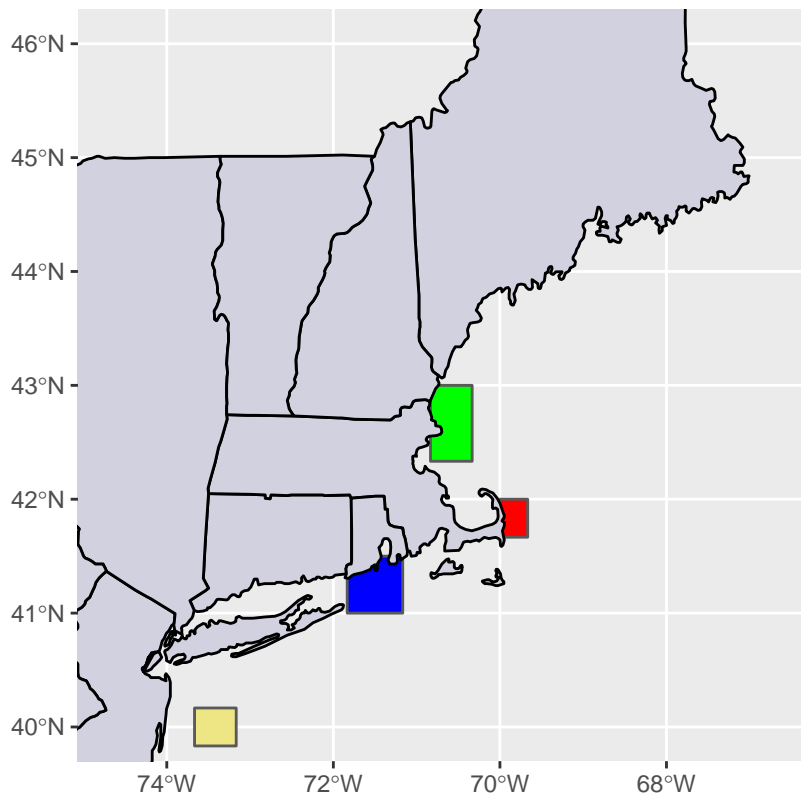
Midwater and Paired Midwater Trawl Only. Jan, Feb, Nov, December only.

Please keep in mind that we confined our analysis to only trips that fished with midwater trawl gear in January, February, November, and December only. This means that, while we have figures that describe impacts in percentage terms (say, the percentage of revenues by a permit that are in a particular area), the denominator in those sections is “midwater trawl revenue during those months periods” and not “all fishing revenue”

Prepared by:
National Marine Fisheries Service

March 17, 2022

River Herring and Shad



Data sources:

Commerical Fisheries landings data, Vessel Trip Reports, and Surfclam/OceanQuahog Logbooks

In order to meet requirements of maintaining data confidentiality, these strata are presented individually. In addition, records that did not meet the rule of three (≥ 3 unique dealers and ≥ 3 unique permits), values were summarized as ‘ALL OTHERS’.

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Most Impacted Species

We analyzed the top 10 species due to their economic importance in the area and to isolate them from combined FMPs. The top 10 species by revenue are: Atlantic Herring, Atlantic Mackerel, All Others, Menhaden, Blue Back Herring, Red Hake, Dogfish Spiny, Longfin Squid, Alewife and Silver Hake . The category “All Others” refers to species with less than three permits or dealers impacted to protect data confidentiality. Revenue values have been deflated to 2019 dollars. All numbers have been rounded to the nearest thousand.

Figure 1.1 Landings of Top Species, RHS 1 NHMA Merge

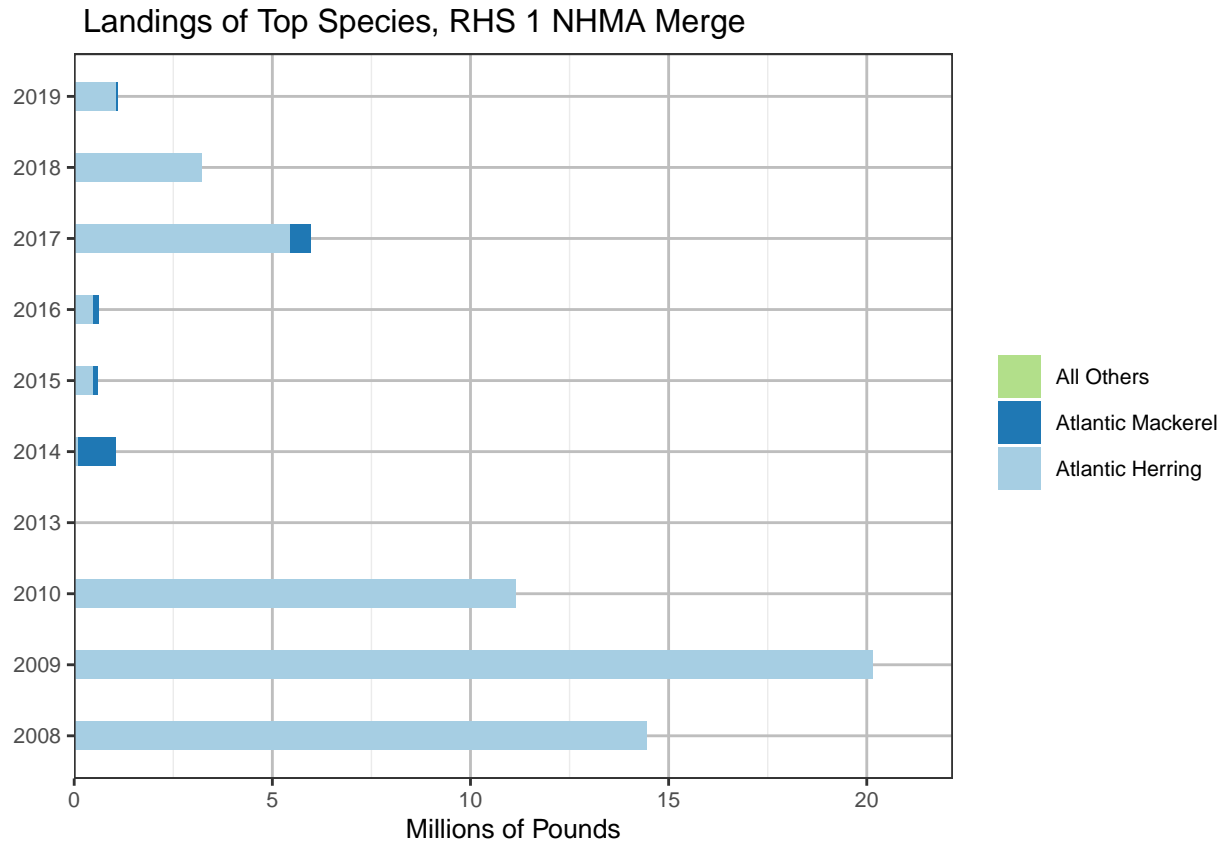


Table 1: Twelve Year Total Landings (Pounds), Most Impacted Species, RHS 1 NHMA Merge

