ESFPA Conservation Strategy
At-Sea Sample Report
LFA 32 and LFA 31 B: 2023

Quantifying At-sea samples completed by FSRS technicians in LFA 32 and 31 B in 2023

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for the Eastern Shore Fisherman's Protective Association (ESFPA)

Abstract

At-sea samples are completed annually by the Fishermen and Scientists Research Society (FSRS) technicians in LFA 32 and LFA 31 B for the Eastern Shore Fisherman's Protective Association (ESFPA). This report outlines the at-sea samples collected in spring 2023. A total of 22 trips were completed, including 7 trips in LFA 31 B and 15 trips in LFA 32. FSRS technicians entered trip data. Summaries of catch, lobster size distribution and total bycatch were compiled.

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Introduction

At-sea sampling as part of the ESFPA Conservation Strategy was conducted concurrently with the V-notching program. A total of 22 trips were completed by FSRS technicians for the ESFPA in the spring of 2023. Size distribution plots were completed for LFA 31 B and LFA 32, as well as for the ports sampled within these LFAs. Plots of bycatch were prepared for LFA 31 B and LFA 32.

Methods

At-sea samples were completed by FSRS technicians for the ESFPA in spring 2023. Data was recorded using the At Sea Sampling Protocol for American Lobster (Homarus americanus) and Associated Bycatch prepared by the Lobster Unit of the Department of Fisheries and Oceans (2019). This is a standardized protocol for lobster data collection from LFA 27 through LFA 38.

FSRS technicians contact volunteer captains who are members of the ESFPA to arrange sample trips. An FSRS technician accompanies the crew on a regular fishing day. FSRS technicians use 8" Vernier calipers and an 1m offset measuring board to measure all catch and bycatch caught on each trip. If possible, all catch is measured. If catch is high, traps may be skipped to avoid disrupting the regular fishing activity.

For each lobster caught, a variety of biological information is recorded. The lobster length, sex, berried state, and condition are noted. For berried female lobster, the clutch % coverage and egg stage are determined. In addition to condition, the presence of shell disease and v-notches are recorded. The standardized At-sea sample data sheet used by FSRS is included in APPENDIX A.

Results

Trip Summary

A total of 22 trips were completed, including 7 trips in LFA 31 B and 15 trips in LFA 32. Samples were completed in Three Fathom Harbour (4 trips), Owls Head (3 trips), Tangier (4 trips) Ecum Secum (4 trips), Marie Joseph (3 trips) and Liscomb (4 trips). Samples are completed every second week in each region to illustrate a more comprehensive collection of data in each region. One trip was cancelled and one trip delayed due to provincial wildfires. One trip was cancelled last minute at the end of the season due to boat trouble, with no opportunity to reschedule.

LFA 31B and LFA 32 lobster size and sex distribution

Table 1. Average, Min, and Max Carapace Length (CL) for LFA 31 B and LFA 32 in spring 2023.

CL (mm)	LFA 31B	LFA 32
Average	87	87
Min	50	47
Max	158	176

The average carapace length (CL) of lobster measured by FSRS technicians in spring 2023 in LFA 31 B and LFA 32 was 87 mm. For both LFAs most lobster measured were close to 80mm. The average carapace length (CL) of lobster measured by FSRS technicians in spring 2022 in LFA 31 B was 86 mm, and 85.5 mm in LFA 32.

In 2023, the minimum CL for 31B was 50mm and the maximum CL measured was 158mm (Table 1.) In 2023 for LFA 32 the minimum CL measured was 47mm and the maximum was a large female with a CL of 176mm (Table 1). This beautiful lobster was v-notched and returned on the spot, illustrating the value that fishers see in the v-notching program and the additional effort they contribute to the conservation of their fishery on a regular fishing day. In 2022, LFA 31 B, the minimum CL measured was 48 mm and the maximum CL measured was 160 mm. In LFA 32 in 2022, the minimum CL measured was 29 mm, and 155 mm was the maximum CL measured.

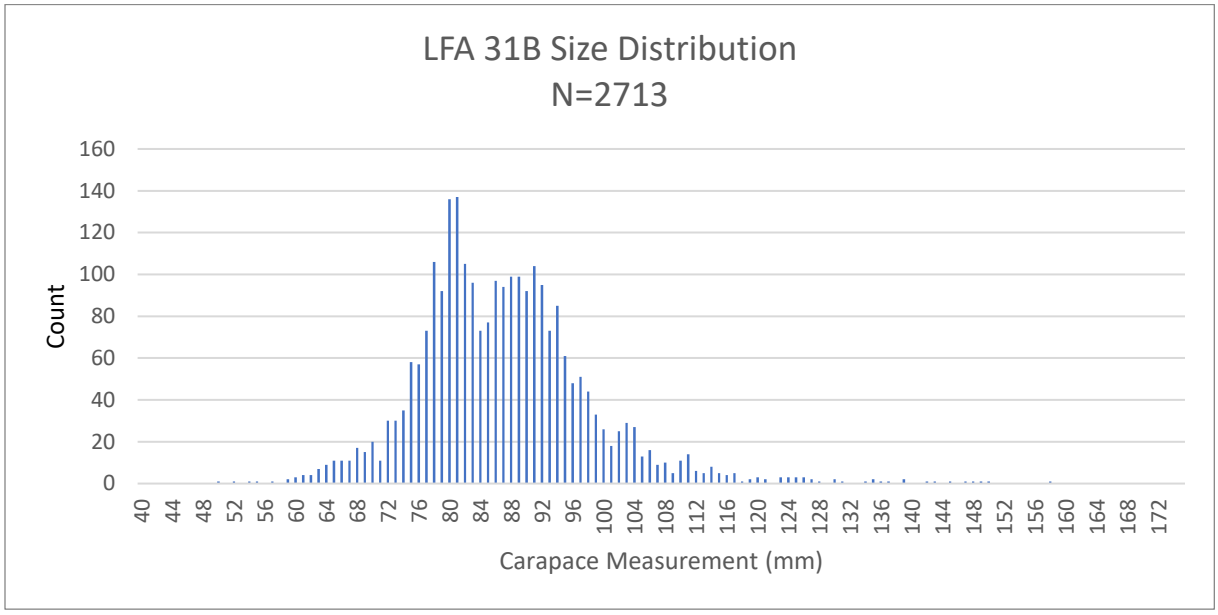

Figure 1. LFA 31 B lobster size distribution spring 2023. N= 3713 lobster.

