

**Species Size Compositions from the NMFS/Industry Survey Trawl Study
Conducted by the *R/V Albatross IV* and *F/V Sea Breeze*
28 October-6 November, 2002**

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Introduction

A cooperative NMFS/Industry Survey Trawl Study was conducted on the *R/V Albatross IV* and the *F/V Sea Breeze* during 28 October-6 November 2002. The objectives were to examine differences in catch by the *R/V Albatross IV* using Yankee #36 trawls in two configurations: 1) an “optimal” (OPT) configuration in which the gear conformed to standard specifications, and 2) a “worst case scenario” (WCS) configuration using a net (Trawl #14) that had been used during a previous survey, trawl doors thought to be performing poorly (Door Pair #37), backstraps twisted twice with no swivels, and trawl warps offset to match mis-marked warps during Northeast Fisheries Science Center (NEFSC) bottom trawl surveys during 2000-2002. The *F/V Sea Breeze*, using standard industry fishing gear, fished alongside the *R/V Albatross IV* on as many tows as possible, however, the *F/V Sea Breeze* made fewer tows due to limited staff on board.

Differences between the survey and commercial bottom trawls in design are important because they may affect the length of fish caught. The *F/V Sea Breeze* used a larger bottom trawl than the *R/V Albatross IV*, with longer groundcable, higher headrope, and larger, 6 inch mesh with 2.4 inch codend liner. The *F/V Sea Breeze* used a 30 fm ground cable in Area 1 and a 50 fm ground cable in Areas 2 and 3. Both Yankee #36 trawls used 5 inch mesh in the body with ½ inch codend liners.

A random block experimental design was used for OPT and WCS tows, ensuring that one tow of each type was conducted in the same area, under similar tidal conditions, and at roughly the same time during two sequential days. All fish and most invertebrates taken by the *R/V Albatross IV* were weighed, counted, and measured to the nearest cm. Aboard the *F/V Sea Breeze*, catches were also sorted and weighed with numbers caught and length data recorded if time allowed.

Area	Average Depth (fm)	Albatross (OPT)	Albatross Sea Breeze	Albatross (WCS)	Albatross Sea Breeze
Area 1 -Northwest Closed Area I	81	10	8	10	9
Area 2 -East of Cape Cod	112	13	11	13	13
Area 3 -Northeast Closed Area I	51	13	11	13	9

For each species where adequate data from both vessels were available, numbers in each 1 cm length group in all the tows in an area, by vessel/gear configuration, were summed to get the total number of fish in each size group in the area. Graphs were constructed to facilitate visual comparison of lengths. No statistical analyses were carried out.

While graphs were made for every species and area combination with enough length data from the *F/V Sea Breeze* to make reasonable comparisons, in some cases (e.g. monkfish, barndoor skate), length data were compared when there was little data available because the species was of particular interest. Not all combinations of species and areas were analyzed. Availability of length data was a limiting factor because staff were limited on the *F/V Sea Breeze* and it was not practical to measure all species in all catches.

Results

In general, the size ranges of species caught by the OPT vs. WCS gear configurations on the *R/V Albatross IV* were comparable (Figures 1-21). This was also generally true in comparisons between the *R/V Albatross IV* and the *F/V Sea Breeze*. However, the *R/V Albatross IV* generally caught a wider range of lengths with more small fish than the *F/V Sea Breeze*. Differences in catch of small fish were due to the relatively fine $\frac{1}{2}$ in liner used as standard equipment in NEFSC bottom trawl surveys. There were a few notable exceptions from the general results however. For instance, the *F/V Sea Breeze* caught more large white hake (Figure 5) and witch flounder (Figure 15) in Area 2 than did either configuration of gear on the *R/V Albatross IV*. The *R/V Albatross IV* caught more large spiny dogfish in Area 2 (Figure 17) and little skate in Area 3 (Figure 18) than did the *F/V Sea Breeze*.

Figure 1. Length composition of Haddock from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A1G0) and worst case scenario net configurations (label A1G1). For this species, only stations 17 and 18 from the *R/V Albatross IV* had lengths sampled on the *F/V Sea Breeze*. For the *F/V Sea Breeze*, ‘Tows’ is the number of tows that the species was sampled for length data. N is the number of fish measured; ‘NW CA-I’ is Area 1 (Northwest Closed Area 1).

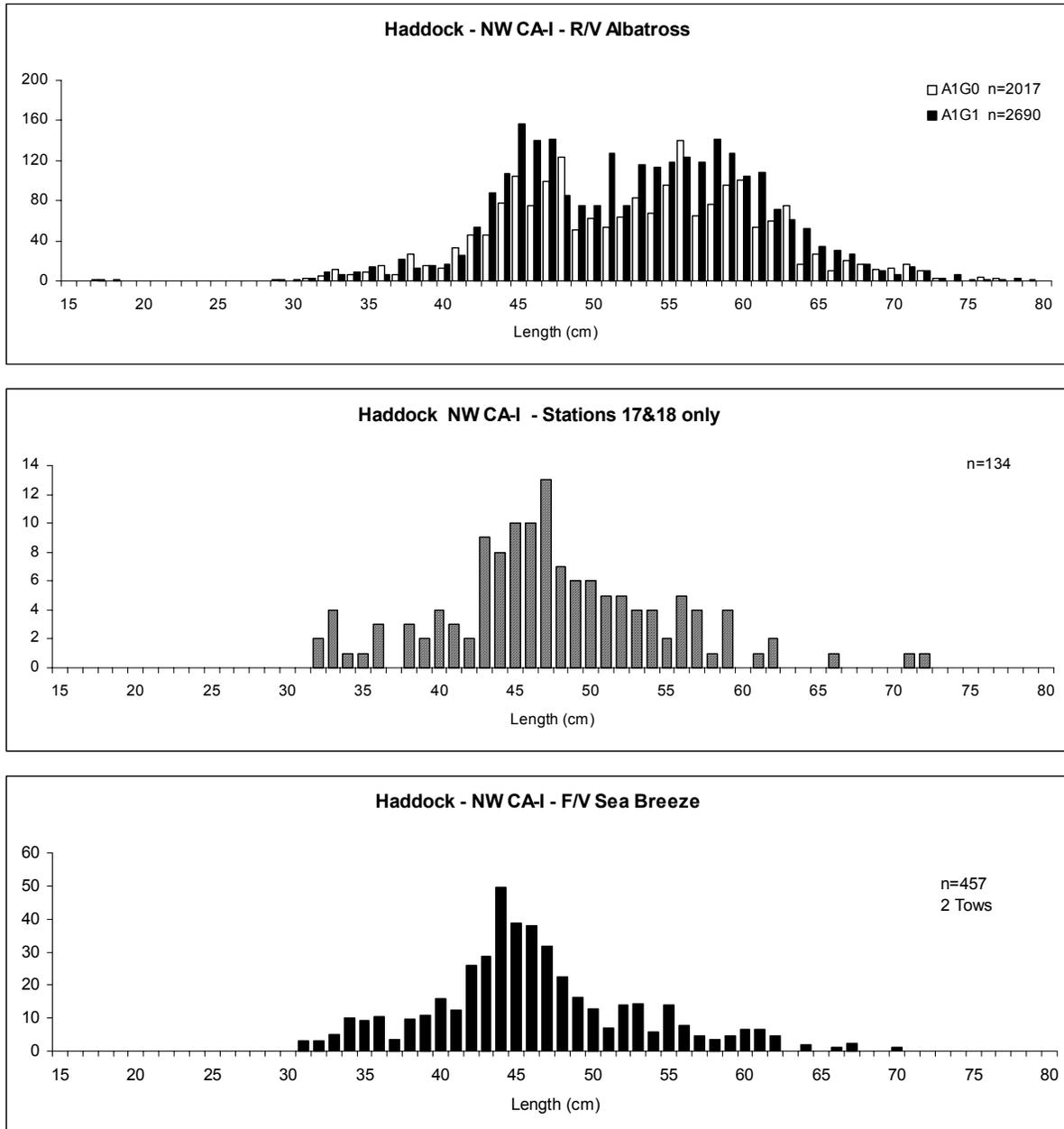


Figure 2. Length composition of Atlantic cod from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A1G0) and worst case scenario net configurations (label A1G1). For the *F/V Sea Breeze*, ‘Tows’ is the number of tows that the species was sampled for length data. N is the number of fish measured; ‘NW CA-1’ is Area 1 (Northwest Closed Area 1).

