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Sampling age structures in NEFSC trawl surveys

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Big Picture

Issue: How to set rules for collecting age structures?

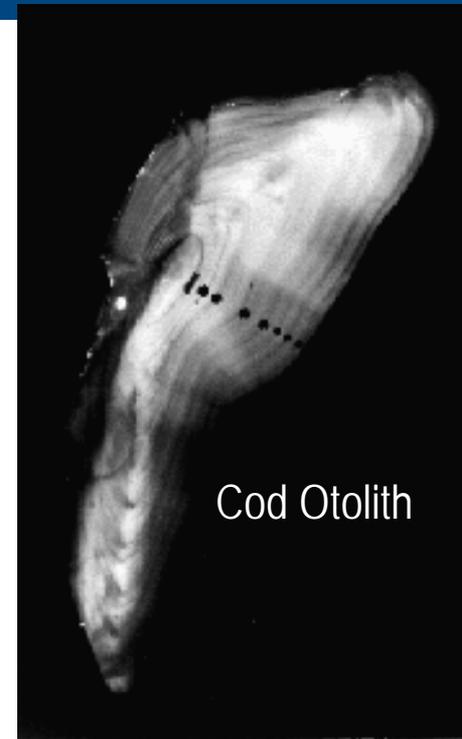
- Do not know in advance how many fish will be caught in any tow, stratum, or season
- Do not know in advance size distribution
- Cannot collect age structures from all fish

Solution: Sample species by length per tow

- For example, 1 fish per 1 cm (1:1), 1:5, 3:3, all $> X$
- Spread samples spatially
- More samples from tows with larger catches

Production ageing

Species	First Year	Last Year	Number of Aged Fish		
			Spring	Fall	Total
ATLANTIC HERRING	1987	2011	23,455	14,560	38,015
SILVER HAKE	1973	2011	50,706	55,930	106,636
ATLANTIC COD	1970	2013	27,285	22,534	49,819
HADDOCK	1963	2013	30,079	36,949	67,028
POLLOCK	1970	2011	7,499	6,148	13,647
WHITE HAKE	1982	2012	10,506	14,509	25,015
RED HAKE	1970	2009	10,764	9,515	20,279
AMERICAN PLAICE	1980	2011	18,285	17,899	36,184
SUMMER FLOUNDER	1976	2012	9,666	12,911	22,577
YELLOWTAIL FLOUNDER	1963	2013	32,574	29,740	62,314
WINTER FLOUNDER	1976	2013	23,661	17,821	41,482
WITCH FLOUNDER	1982	2012	7,249	6,421	13,670
ATLANTIC MACKEREL	1973	2013	12,867	2,833	15,700
BUTTERFISH	1982	2012	9,740	25,475	35,215
BLACK SEA BASS	1983	2011	3,026	3,381	6,407
SCUP	1971	2012	3,474	14,254	17,728
ACADIAN REDFISH	1975	2010	5,308	21,225	26,533
GOOSEFISH	1993	2007	1,361	1,788	3,149
Total			287,505	313,893	601,398