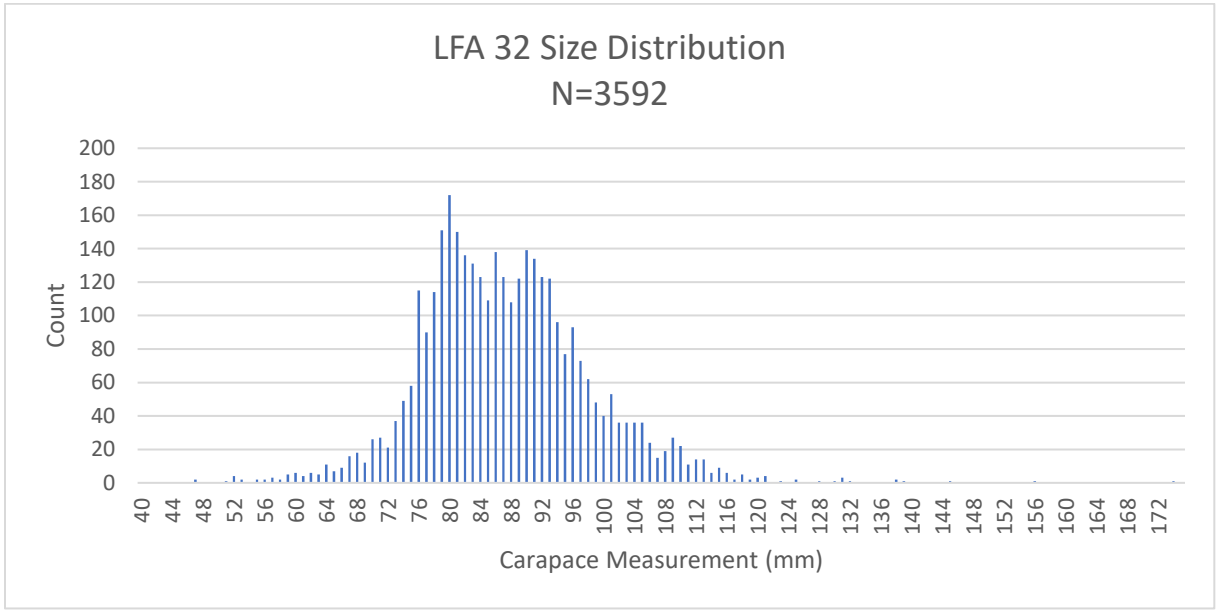

Figure 2. LFA 32 lobster size distribution spring 2023. N= 3592 lobster.

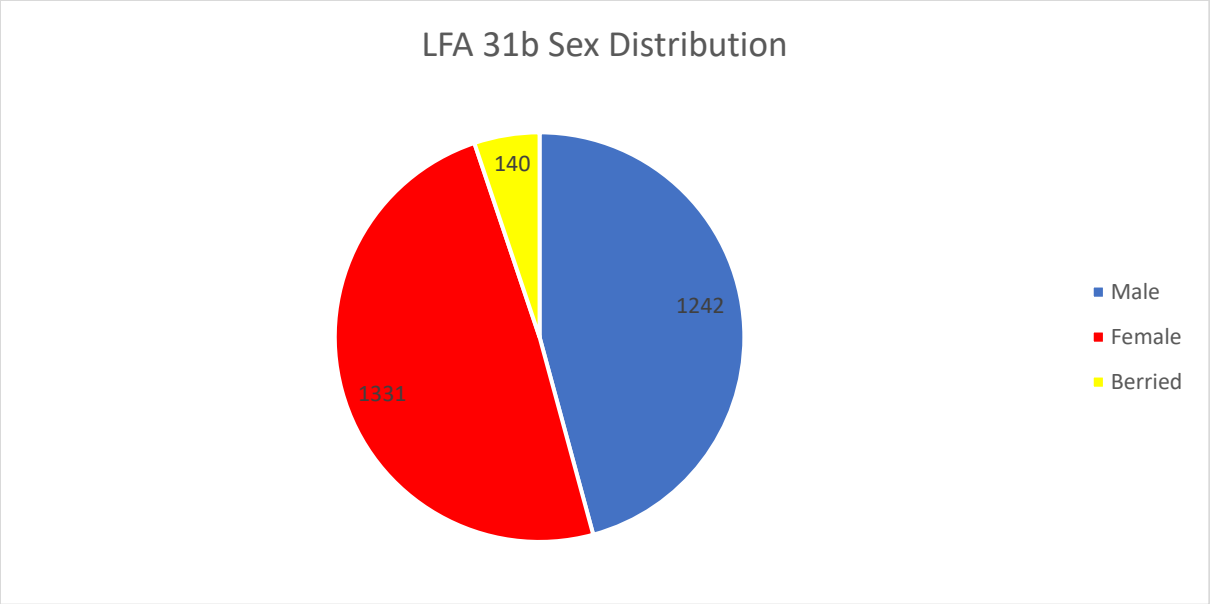

Figure 3. LFA 31B lobster sex distribution spring 2023. N= 2713 lobster.