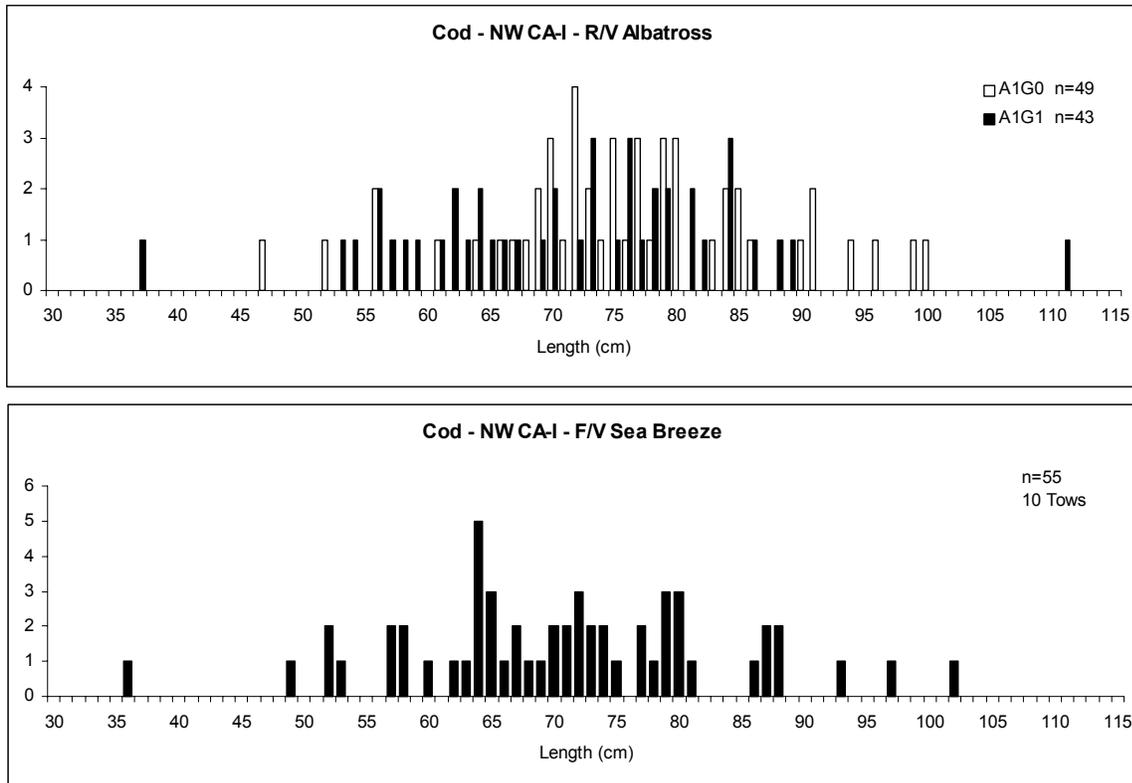


Figure 3. Length composition of Silver Hake from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A1G0) and worst case scenario net configurations (label A1G1). For the *F/V Sea Breeze*, ‘Tows’ is the number of tows that the species was sampled for length data. N is the number of fish measured; ‘NW CA-I’ is Area 1 (Northwest Closed Area 1).

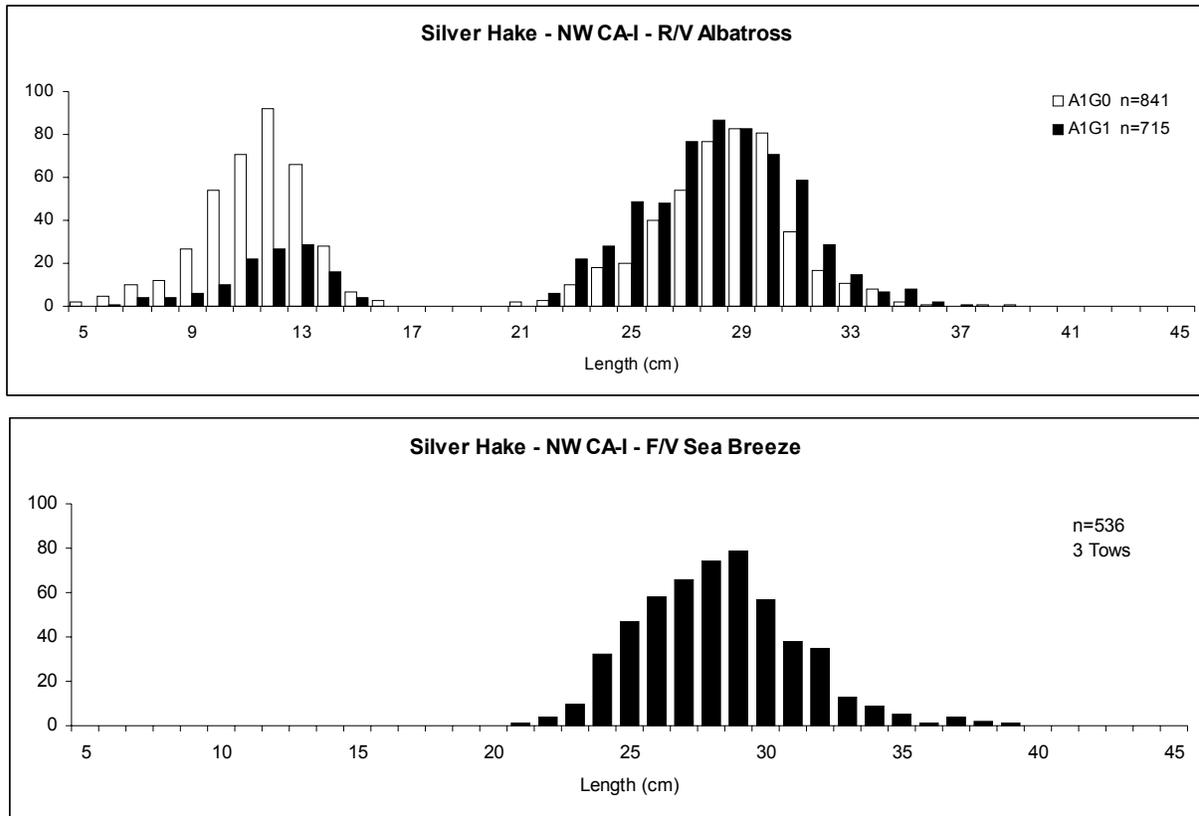


Figure 4. Length composition of Silver Hake from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A2G0) and worst case scenario net configurations (label A2G1). For the *F/V Sea Breeze*, ‘Tows’ is the number of tows that the species was sampled for length data. N is the number of fish measured; ‘East of Cape Cod’ is Area 2).

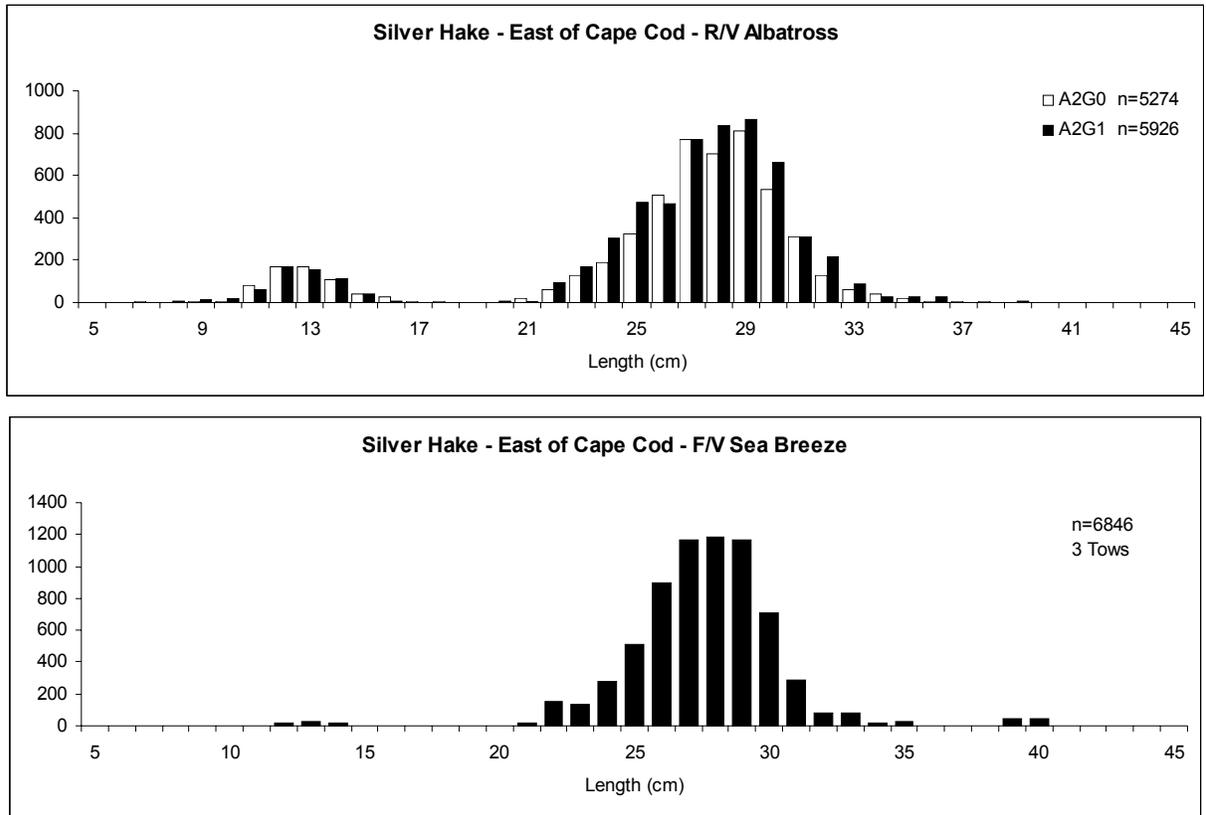


Figure 5. Length composition of White Hake from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A2G0) and worst case scenario net configurations (label A2G1). For the *F/V Sea Breeze*, ‘Tows’ is the number of tows that the species was sampled for length data. N is the number of fish measured; ‘East of Cape Cod’ is Area 2).