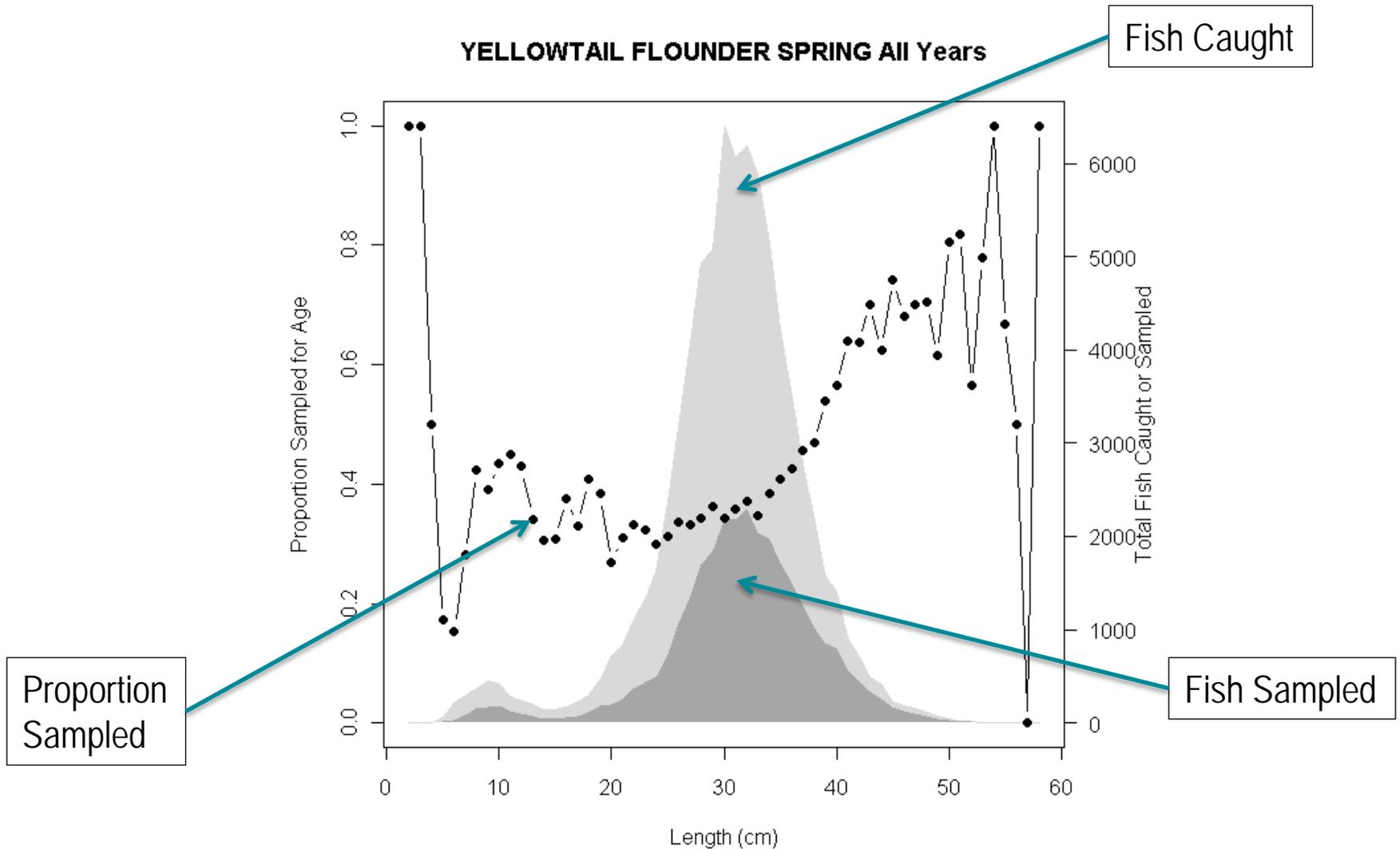
Cod Otolith



Yellowtail scale

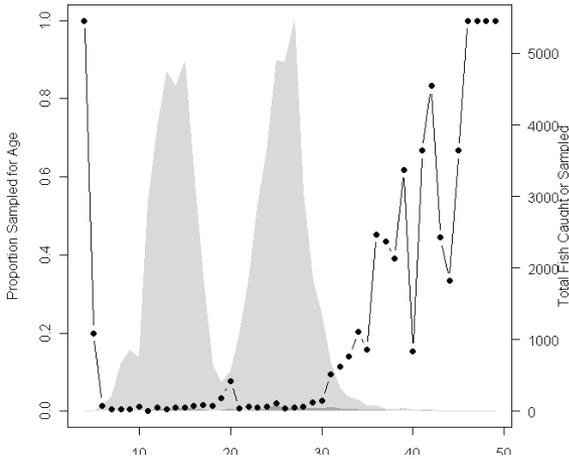
Sampling

YELLOWTAIL FLOUNDER SPRING All Years

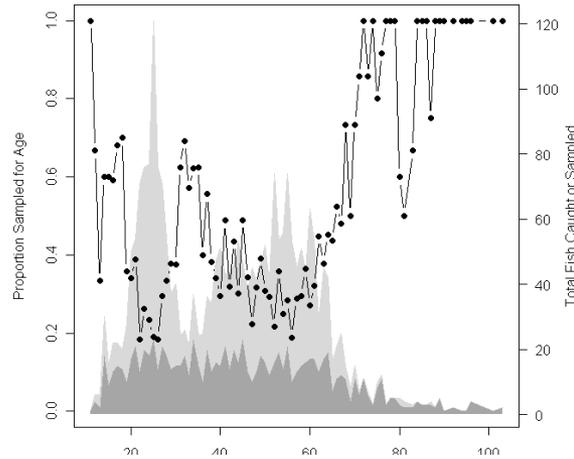


Six species 2009

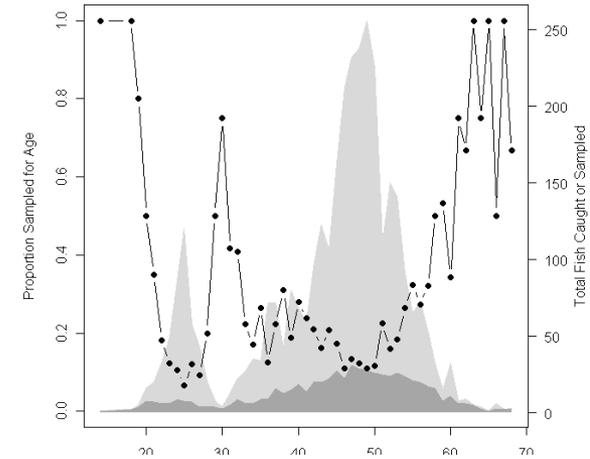
SILVER HAKE SPRING 2009



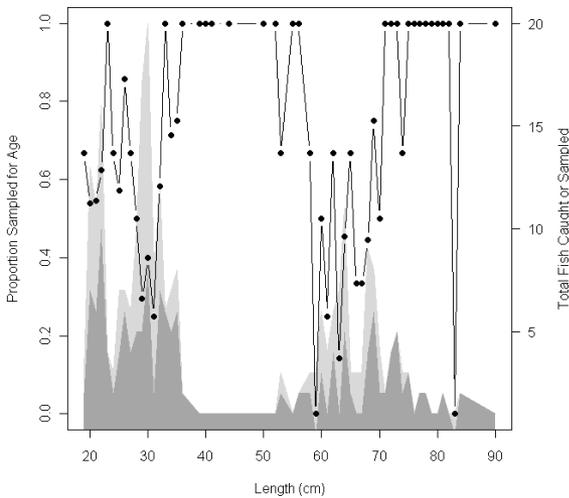