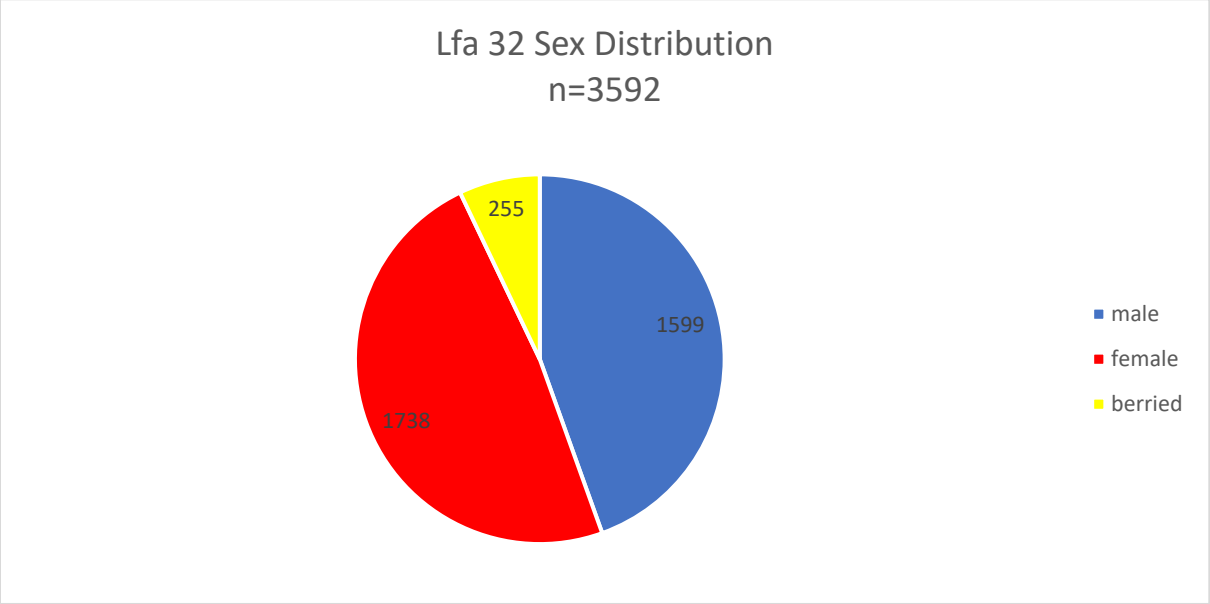

Figure 4. LFA 32 lobster sex distribution spring 2023. N= 3592 lobster.

A total of 2713 lobster were measured in LFA 31 B. A total 3592 of lobster were measured in LFA 32. 6305 lobster were measured in 2023 during ESFPA at-sea samples. Figure 1. illustrates the size distribution of lobster CL measured in LFA 31 B in spring 2023. Figure 2. Illustrates the size distribution of lobster CL measured in LFA 32 in spring 2023.

The average carapace length (CL) of lobster measured by FSRS technicians in spring 2023 in LFA 31 B and LFA 32 was 87 mm. For both LFAs most lobster measured were close to 80mm. The average carapace length (CL) of lobster measured by FSRS technicians in spring 2022 in LFA 31 B was 86 mm, and 85.5 mm in LFA 32. The lower average size lobster is attributed to higher numbers of sublegal sized lobster. LFA 31B shows a bimodal distribution with the most lobsters being clustered around 80mm and 90mm with a gap between them around 85mm and a decline on either side. Overall the lobsters sex was fairly evenly distributed with more females being caught than males (Figure 3., Figure 4.).

Lobster Size distribution by region

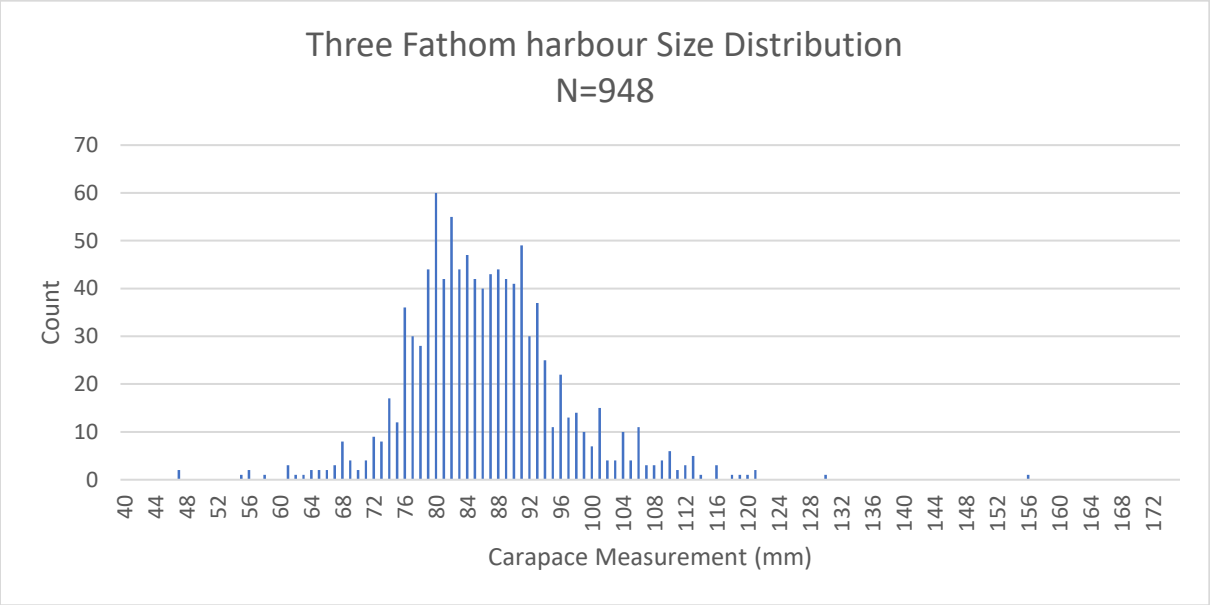

Figure 5. Three fathom harbour lobster size distribution 2023. N=948

Four trips are included in the lobster size distribution for Three Fathom Harbour in spring 2022 (Figure 3). A total of 948 lobster were measured in Three Fathom Harbour. The average CL of lobster in Three Fathom harbour was around 86 mm CL, with most lobster measuring close to 80mm CL. There was a second cluster of lobster around 90mm CL as well. Few lobster fell outside of the range of 75mm CL to 96mm CL. The smallest lobster measured was 47mm CL and the largest was 156 mm CL. Three fathom harbour had a relatively even sex distribution, with 458 males and 490 females measured.