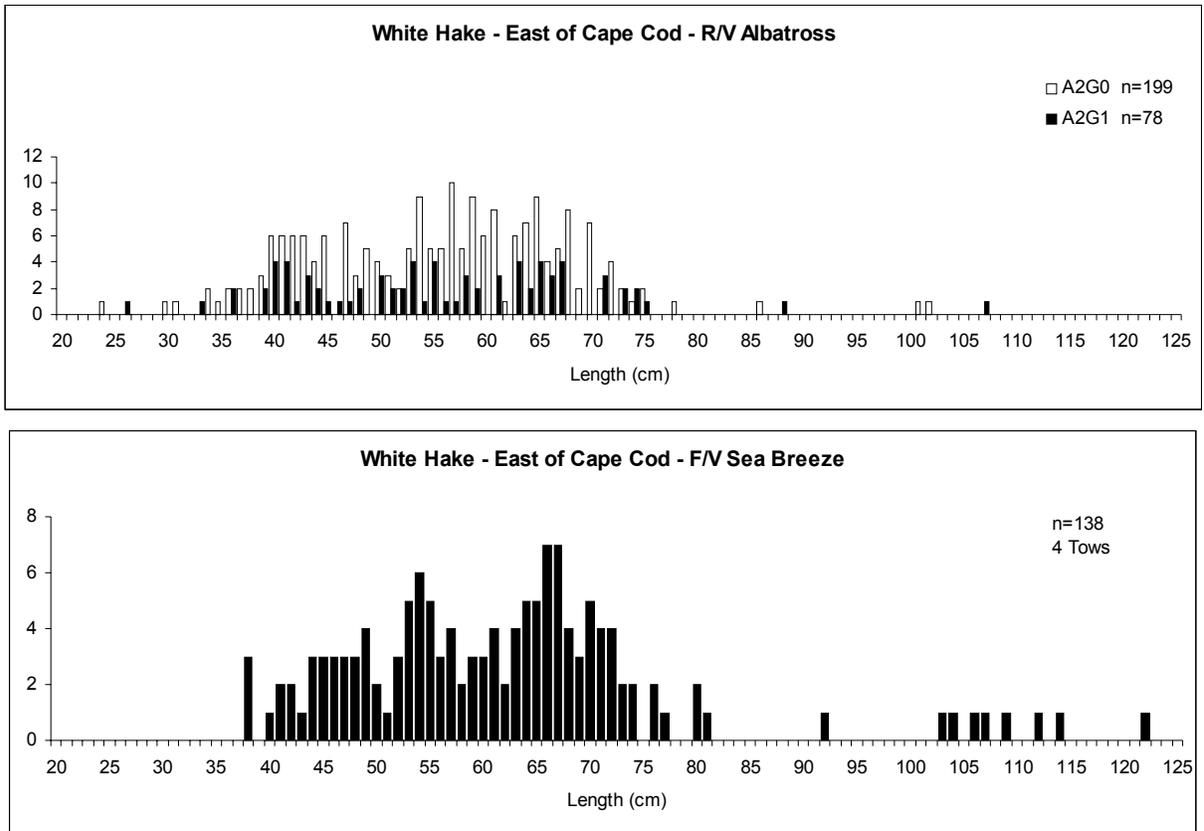


Figure 6. Length composition of Red Hake from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A2G0) and worst case scenario net configurations (label A2G1). For the *F/V Sea Breeze*, ‘Tows’ is the number of tows that the species was sampled for length data. N is the number of fish measured: ‘East of Cape Cod’ is Area 2).

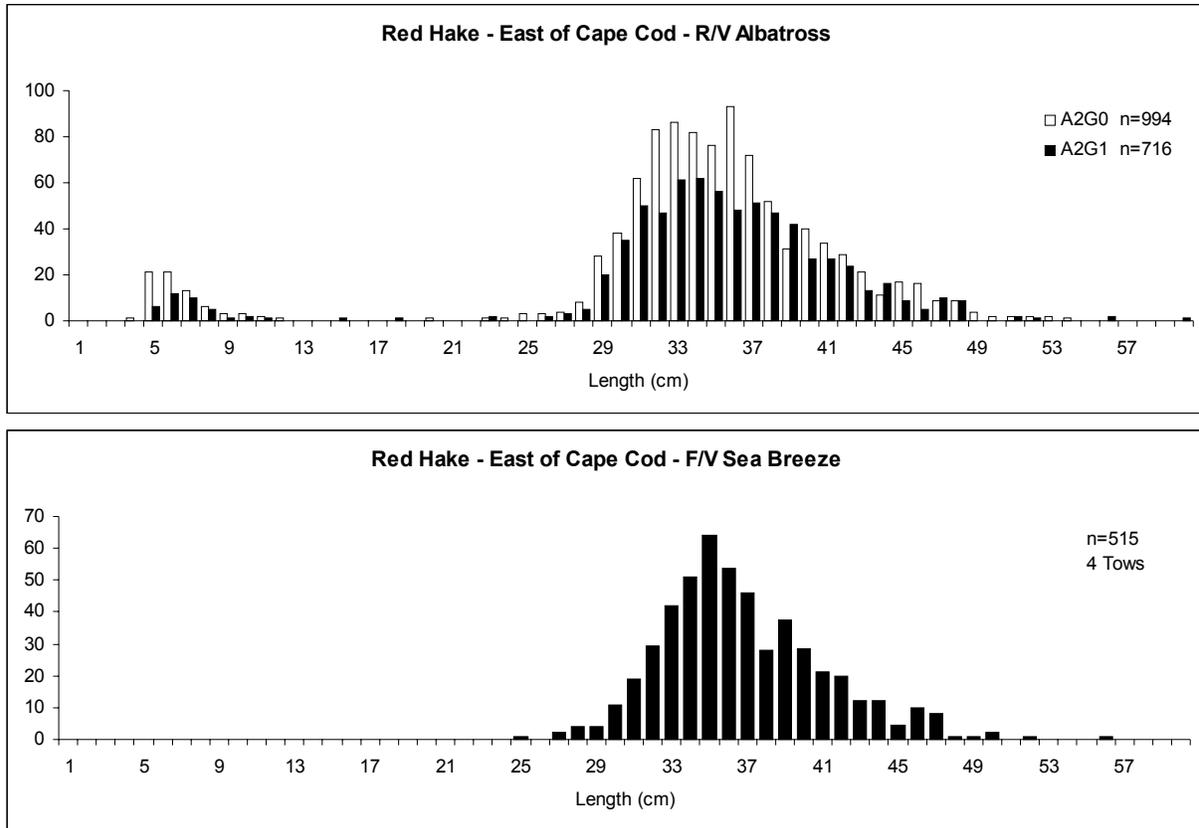


Figure 7. Length composition of Red Hake from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A3G0) and worst case scenario net configurations (label A3G1). For the *F/V Sea Breeze*, ‘Tows’ is the number of tows that the species was sampled for length data. N is the number of fish measured; ‘NE CA-I’ is Area 3 (Northeast Closed Area 1).