ATLANTIC COD SPRING 2009



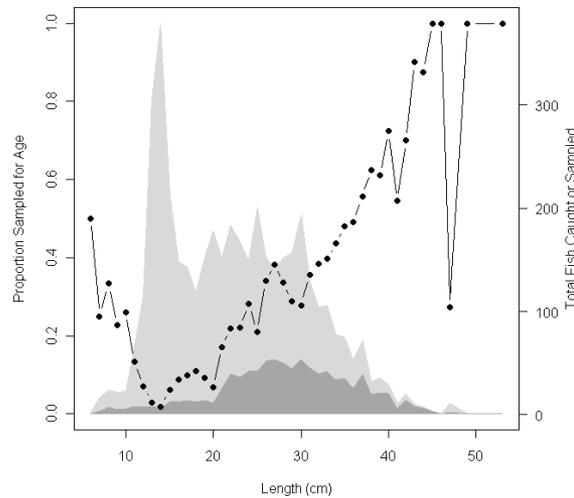
HADDOCK SPRING 2009



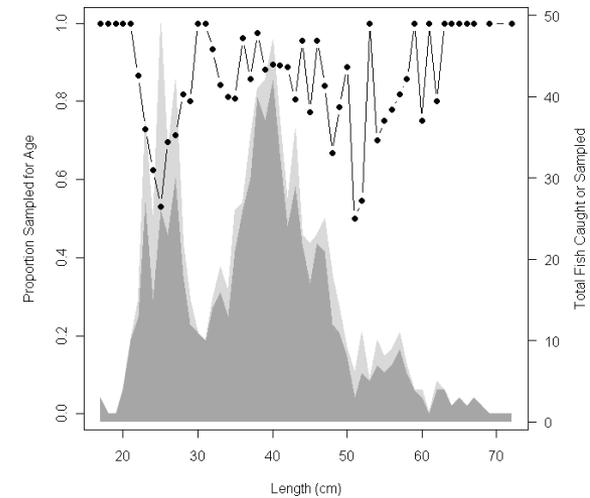
POLLOCK SPRING 2009



AMERICAN PLAICE SPRING 2009

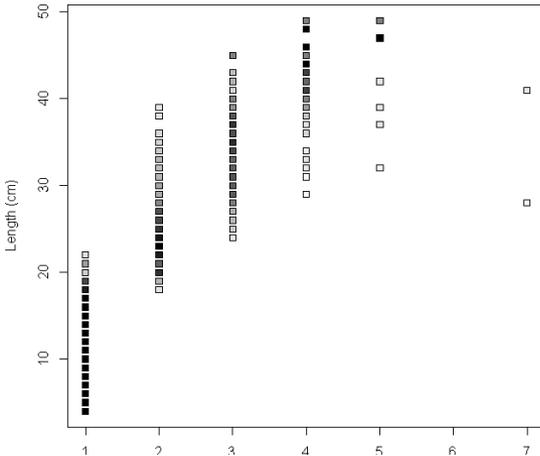


SUMMER FLOUNDER SPRING 2009

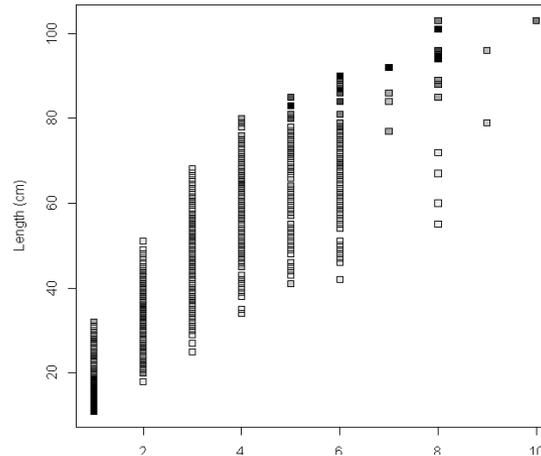