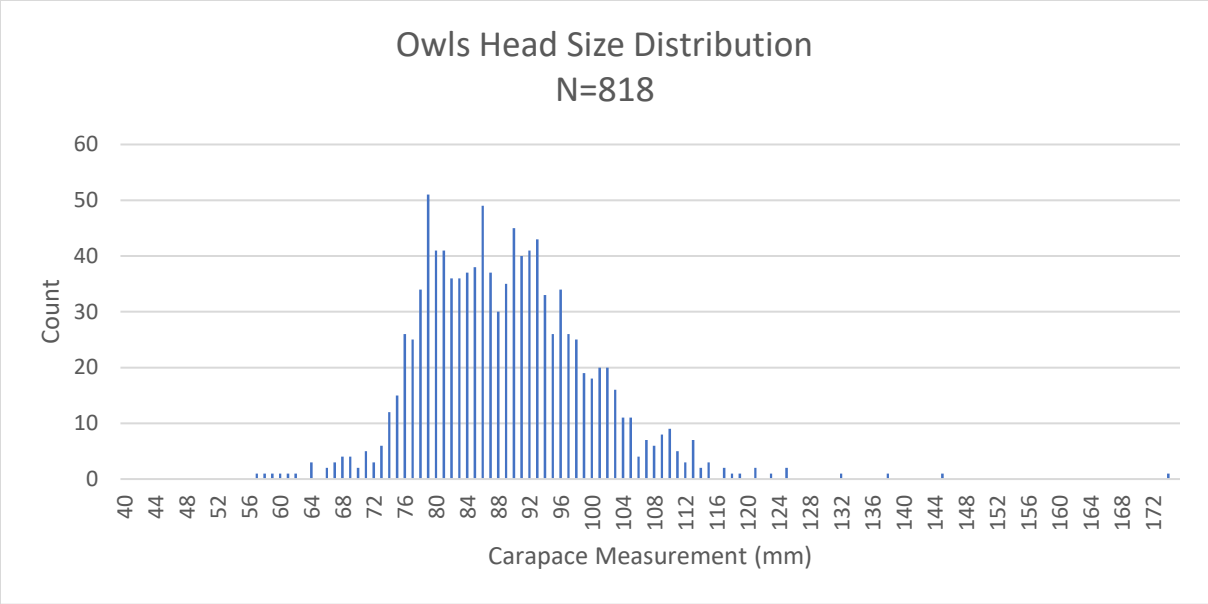

Figure 6. Owls Head lobster size distribution spring 2023. N=818

Three trips are compiled to illustrate the size distribution of lobster in Owls Head in spring 2023 (Figure 6). One trip was skipped due to the provincial wildfires. A total of 818 lobster were measured in Owls head. The average CL for lobster in Owls head was 88 mm CL, with most lobster falling around 85mm CL and 90mm CL. The smallest lobster measured in this area was 57mm and the largest was a 176mm female that was v-notched and released. This area had larger lobster than the other areas sampled. This area had the greatest number of females compared to males, and a lot of berried females.

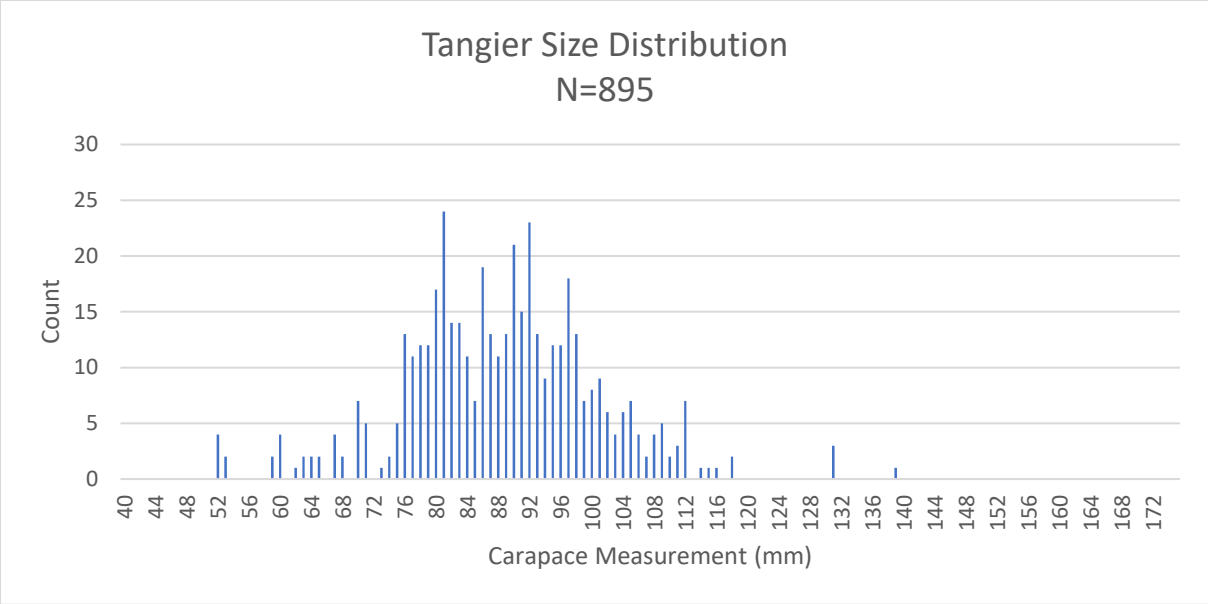

Figure 7. Tangier lobster size distribution spring 2023. N=895

Four trips are considered for the size distribution of lobster in Tangier in 2023 (Figure 7). A total of 895 lobster were measured, with an average CL 89 mm in Tangier. Tangier showed a bimodal distribution with lobster clustered around 80mm CL and 90mm CL. The largest lobster measured was 139mm CL, while the smallest measured was 52mm CL. There were more female than male lobster measured in Tangier.