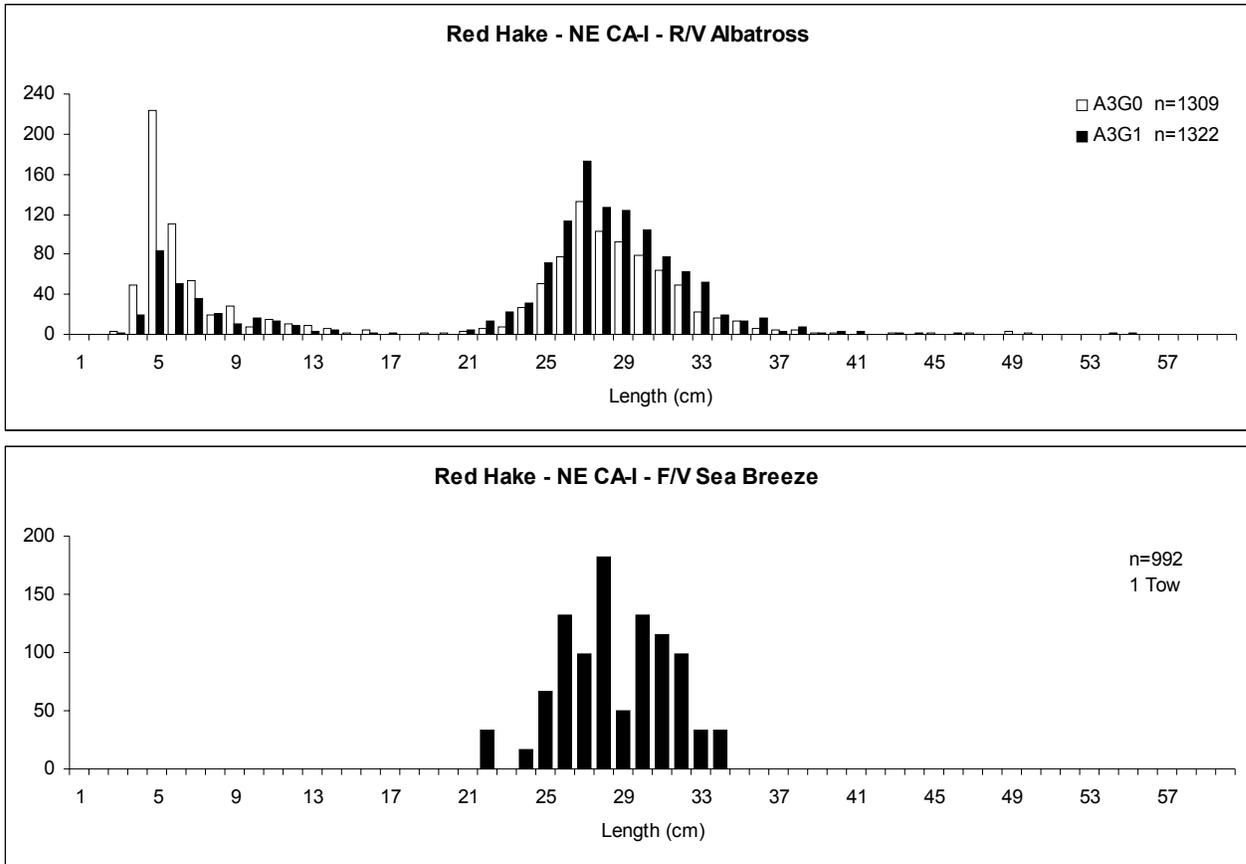


Figure 8. Length composition of Monkfish from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A1G0) and worst case scenario net configurations (label A1G1). For the *F/V Sea Breeze*, ‘Tows’ is the number of tows that the species was sampled for length data. N is the number of fish measured; ‘NW CA-I’ is Area 1 (Northwest Closed Area 1).

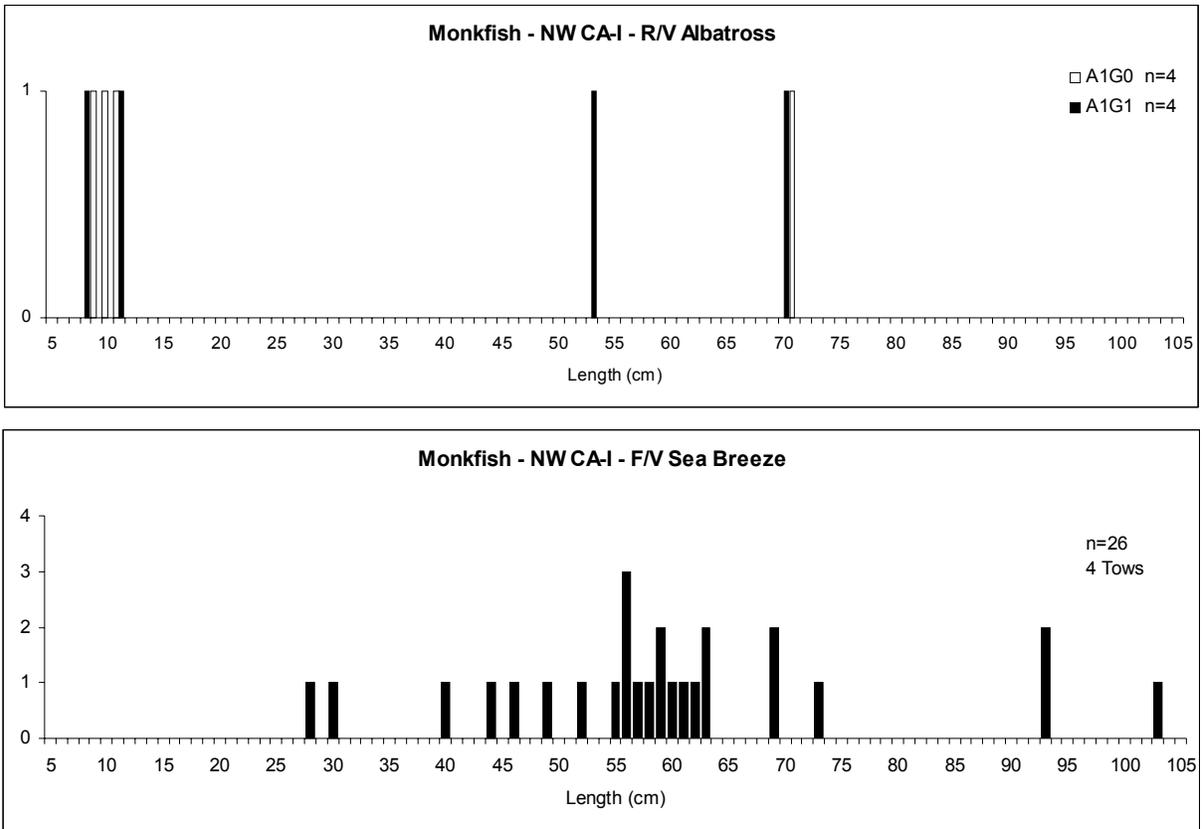


Figure 9. Length composition of Monkfish from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A2G0) and worst case scenario net configurations (label A2G1). For the *F/V Sea Breeze*, ‘Tows’ is the number of tows that the species was sampled for length data. N is the number of fish measured; ‘East of Cape Cod’ is Area 2.

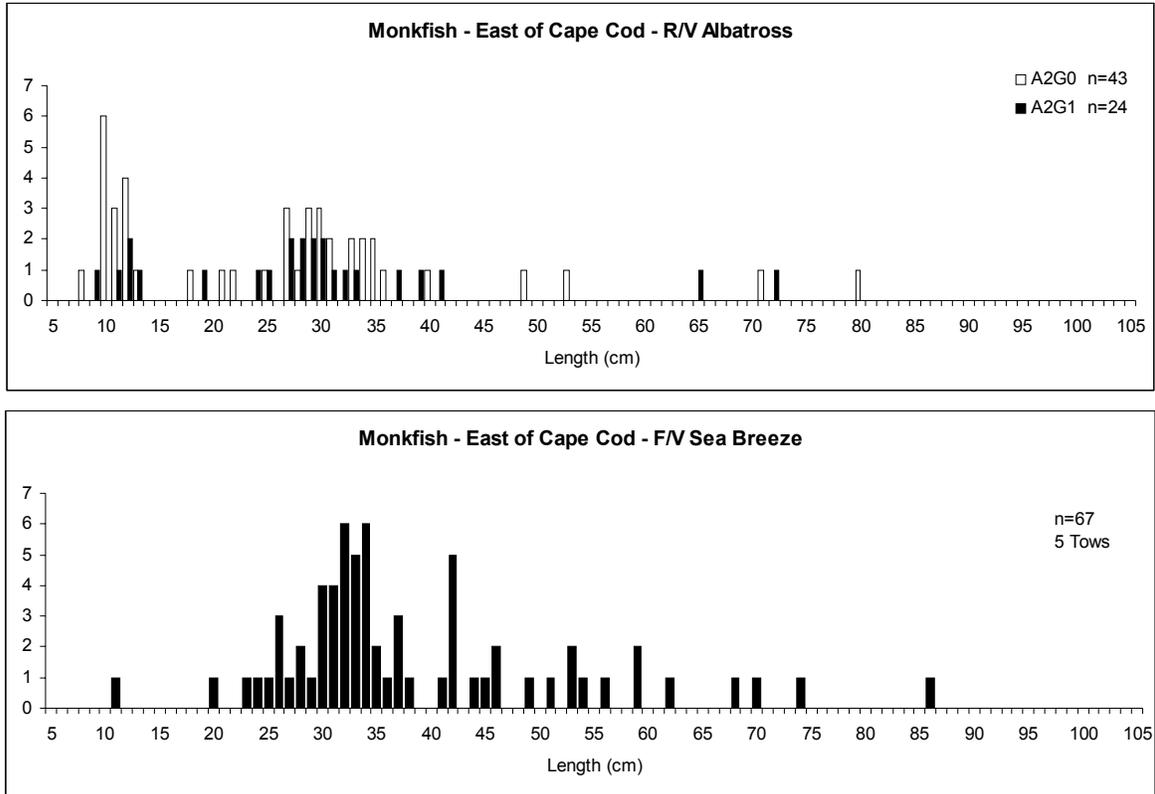


Figure 10. Length composition of Monkfish from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A3G0) and worst case scenario net configurations (label A3G1). For the *F/V Sea Breeze*, ‘Tows’ is the number of tows that the species was sampled for length data. N is the number of fish measured; ‘NE CA-I’ is Area 3 (Northeast Closed Area 1).