Age-length keys for six species 2009

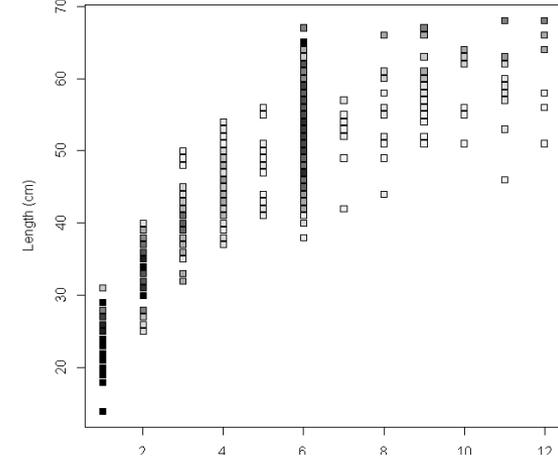
SILVER HAKE SPRING 2009



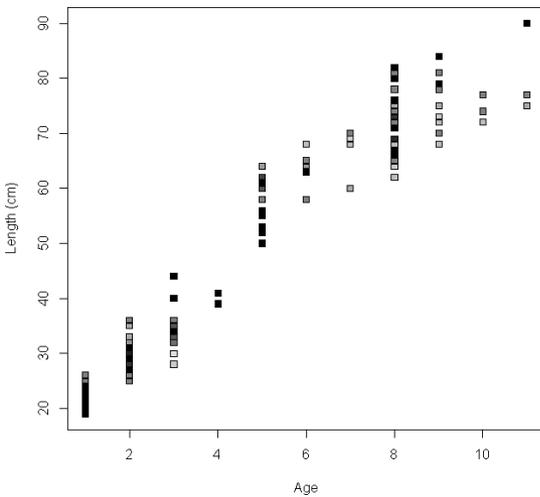
ATLANTIC COD SPRING 2009



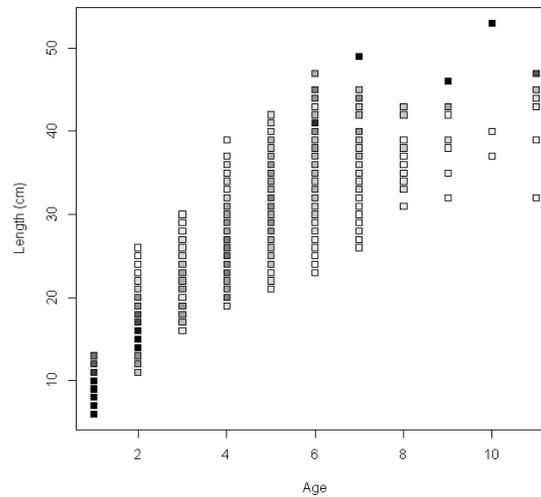
HADDOCK SPRING 2009



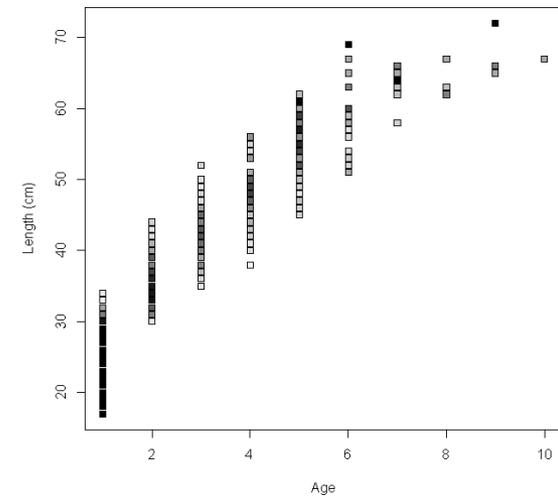
POLLOCK SPRING 2009