Species	Twelve Year Landings
Atlantic Herring	56,535,000
Atlantic Mackerel	1,772,000
All Others	8,000
Total	58,315,000

Figure 1.2 Revenue from Most Impacted Species, RHS 1 NHMA Merge

Revenue from Most Impacted Species, RHS 1 NHMA Merge

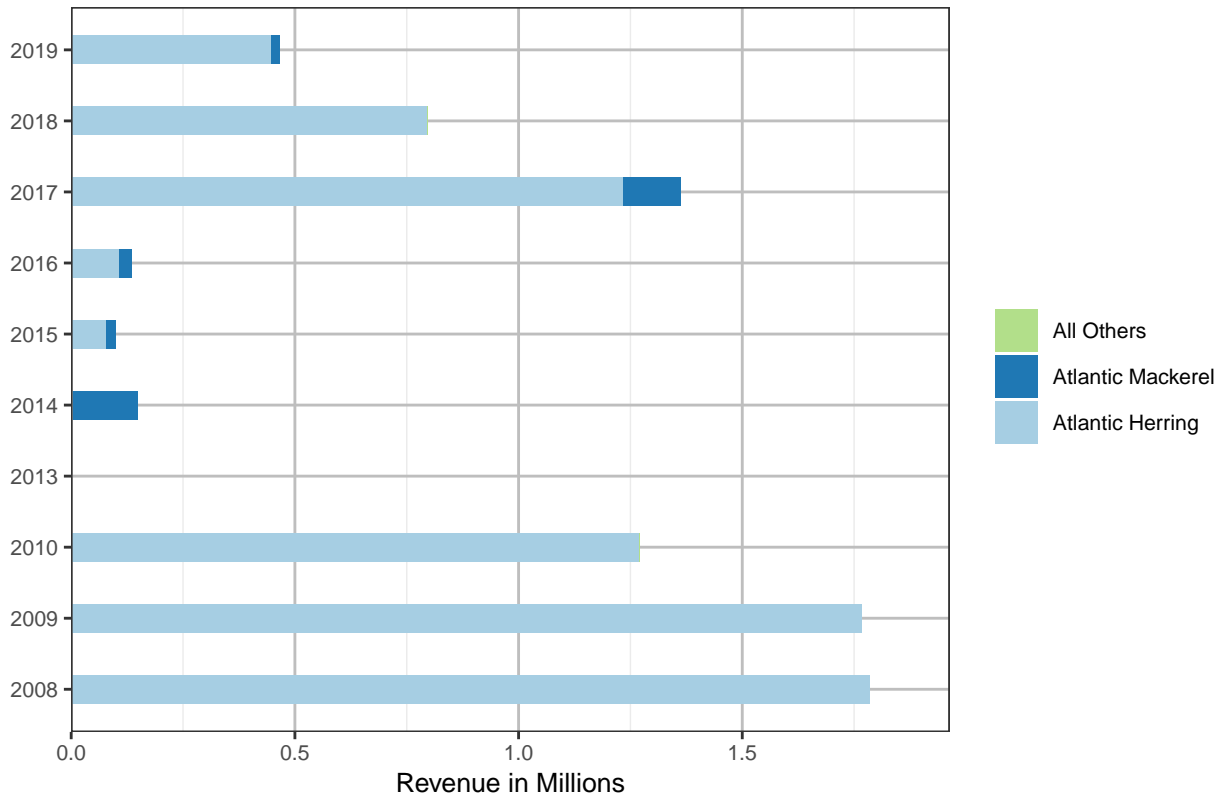


Table 2: Twelve Year Total Revenue, Most Impacted Species, RHS 1 NHMA Merge

Species	Twelve Year Revenue
Atlantic Herring	\$7,490,000
Atlantic Mackerel	\$341,000
All Others	\$4,000
Total	\$7,835,000