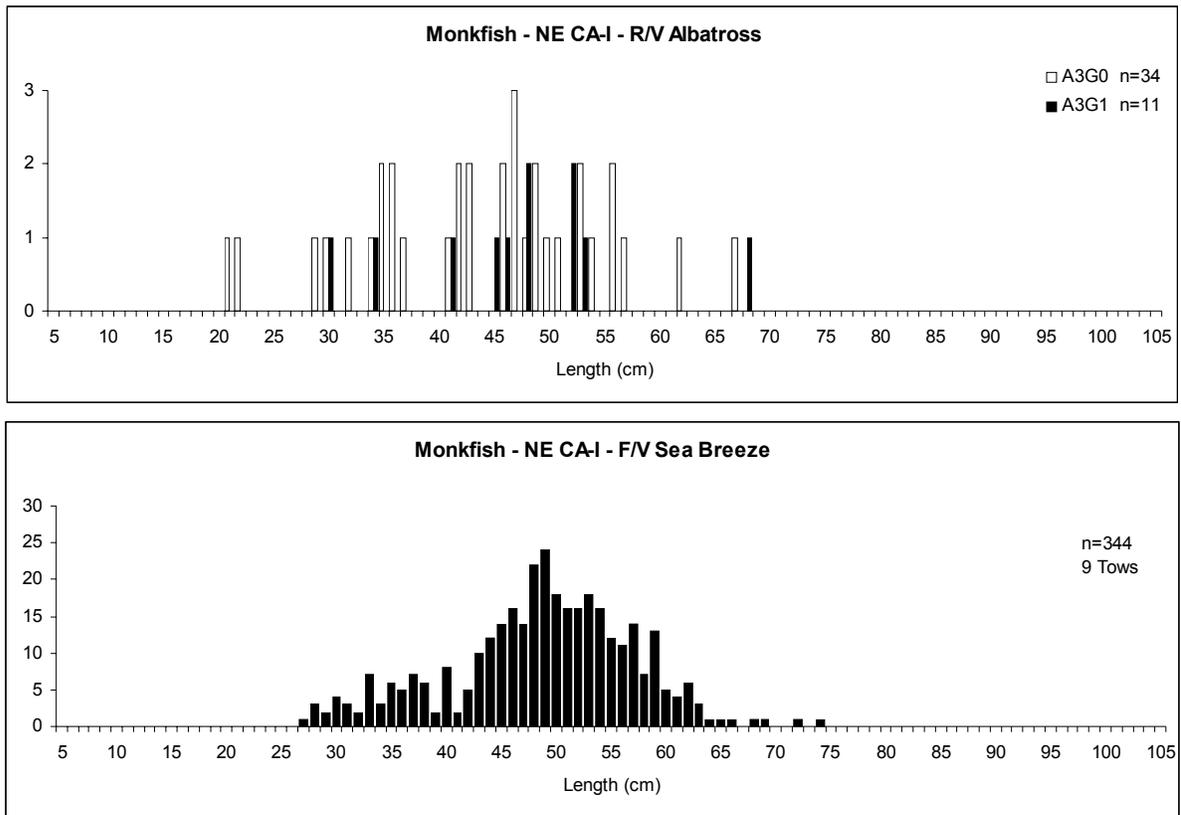


Figure 11. Length composition of Redfish from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A1G0) and worst case scenario net configurations (label A1G1). For the *F/V Sea Breeze*, ‘Tows’ is the number of tows that the species was sampled for length data. N is the number of fish measured; ‘NW CA-I’ is Area 1 (Northwest Closed Area 1).

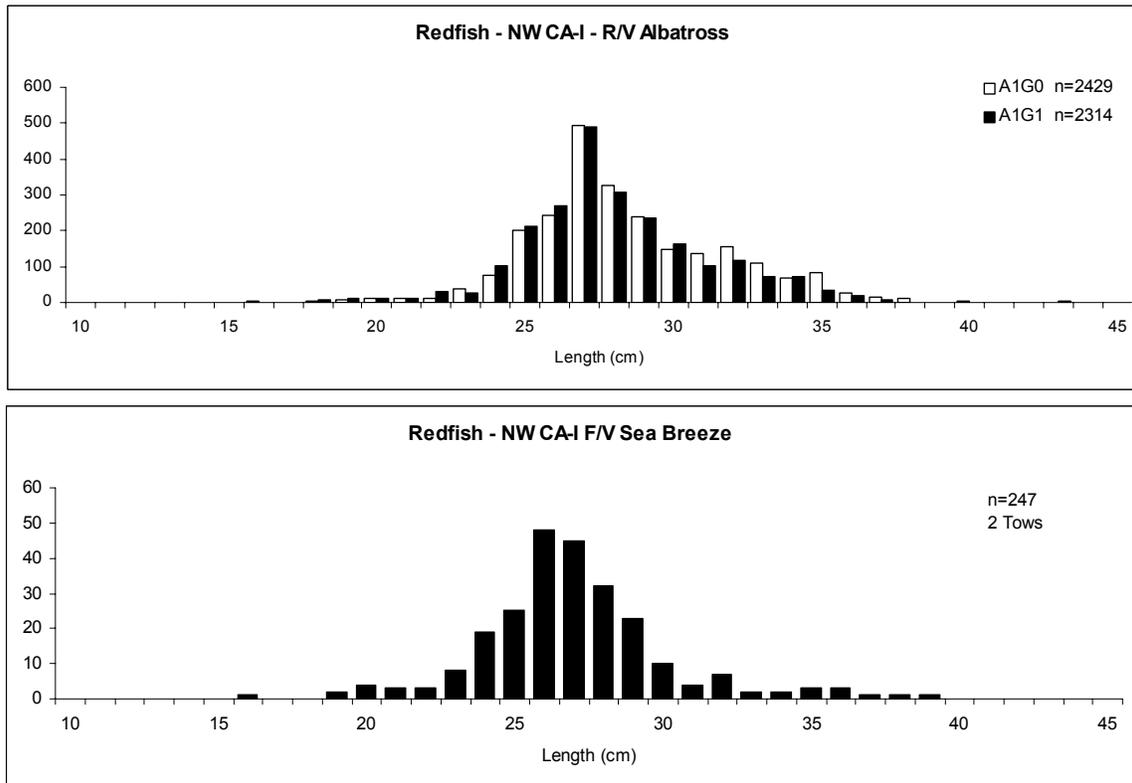


Figure 12. Length composition of Redfish from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A2G0) and worst case scenario net configurations (label A2G1). For the *F/V Sea Breeze*, ‘Tows’ is the number of tows that the species was sampled for length data. N is the number of fish measured; ‘East of Cape Cod’ is Area 2.

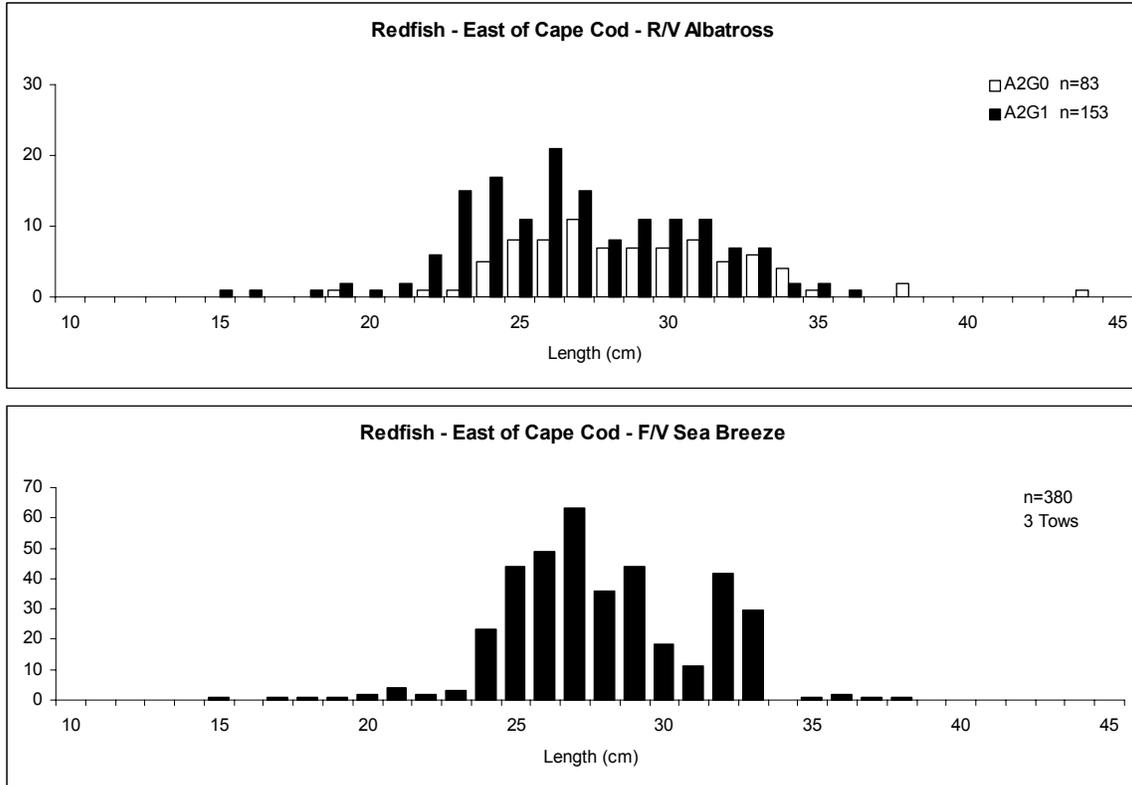


Figure 13. Length composition of American Plaice from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A2G0) and worst case scenario net configurations (label A2G1). For the *F/V Sea Breeze*, ‘Tows’ is the number of tows that the species was sampled for length data. N is the number of fish measured; ‘East of Cape Cod’ is Area 2.