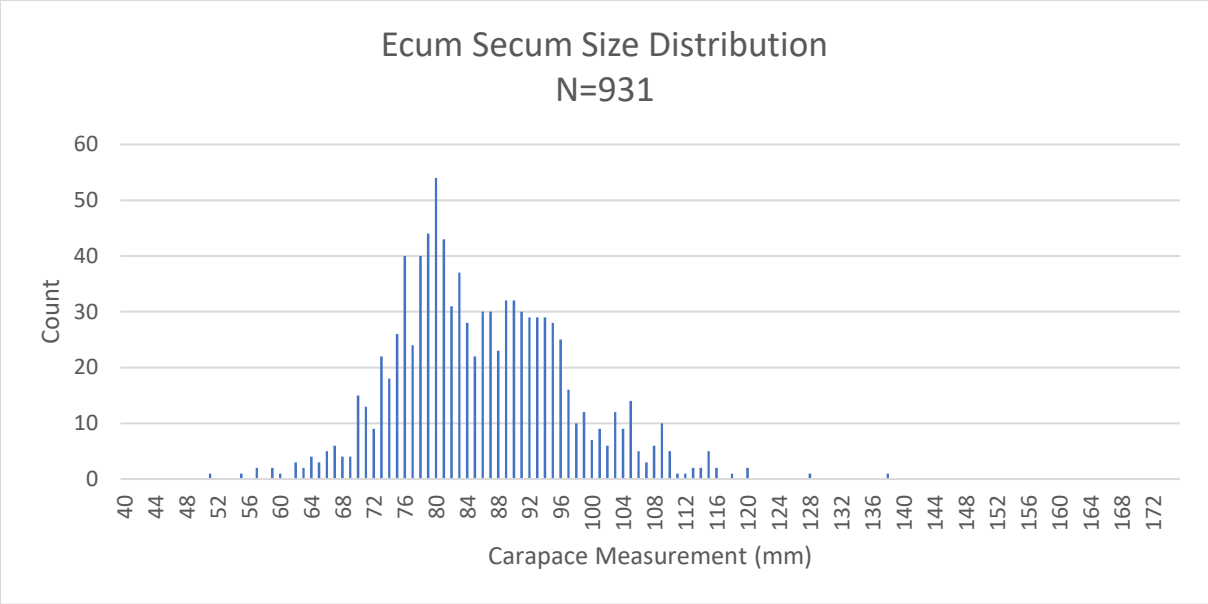

Figure 8. Ecum Secum lobster size distribution spring 2023. N=931

Four trips are included in the size distribution of lobster for Ecum Secum in spring 2023 (Figure 8). A total of 931 lobster were measured, with an average CL of 86 mm. The majority of lobster measured had a CL close to 80mm, with Ecum Secum showing mostly smaller lobster when compared with other areas, and fewer larger lobster. The smallest lobster measured in this area was 51mm CL while the largest measured 138 mm CL. The sex distribution in Ecum Secum was more evenly distributed, with slightly more females than males.

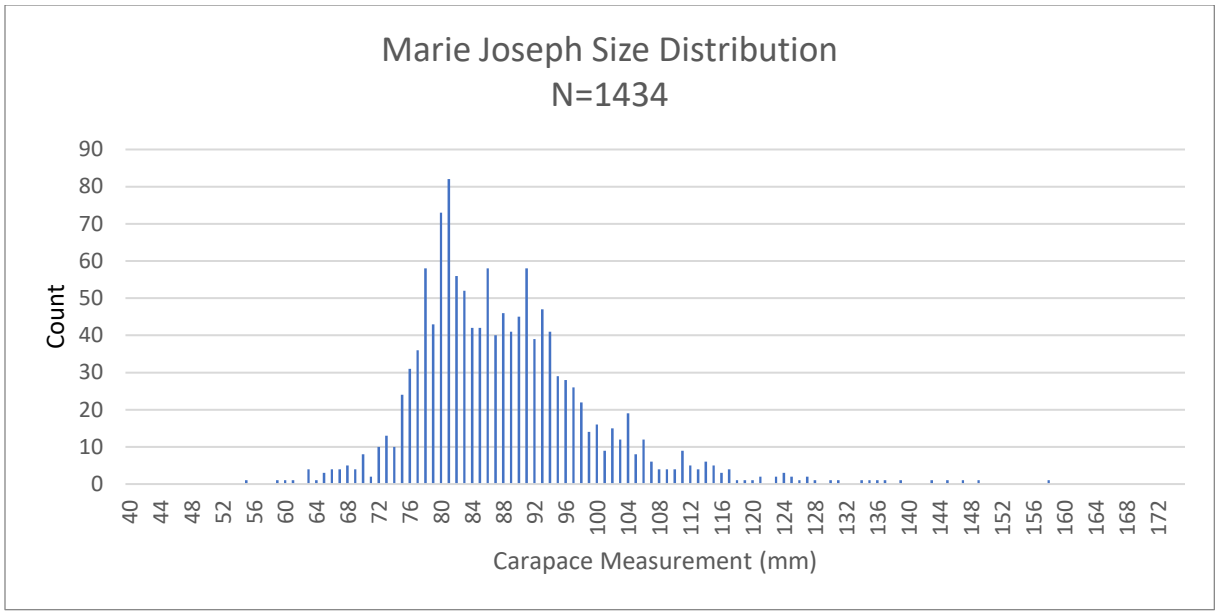

Figure 9. Marie Joseph lobster size distribution spring 2023 N= 1434.