Figure 1.3 Landings of Top Species, RHS 2 Cape Merge

Landings of Top Species, RHS 2 Cape Merge

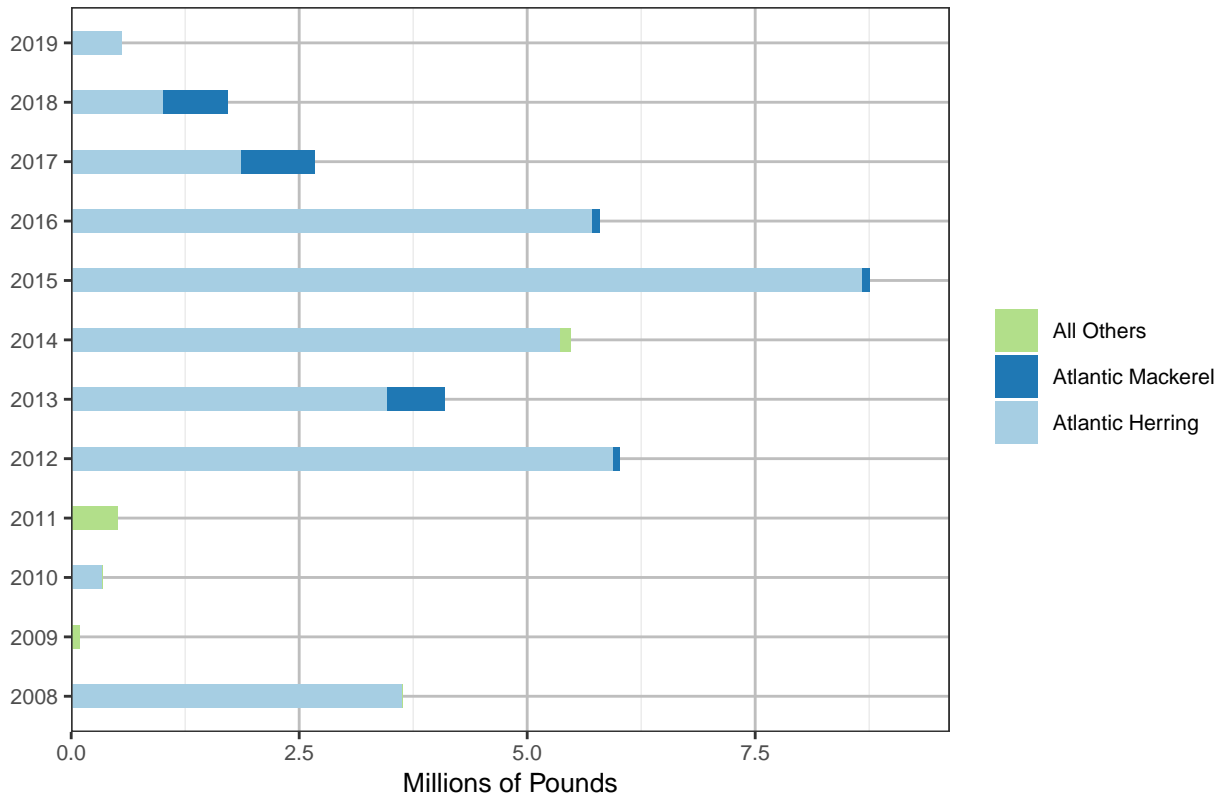


Table 3: Twelve Year Total Landings (Pounds), Most Impacted Species, RHS 2 Cape Merge

Species	Twelve Year Landings
Atlantic Herring	36,537,000
Atlantic Mackerel	2,376,000
All Others	735,000
Total	39,648,000

Figure 1.4 Revenue from Most Impacted Species, RHS 2 Cape Merge

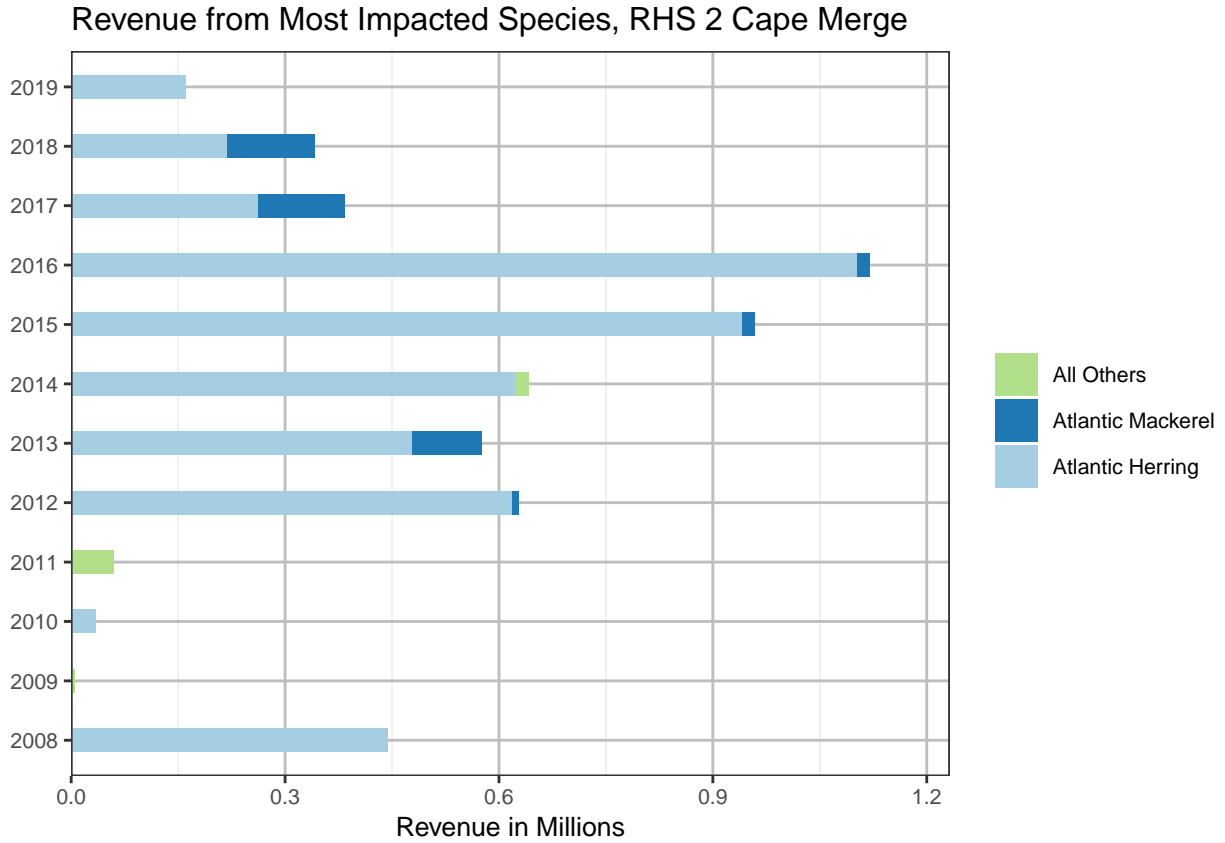


Table 4: Twelve Year Total Revenue, Most Impacted Species, RHS 2 Cape Merge

Species	Twelve Year Revenue
Atlantic Herring	\$4,880,000
Atlantic Mackerel	\$386,000
All Others	\$86,000
Total	\$5,352,000