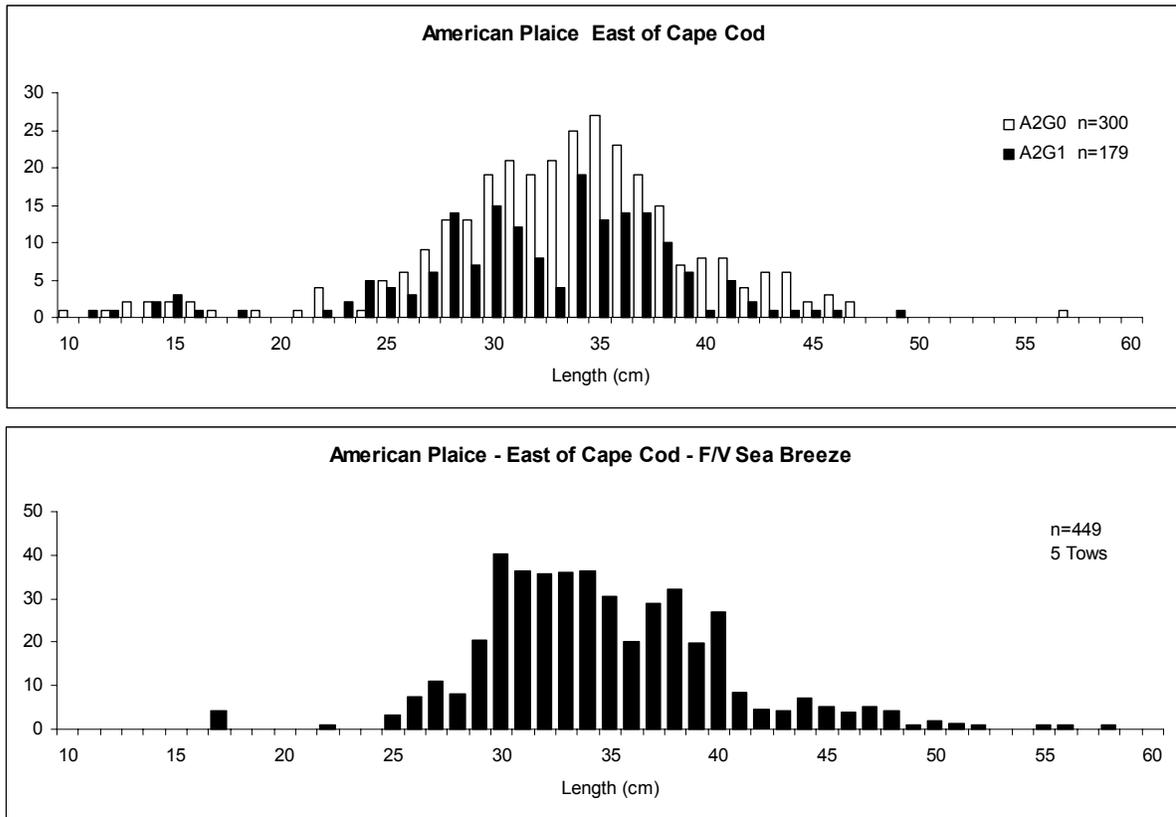


Figure 14. Length composition of Winter Flounder from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A3G0) and worst case scenario net configurations (label A3G1). For the *F/V Sea Breeze*, ‘Tows’ is the number of tows that the species was sampled for length data. N is the number of fish measured; ‘NE CA-I’ is Area 3 (Northeast Closed Area 1).

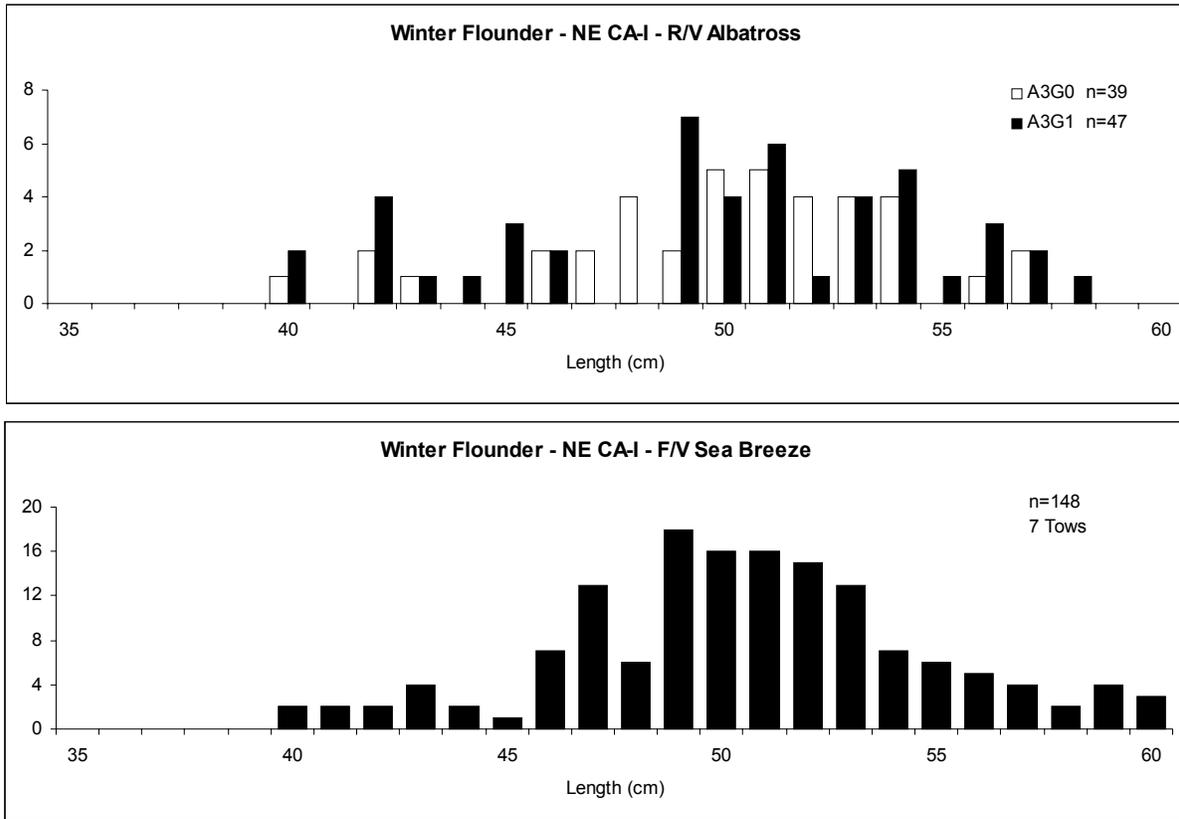


Figure 15. Length composition of Witch Flounder from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A2G0) and worst case scenario net configurations (label A2G1). For the *F/V Sea Breeze*, ‘Tows’ is the number of tows that the species was sampled for length data. N is the number of fish measured; ‘East of Cape Cod’ is Area 2.

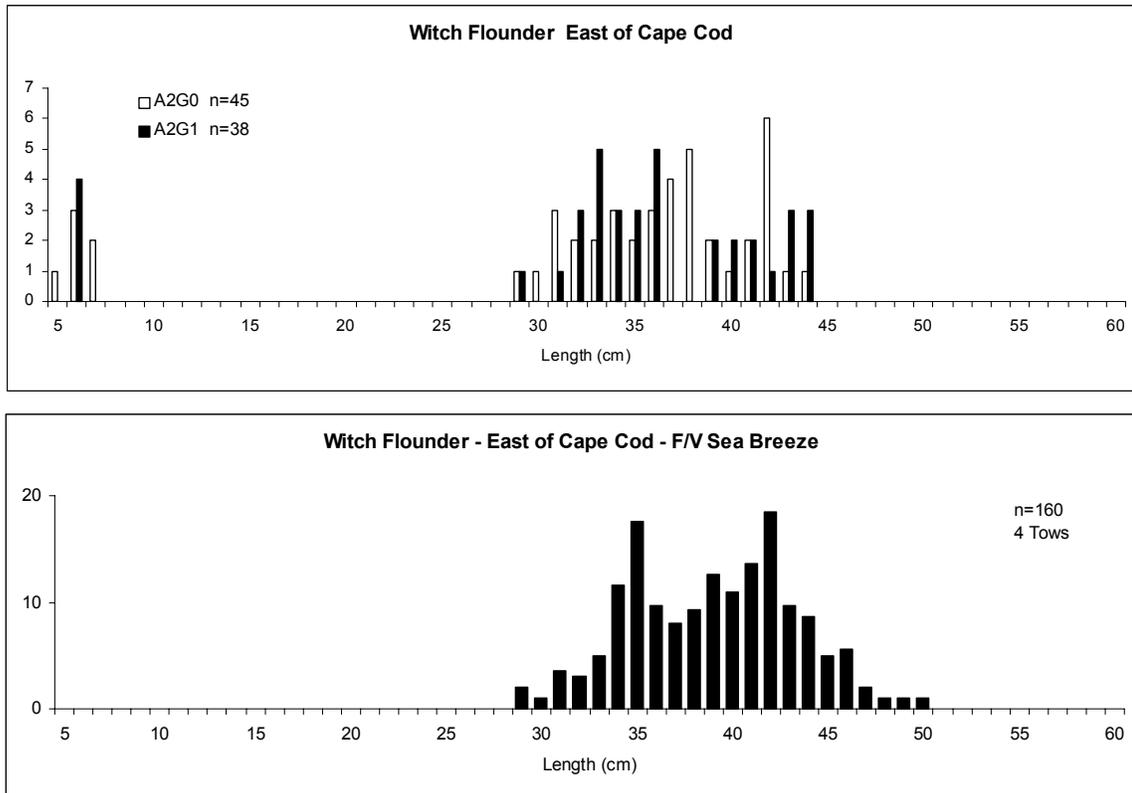


Figure 16. Length composition of Fourspot Flounder from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A3G0) and worst case scenario net configurations (label A3G1). For the *F/V Sea Breeze*, 'Tows' is the number of tows that the species was sampled for length data. N is the number of fish measured; 'NE CA-I' is Area 3 (Northeast Closed Area 1).