Three trips were completed in Marie Joseph, with one trip delayed due to the provincial wildfires. Marie Joseph's average CL was 88mm, with most lobster measuring near 80mm carapace length. 1434 lobster were measured in Marie Joseph. The largest was 158mm CL and the smallest was 55mm CL. Interestingly, the above graph shows a very weak bimodal distribution unlike the strong one you can see from Liscomb, the closest wharf to Marie Joseph. There are still large lobster in this area, but they are offset by the highest number of undersize lobster in any area sampled. The majority of lobster in this area were female, however Marie Joseph and Liscomb saw more male lobster than other areas.

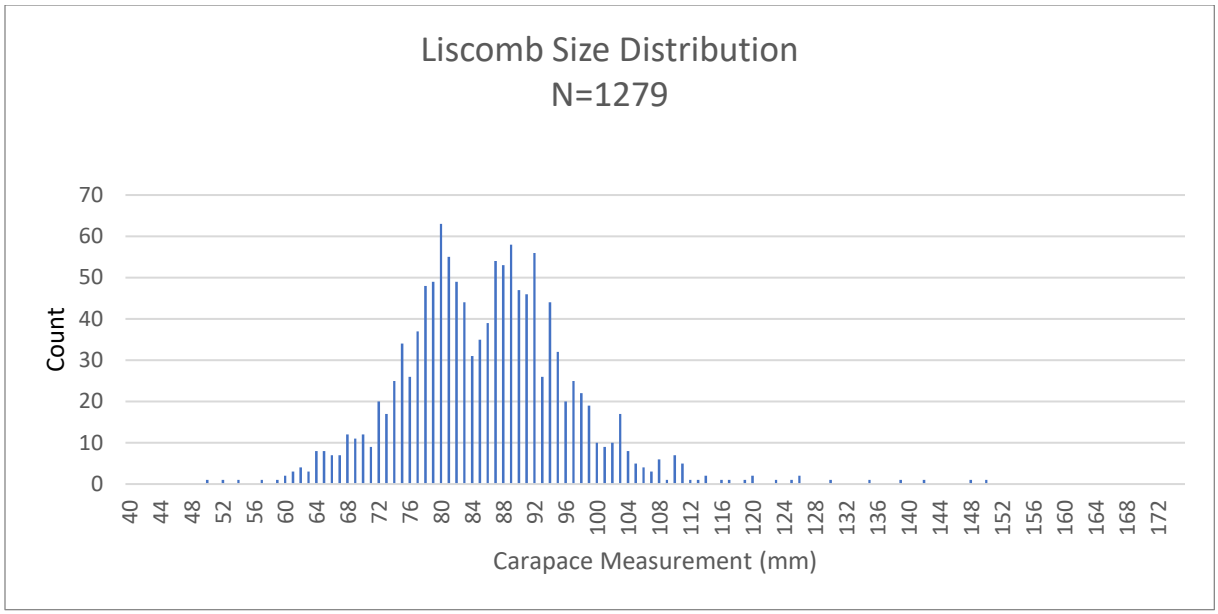

Figure 10. Liscomb lobster size distribution spring 2023. N=1279.

Four trips contributed to the size distribution of lobster in Liscomb in 2023 (Figure 8). A total of 1279 lobster were measured in Liscomb. The average CL measured in Liscomb was 86mm. Liscomb showed a bimodal size distribution, with peaks in distribution around 80mm and 90mm. Liscomb was the only area with more male lobster than female lobster, with 649 male and 630 female lobster.