Figure 1.5 Landings of Top Species, RHS 3 RI Merge

Landings of Top Species, RHS 3 RI Merge

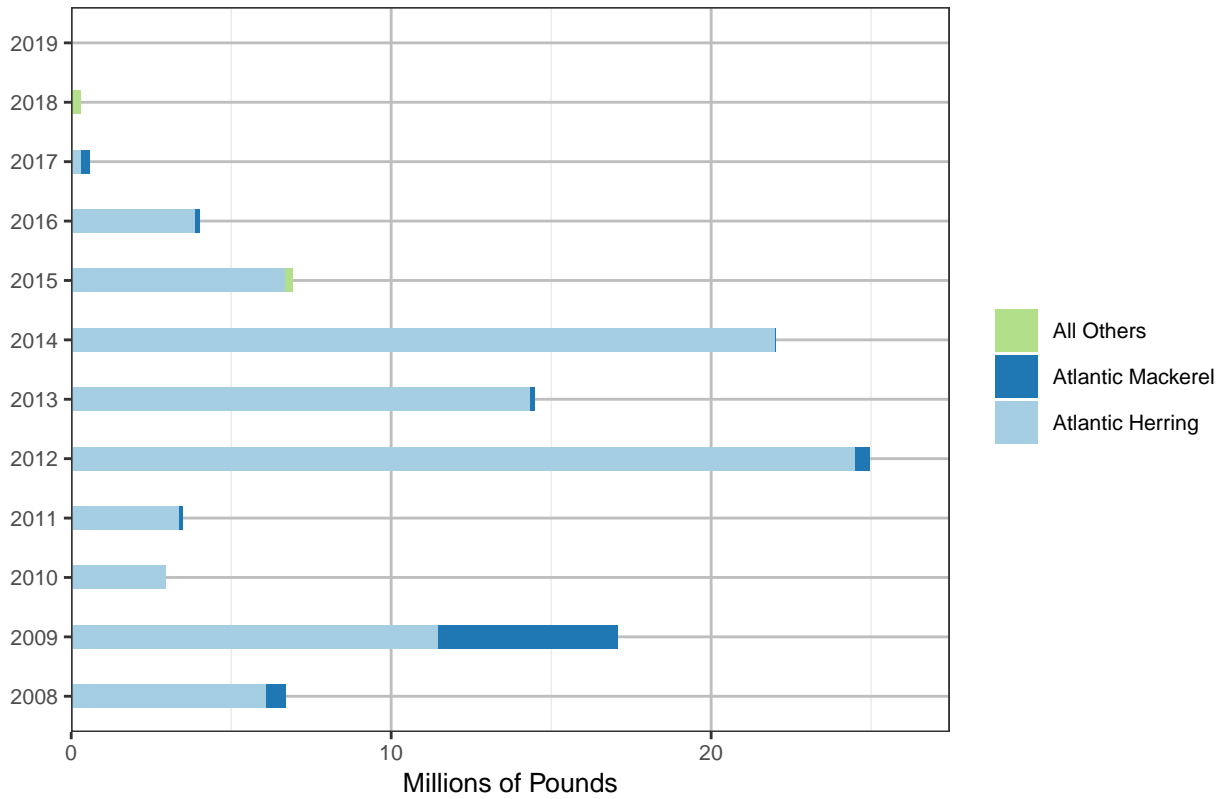


Table 5: Twelve Year Total Landings (Pounds), Most Impacted Species, RHS 3 RI Merge

Species	Twelve Year Landings
Atlantic Herring	95,618,000
Atlantic Mackerel	7,403,000
All Others	543,000
Total	103,564,000

Figure 1.6 Revenue from Most Impacted Species, RHS 3 RI Merge

Revenue from Most Impacted Species, RHS 3 RI Merge

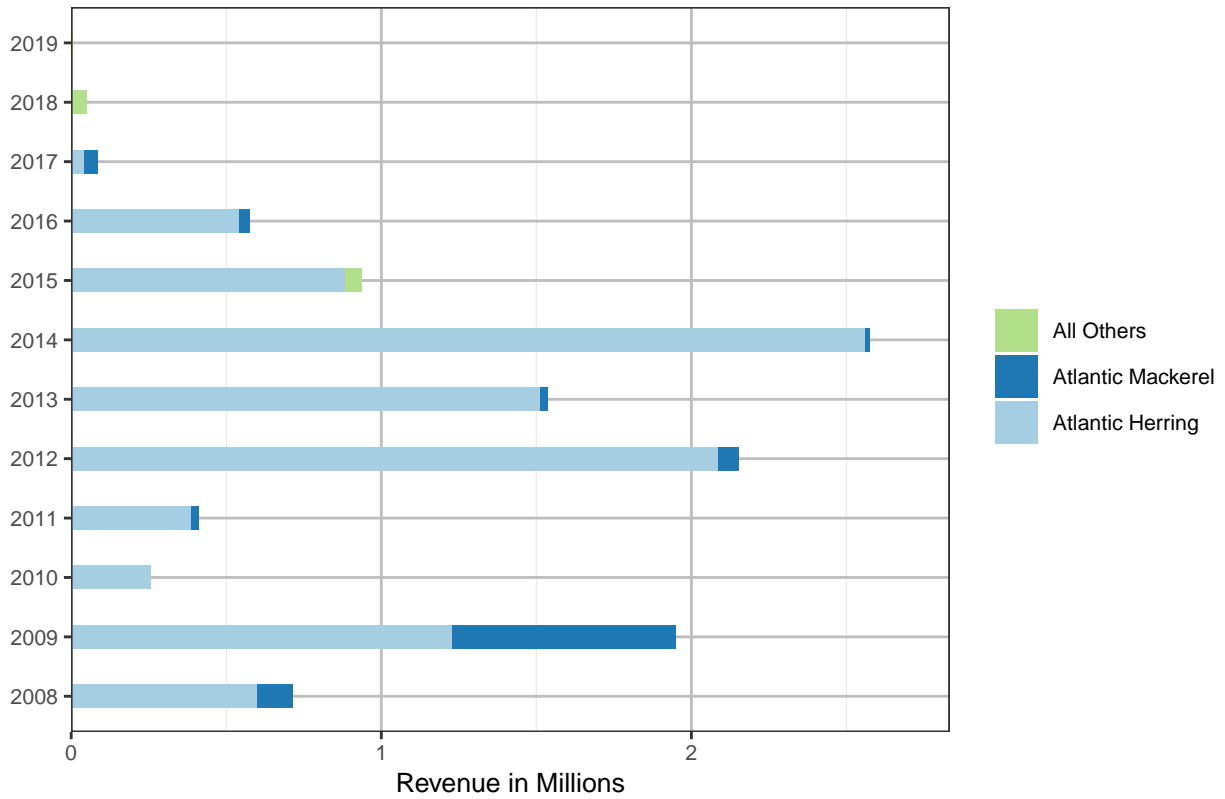


Table 6: Twelve Year Total Revenue, Most Impacted Species, RHS 3 RI Merge

Species	Twelve Year Revenue
Atlantic Herring	\$10,095,000
Atlantic Mackerel	\$1,041,000
All Others	\$107,000
Total	\$11,243,000