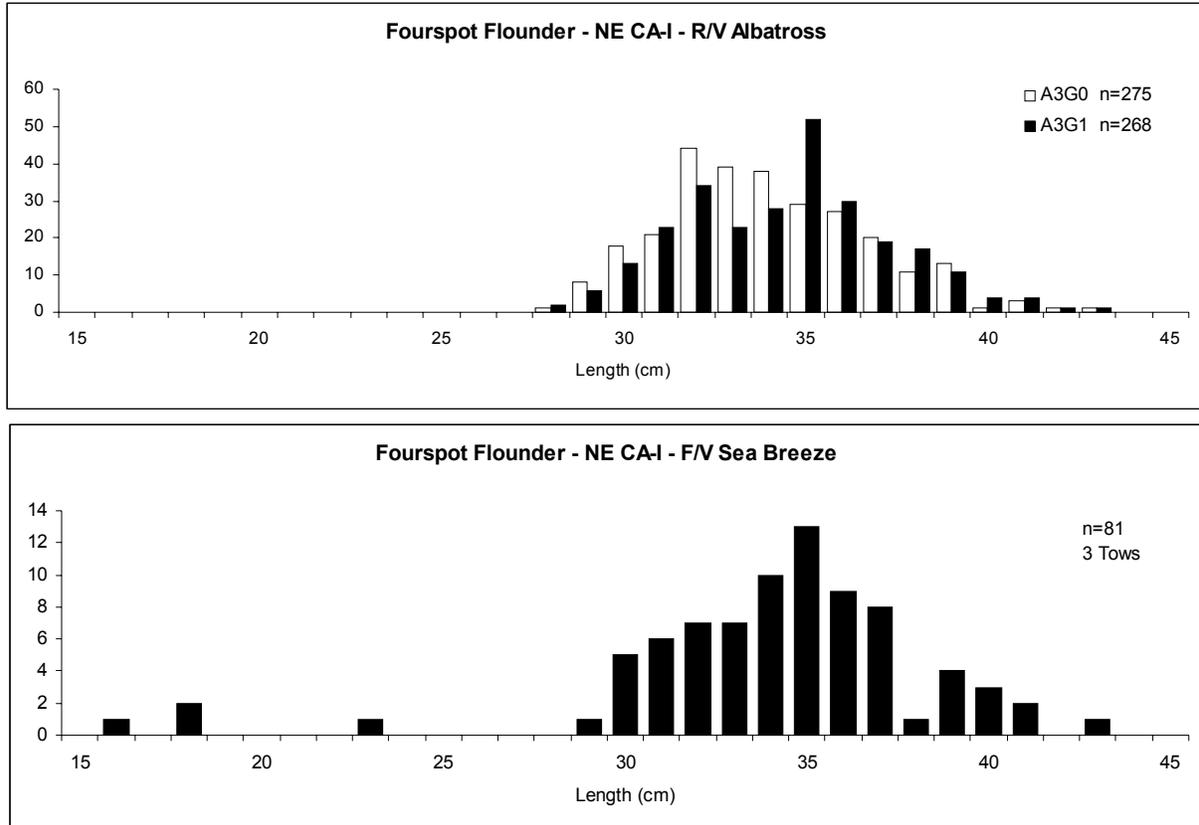


Figure 17. Length composition of Spiny Dogfish from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A2G0) and worst case scenario net configurations (label A2G1). For this species, only stations 24 and 44 from the *R/V Albatross IV* had lengths sampled on the *F/V Sea Breeze*. For the *F/V Sea Breeze*, ‘Tows’ is the number of tows that the species was sampled for length data. N is the number of fish measured; ‘East of Cape Cod’ is Area 2.

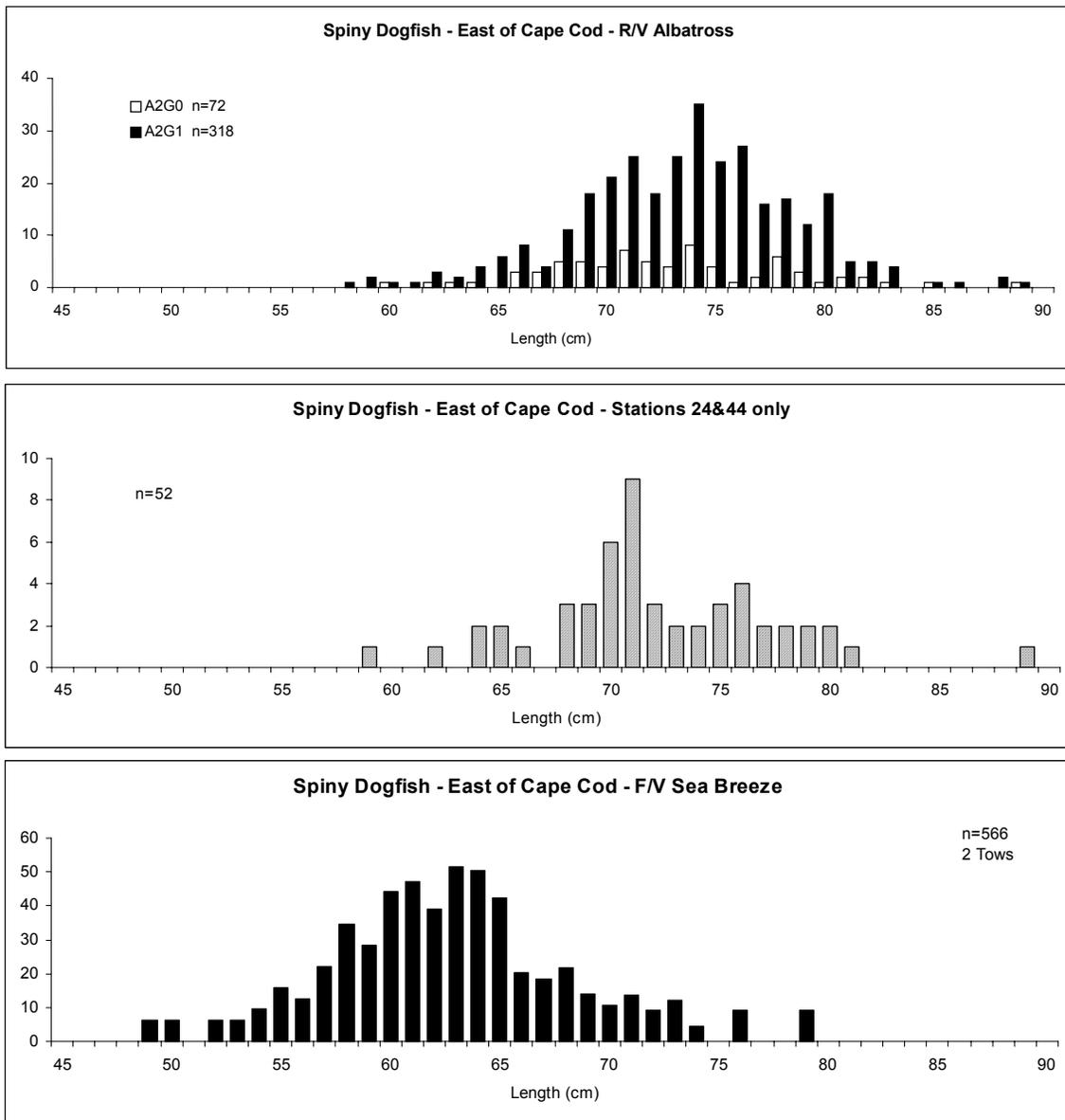


Figure 18. Length composition of Little Skate from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A3G0) and worst case scenario net configurations (label A3G1). For the *F/V Sea Breeze*, ‘Tows’ is the number of tows that the species was sampled for length data. N is the number of fish measured; ‘NE CA-I’ is Area 3 (Northeast Closed Area 1).