Bycatch in LFA 31B and LFA 32

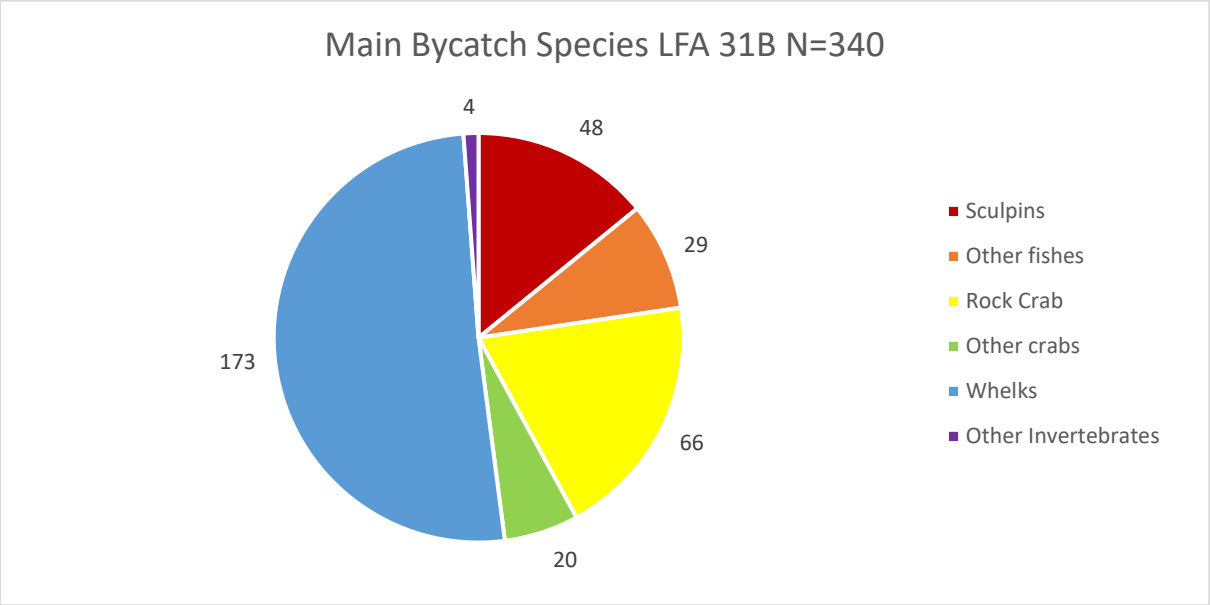

Figure 11. Main Bycatch Species in LFA 31B, Spring 2023

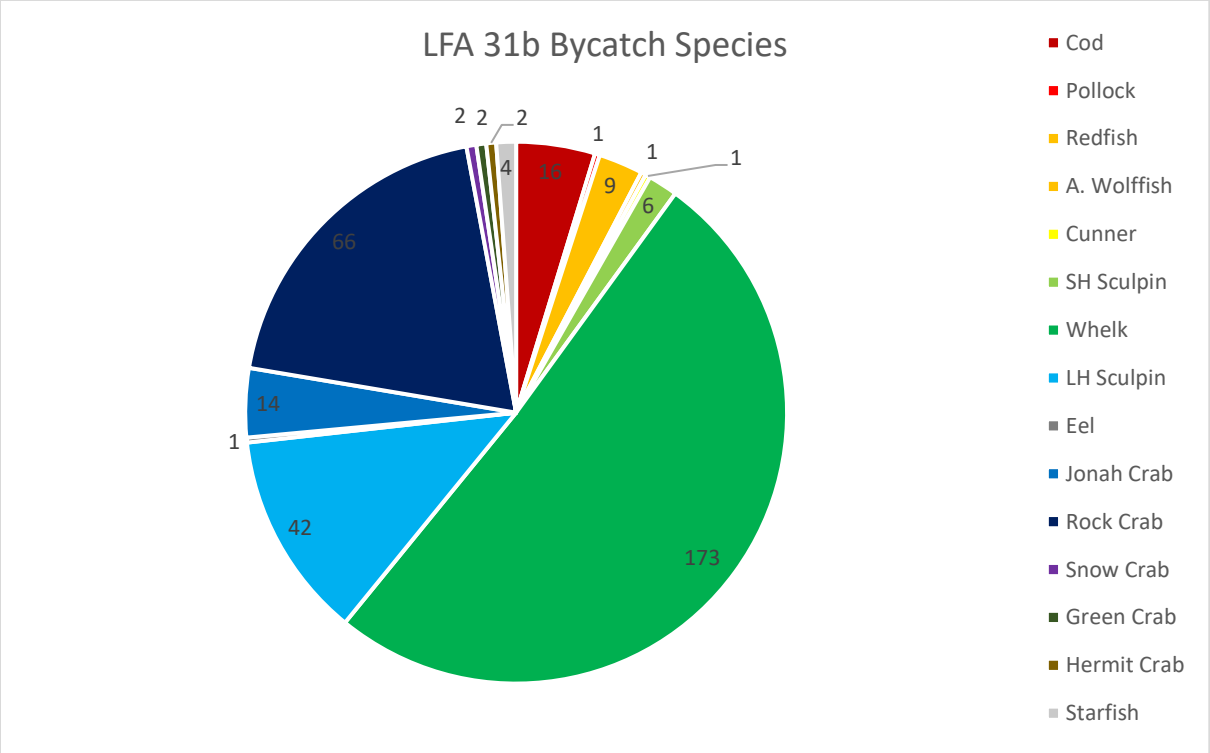

Figure 12. All bycatch species in LFA 31B, Spring 2023.