Figure 1.7 Landings of Top Species, RHS 4 NJ Merge

Landings of Top Species, RHS 4 NJ Merge

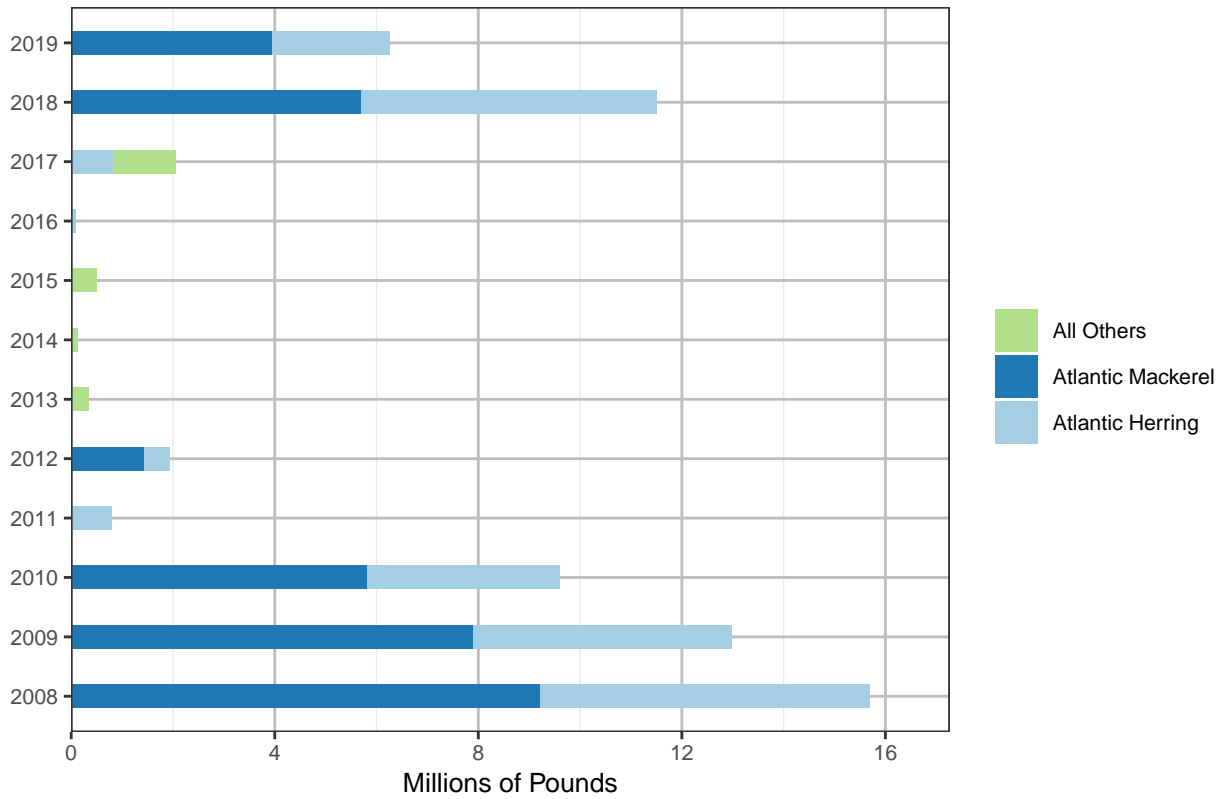


Table 7: Twelve Year Total Landings (Pounds), Most Impacted Species, RHS 4 NJ Merge

Species	Twelve Year Landings
Atlantic Mackerel	33,942,000
Atlantic Herring	25,743,000
All Others	2,222,000
Total	61,908,000