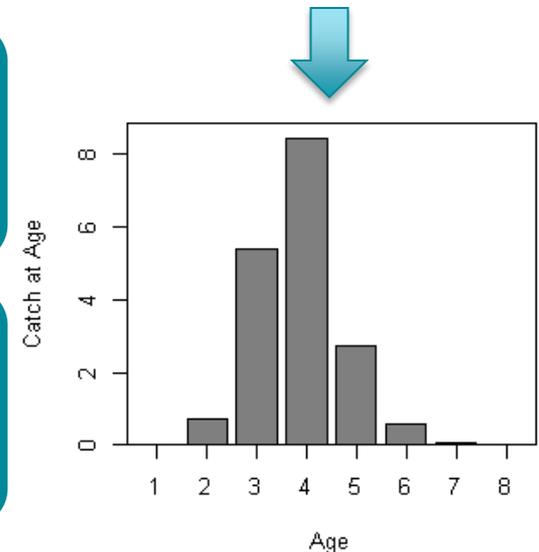
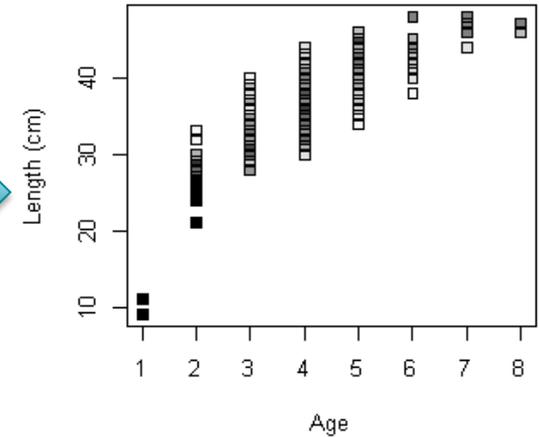
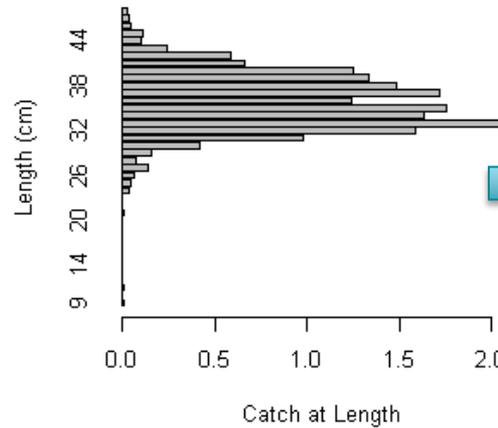
AMERICAN PLAICE SPRING 2009



SUMMER FLOUNDER SPRING 2009



Conclusions



Ageing of survey data is good

Rules in place collect appropriate samples

- Feedback from Pop Dy to FEMAD ensures this