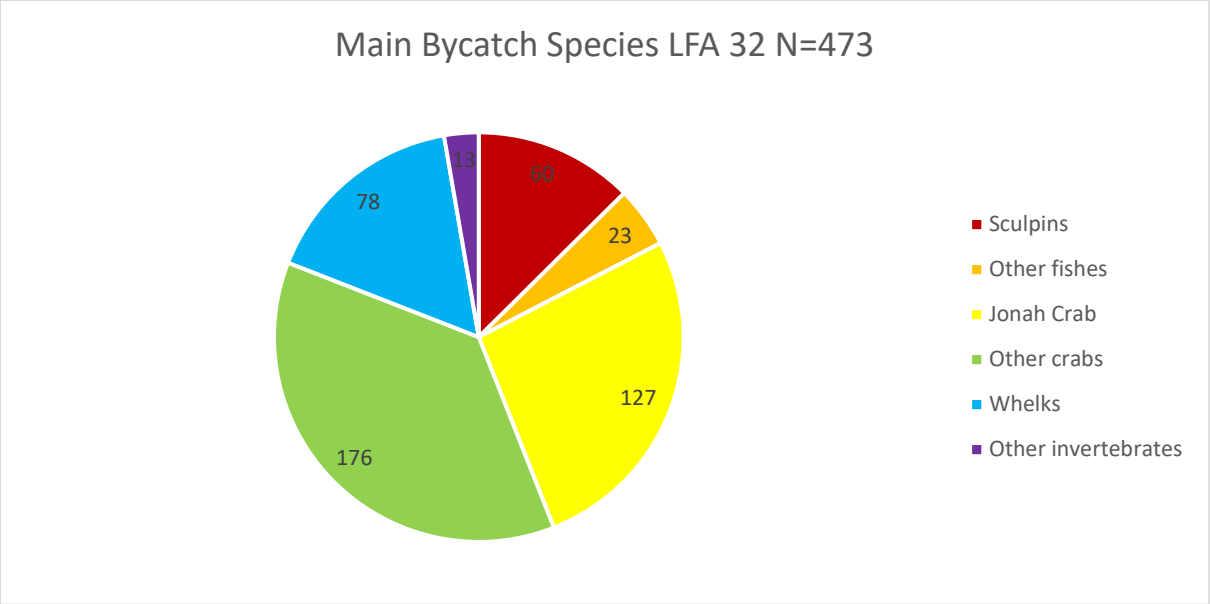

Figure 13. Main Bycatch Species in LFA 32, Spring 2023 N=473

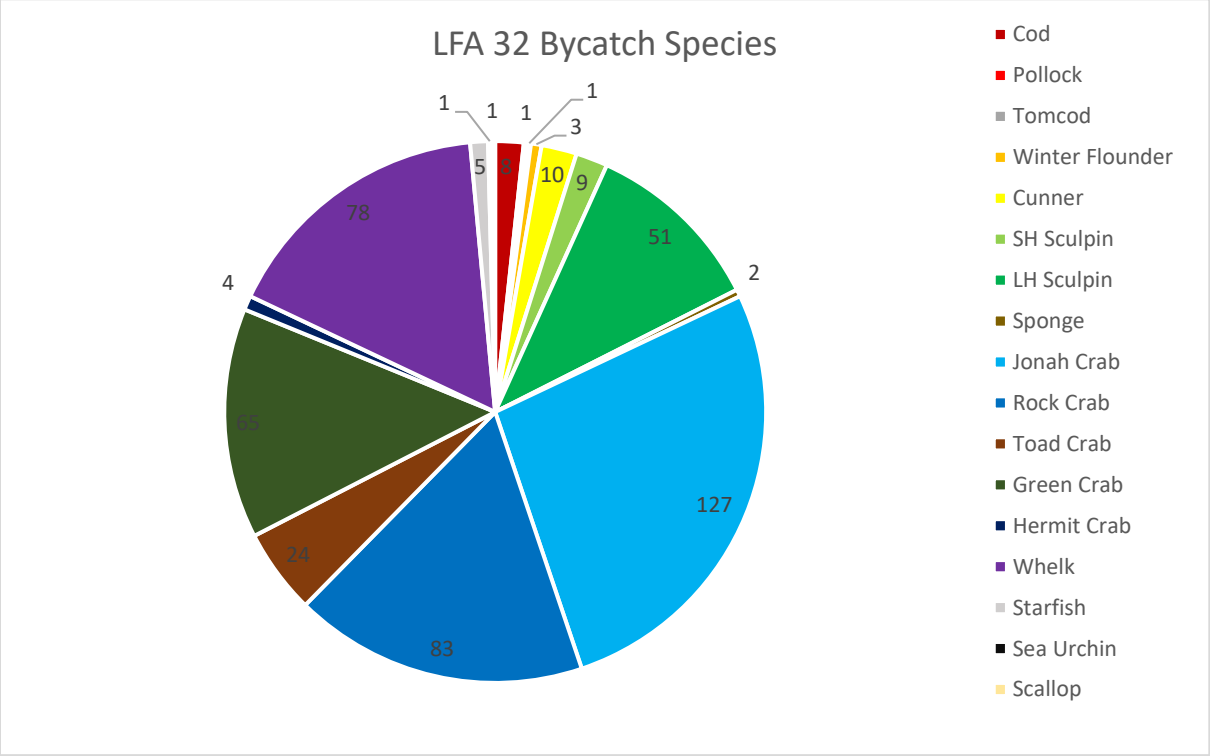

Figure 14. All bycatch species in LFA 32, Spring 2023.

Whelk were the most abundant bycatch species in LFA 31B (Figure 11). Crabs as a whole were the second most abundant form of bycatch, with the majority being rock crab (Figure 11). Green crab were significantly less prevalent in LFA 31B than LFA 32. Sculpins, specifically the shorthorn sculpin were the most abundant finfish bycatch in LFA 31B (Figure 11.). More cod were observed this year than last year.

Figure 11 shows abundance of bycatch species grouped into main bycatch species caught in LFA 31B. Figure 12 illustrates the complete breakdown of bycatch by species for LFA 31B.

Crabs were the most abundant form of bycatch in LFA 32, 2023 (Figure 13). There were more Jonah Crab, Green crab and Toad crabs caught as bycatch in LFA 32 than in LFA 31B (Figure 12, Figure 14). Short horned sculpin was the most abundant finfish caught as bycatch in LFA 32 and LFA 31B (Figure 13). Whelks are the most abundant of the miscellaneous invertebrates (excluding crabs) (Figure 13). Fewer cod were caught in LFA 32 than in LFA 31B.

Figure 13 shows abundance of bycatch species grouped into main bycatch species caught in LFA 32. Figure 14 illustrates the complete breakdown of bycatch by species for LFA 32.

Acknowledgements

We would like to acknowledge the ESFPA for taking initiative and conducting conservation research with their members. The success of the v-notching and at-sea samples conducted by the ESFPA as a part of their conservation strategy, in addition to their other projects, are a reflection of the dedication of their members and their leadership to the sustainability of their fisheries.

We would also like to thank the Captains and crew of the vessels that allow the FSRS technicians to accompany them for At-sea samples. Without them, we would not be able to complete this work. The relationship between fishers and scientists that is developed through this partnership is irreplaceable, and gives a unique opportunity for FSRS technicians to learn in the field from fish harvesters, who are local knowledge experts.

Finally we would like to acknowledge the FSRS technicians who balanced completing v-notching appointments and at-sea samples. Each of our technicians embraced these projects, completing 23 at-sea samples and 45 v-notching appointments.

APPENDIX A

*Edited by Cheryl Denton. Dec.4/**18 Added** GPS WAYPOINT*

At-Sea Sampling Data Form

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Trip Information

Trip # ☐☐☐☐☐☐-☐☐☐☐☐☐ (*VRN* – *DDMMY*) | Boarding Date _____ - _____ - _____ (DD MM YYYY) | Landing Date _____ - _____ - _____ (DD MM YYYY) | LFA _____

Vessel Name _____ | Vessel Reg # ☐☐☐☐☐☐ | Licence # ☐☐☐☐☐☐

Captain _____ Sampler _____

String / Trawl Information

STRING /TRAWL #				
# TRAPS IN STRING/TRAWL				
GPS WAYPOINT				
LATITUDE DDMM.MM				
LONGITUDE DDMM.MM				
GRID #				
DEPTH (FM)				
SOAKDAYS				
TRAP TYPE				
ESCAPE VENT SIZE				

Sample Information

	TRAWL #	TRAP #	BAIT CODE	BAIT TYPE	SPECIES CODE	LENGTH	SEX	SHELL HARDNESS	CONDITION	SHELL DISEASE	EGG	CLUTCH %	VNOTCH	KEPT	ABUNDANCE
1															
2															
3															
4															
5															
6															
7															
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