Figure 1.8 Revenue from Most Impacted Species, RHS 4 NJ Merge

Revenue from Most Impacted Species, RHS 4 NJ Merge

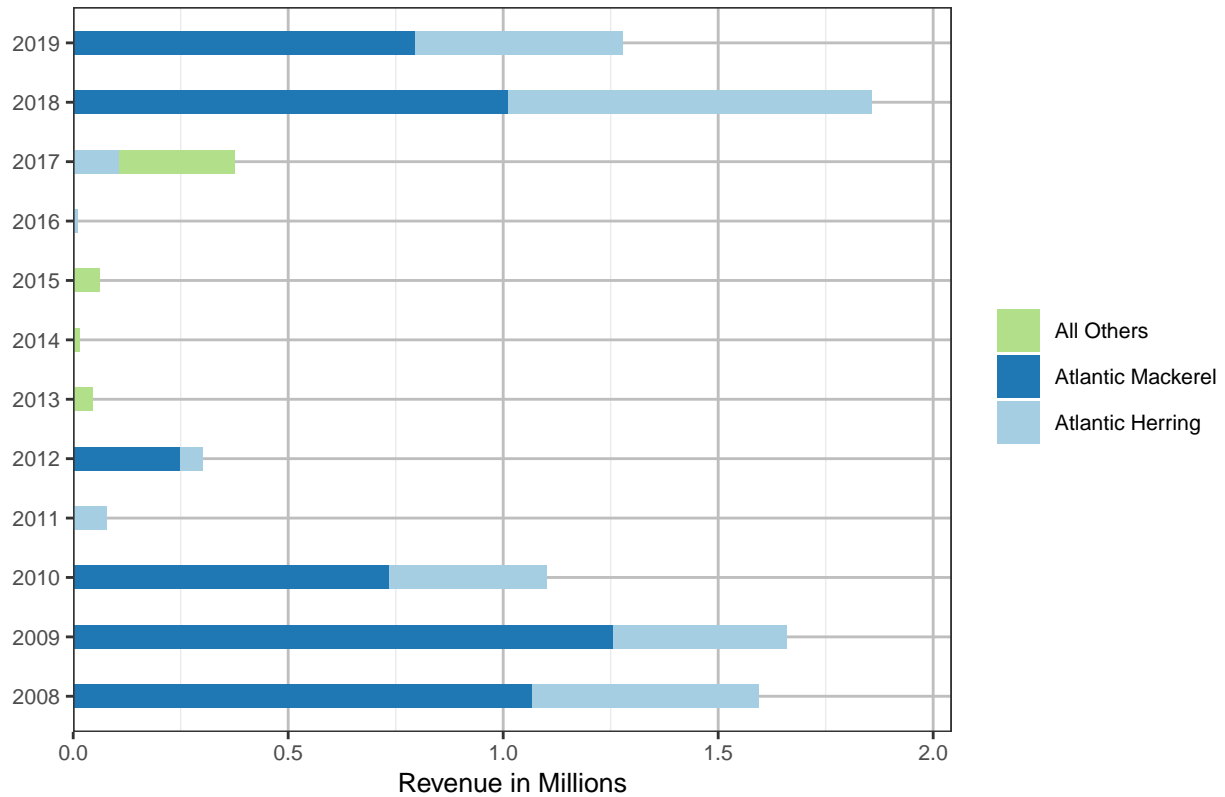


Table 8: Twelve Year Total Revenue, Most Impacted Species, RHS 4 NJ Merge

Species	Twelve Year Revenue
Atlantic Mackerel	\$5,108,000
Atlantic Herring	\$2,879,000
All Others	\$390,000
Total	\$8,377,000

Summary

Table 9: Most Impacted Species Twelve Year Revenue and Landings

Area	Twelve Year Revenue	Twelve Year Landings (Pounds)
RHS 1 NHMA Merge	\$ 7,835,000	58,315,000
RHS 2 Cape Merge	\$ 5,352,000	39,648,000
RHS 3 RI Merge	\$11,243,000	103,564,000
RHS 4 NJ Merge	\$ 8,377,000	61,908,000
Total	\$32,807,000	263,435,000

Totals

The following tables display the given year total revenue and total landed pounds of all species by all gear types within each area. RHS 3 RI Merge totals the most pounds landed, 103.594 million, and the most revenue derived from within an area, \$11.253 million. All numbers have been rounded to the nearest thousand.

Table 10: Twelve Year Total Revenue and Landings (Pounds), RHS
1 NHMA Merge

Year	Revenue	Landings
2008	\$1,785,000	14,453,000
2009	\$1,768,000	20,151,000
2010	\$1,283,000	11,169,000
2014	\$150,000	1,062,000
2015	\$99,000	586,000
2016	\$137,000	623,000
2017	\$1,363,000	5,977,000
2018	\$797,000	3,225,000
2019	\$467,000	1,104,000
All Others	<\$500	1,000
Total	\$7,848,000	58,352,000

Table 11: Twelve Year Total Revenue and Landings (Pounds), RHS
2 Cape Merge

Year	Revenue	Landings
2008	\$443,000	3,628,000
2010	\$35,000	347,000
2012	\$628,000	6,018,000
2013	\$576,000	4,091,000
2014	\$641,000	5,480,000
2015	\$958,000	8,756,000
2016	\$1,120,000	5,794,000
2017	\$385,000	2,670,000
2018	\$341,000	1,717,000
2019	\$160,000	553,000
All Others	\$65,000	596,000
Total	\$5,354,000	39,652,000

Table 12: Twelve Year Total Revenue and Landings (Pounds), RHS
3 RI Merge

Year	Revenue	Landings
2008	\$713,000	6,700,000
2009	\$1,950,000	17,097,000
2010	\$257,000	2,957,000
2011	\$414,000	3,485,000
2012	\$2,152,000	24,960,000
2013	\$1,536,000	14,486,000

Year	Revenue	Landings
2014	\$2,579,000	22,050,000
2015	\$935,000	6,917,000
2016	\$576,000	4,036,000
2017	\$85,000	595,000
All Others	\$55,000	310,000
Total	\$11,253,000	103,594,000

Table 13: Twelve Year Total Revenue and Landings (Pounds), RHS
4 NJ Merge

Year	Revenue	Landings
2008	\$1,597,000	15,703,000
2009	\$1,660,000	12,986,000
2010	\$1,102,000	9,609,000
2011	\$78,000	788,000
2012	\$351,000	2,019,000
2016	\$12,000	103,000
2017	\$378,000	2,063,000
2018	\$1,910,000	11,732,000
2019	\$1,279,000	6,270,000
All Others	\$121,000	981,000
Total	\$8,487,000	62,256,000

Table 14: Twelve Year Total Revenue and Landings, All Areas

Year	Revenue	Landings (Pounds)
2008	\$4,539,000	40,485,000
2009	\$5,377,000	50,234,000
2010	\$2,677,000	24,082,000
2011	\$492,000	4,273,000
2012	\$3,131,000	32,997,000
2013	\$2,113,000	18,577,000
2014	\$3,370,000	28,593,000
2015	\$1,993,000	16,260,000
2016	\$1,845,000	10,557,000
2017	\$2,211,000	11,305,000
2018	\$3,048,000	16,674,000
2019	\$1,906,000	7,928,000
All Others	\$240,000	1,889,000
Total	\$32,941,000	263,853,000

Revenue by Port

The ten most impacted (by revenue) ports are listed below. These ports are estimated to receive the most landings from fishing done within the River Herring and Shad areas. The table below displays each port's landings breakdown by area. Both tables present the cumulative revenues from 2008-2019. New Bedford receives the highest value of landings of any port, with \$11.331 million from 2008-2019. All numbers have been rounded to the nearest thousand.