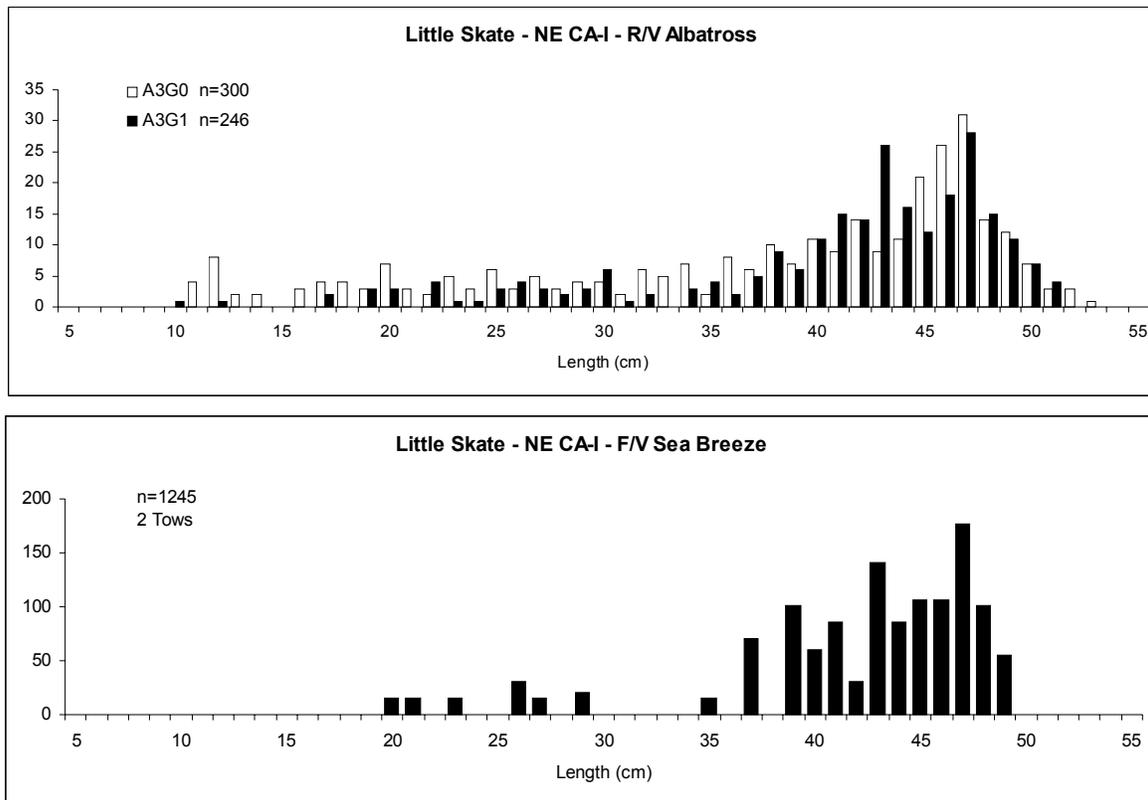


Figure 19. Length composition of Barndoor Skate from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A3G0) and worst case scenario net configurations (label A3G1). For the *F/V Sea Breeze*, ‘Tows’ is the number of tows that the species was sampled for length data. N is the number of fish measured; ‘NE CA-I’ is Area 3 (Northeast Closed Area 1).

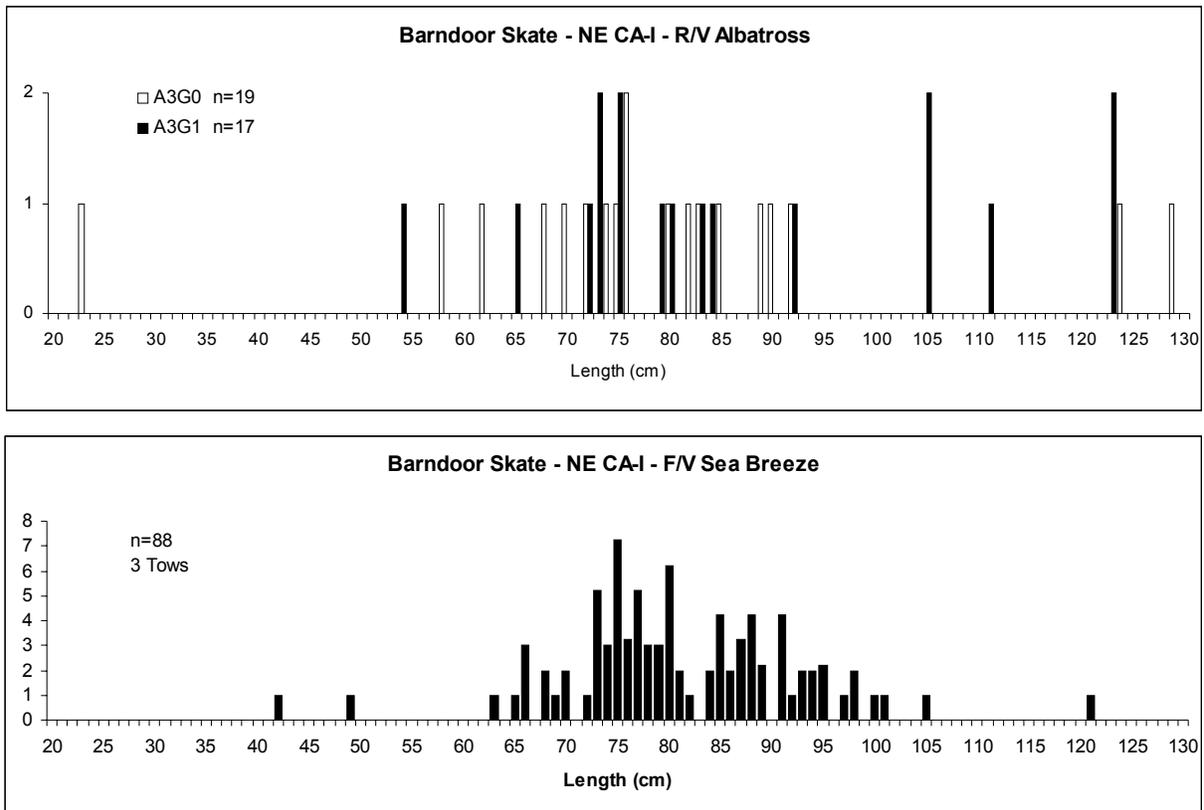


Figure 20. Length composition of Atlantic Herring from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A2G0) and worst case scenario net configurations (label A2G1). For the *F/V Sea Breeze*, 'Tows' is the number of tows that the species was sampled for length data. N is the number of fish measured; 'East of Cape Cod' is Area 2.

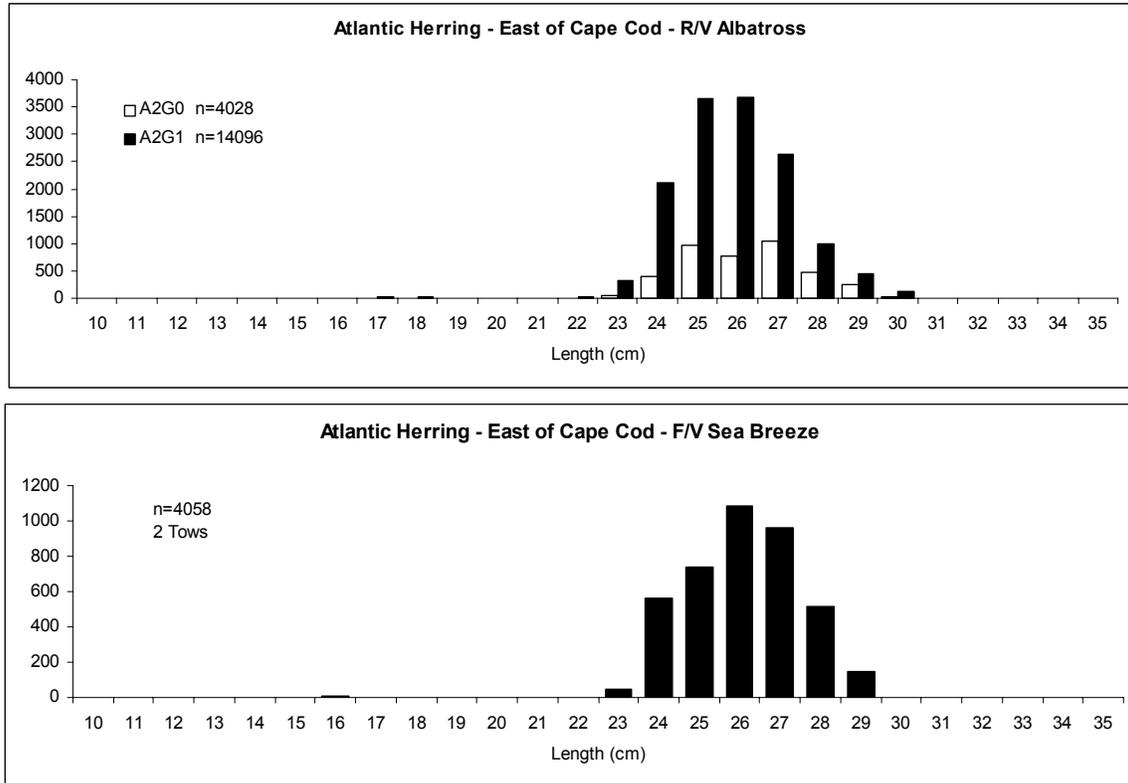


Figure 21. Length composition of Butterfish from the *R/V Albatross IV* and *F/V Sea Breeze*. *R/V Albatross IV* data are for the optimal (label A3G0) and worst case scenario net configurations (label A3G1). For the *F/V Sea Breeze*, 'Tows' is the number of tows that the species was sampled for length data. N is the number of fish measured; 'NE CA-I' is Area 3 (Northeast Closed Area 1).