Table 15: Most Impacted Ports, by Landings Revenues

City	State	Twelve Year Revenue
New Bedford	MA	\$11,331,000
Gloucester	MA	\$8,046,000
All Others		\$8,030,000
Portland	ME	\$2,659,000
Point Judith	RI	\$2,328,000
Fall River	MA	\$547,000

Table 16: Landings by Area

Port	Rhs 1 Nhma Merge	Rhs 2 Cape Merge	Rhs 3 Ri Merge	Rhs 4 Nj Merge
New Bedford, MA	\$976,000	\$1,135,000	\$6,446,000	\$2,774,000
Gloucester, MA	\$4,081,000	\$3,058,000	\$907,000	NA
All Others	\$881,000	\$179,000	\$1,572,000	\$5,398,000
Portland, ME	\$1,678,000	\$981,000	NA	NA
Point Judith, RI	NA	NA	\$2,328,000	NA
Fall River, MA	\$232,000	NA	NA	\$315,000

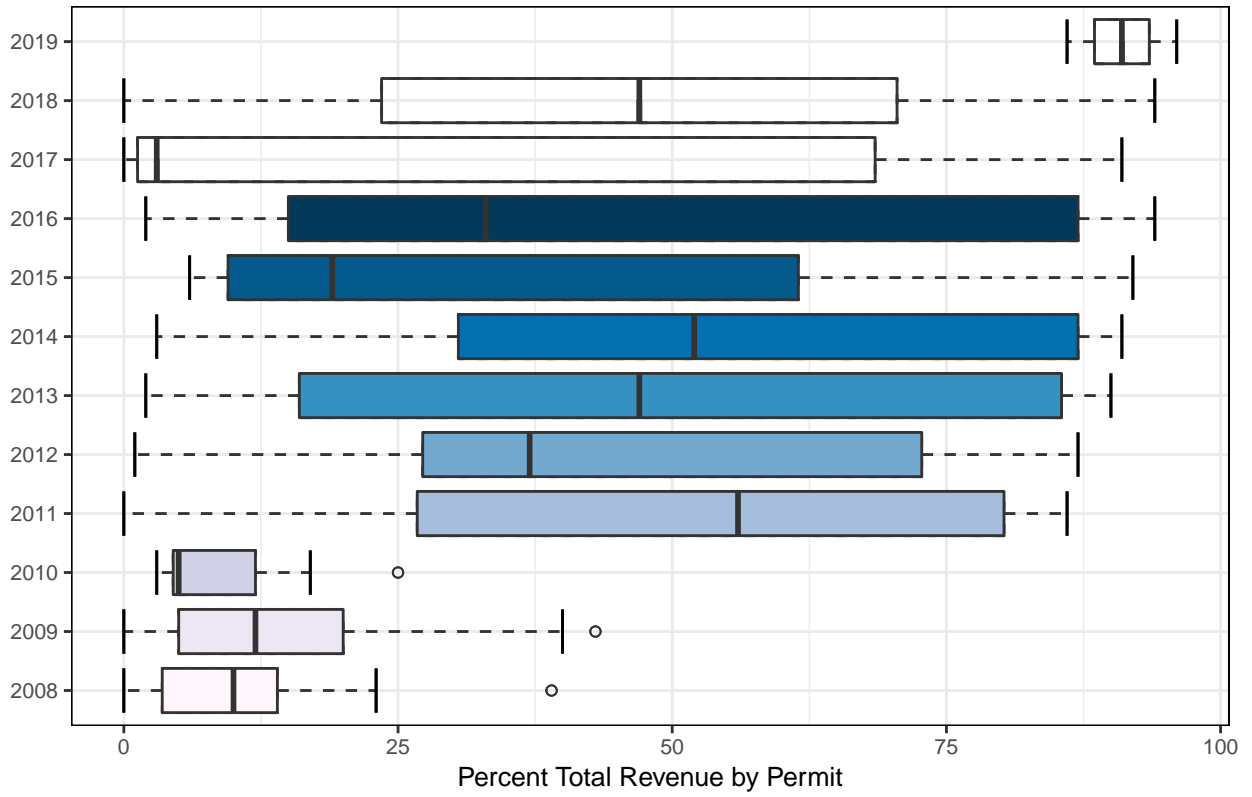
Percentage of Revenue by Permit

We also analyzed the percentage of each permit's total commercial fishing revenue coming from within the River Herring and Shad areas (see boxplots figures and tables below). Boxplots are important statistical summaries because they provide information about the distribution of the percentages. The boxplots below begin at the 1st quartile, or the value beneath which 25 percent of all observations fall. A thick line within the box identifies the median, the observation at which 50 percent of observations are above or beneath. The box ends at the 3rd quartile, or the observation beneath which 75 percent of observations fall.

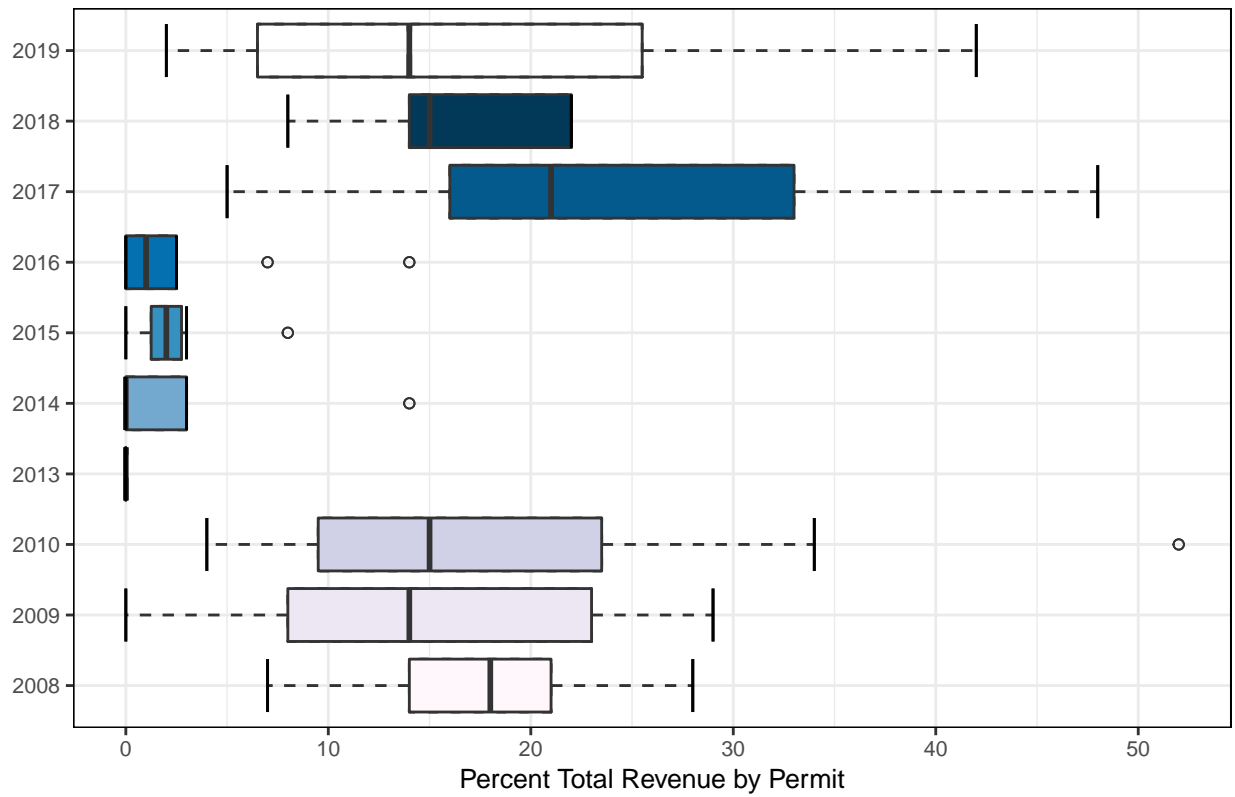
Nonparametric estimates of the minimum and maximum values are also indicated by the "whiskers" (dashed line terminating in a vertical line) that jut out from each side of the box. Any points outside of these whiskers are observations that are considered outliers. In our tables, however, the maximum values are inclusive of outliers. The table below presents the minimum, 1st quartile, median, 3rd quartile, and maximum values for each area. These are the twelve year revenue percentages. The boxplots in the figures below further separate each area out by year.

Area	Min	1st Quartile	Median	3rd Quartile	Max
Rhs 3 Ri Merge	0.61	7	18	32	91
Rhs 1 Nhma Merge	0.47	9	13	19	26
Rhs 4 Nj Merge	0	9	12	20	35
Rhs 2 Cape Merge	0	7	11	14	35

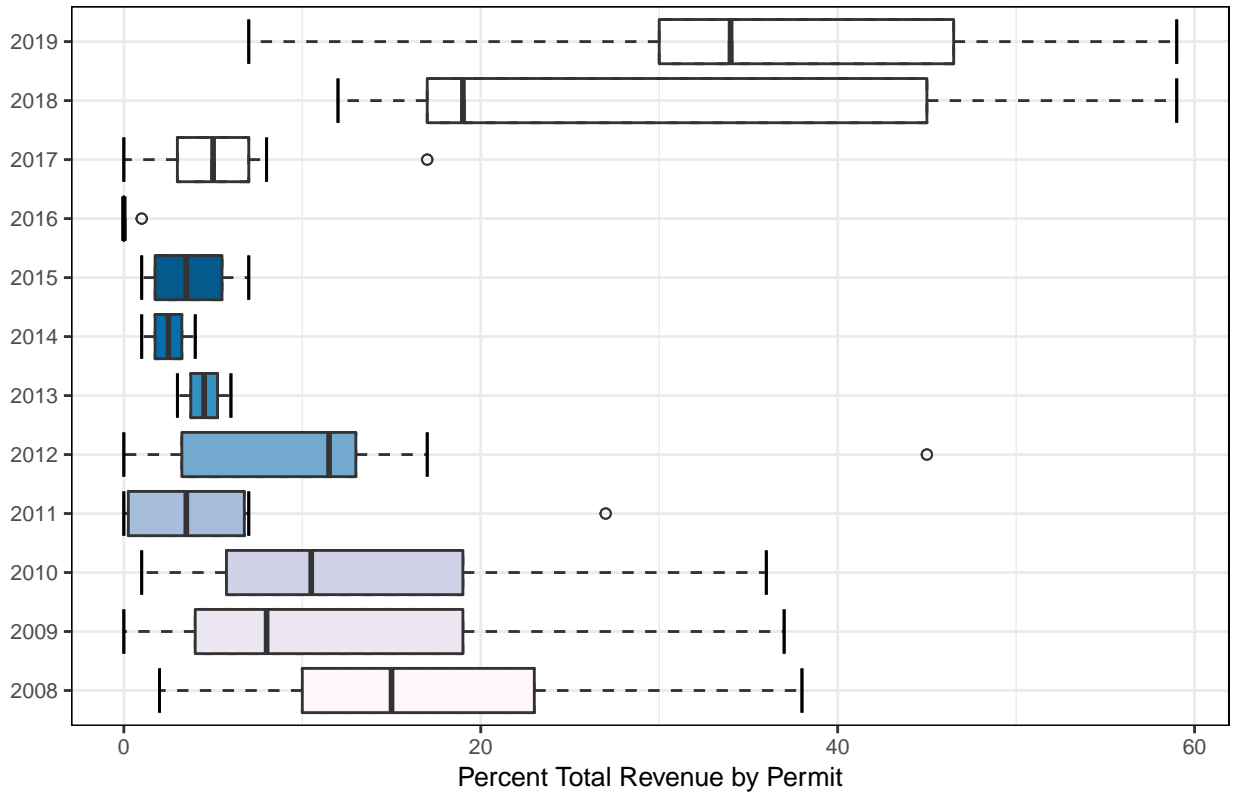
Annual Permit Revenue Percentage Boxplots, Rhs 3 Ri Merge



Annual Permit Revenue Percentage Boxplots, Rhs 1 Nhma Merge



Annual Permit Revenue Percentage Boxplots, Rhs 4 Nj Merge



Annual Permit Revenue Percentage Boxplots, Rhs 2 Cape Merge

