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Greenland halibut and witch flounder on the Flemish Cap (Division 3M)

by

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Landings

Greenland halibut and witch flounder have always been considered as simply incidental catches on the Flemish Cap with too low abundance to be of any commercial value. Reported landings indicate this with landings for witch being negligible except for 1973 when 248 t was reported for Greenland halibut, never more than a few hundred tons (Table 1). A catch of 524 tons of Greenland halibut in 1978 is the second highest reported next to 1972 landings of 604 t. These estimates are probably minimal since there may have been considerable discarding of these species due to their non-commercial values in this area.

Biomass surveys

During early winter of 1978, 1979 and 1980, stratified random biomass surveys were conducted in the Flemish Cap area by the Canadian research vessel "Gadus Atlantica" operated by the Northwest Atlantic Fisheries Center at St. John's, Newfoundland. For each year, the coverage included all strata over all depth zones. Consequently, all surveys should be indicative of the total stock of each species in the Flemish Cap area.

Distribution and biomass of witch flounder

The average numbers and weights per set for the 1978 survey are presented in Table 2, in Table 3 for 1979 survey and Table 4 for the 1980 survey. Witch flounder in all three surveys appear to be generally located along the western-central part of the Flemish Cap in strata 505-511 (Fig. 1).

The biomass estimates in Table 5 indicated very low estimates of 938 tons in 1978 down to 214 tons in 1979 and up slightly to 359 tons in 1980.

The trawlable population numbers at age for the three surveys are shown in Fig 2 for males and Fig 3 for females. While the figures do indicate the age range found on the Flemish Cap, the numbers of ages read were too few to allow any quantitative comparison. Probably the most noticeable of the age composition is that fish were caught as low as age 3 which is rare for this species in adjoining areas.

Distribution and biomass of Greenland halibut

The average numbers and weights per set for the 1978 survey are presented in Table 6, in Table 7 for the 1979 survey and Table 8 for the 1980 survey.

In all three surveys, Greenland halibut are located in the strata at the outer most zone all around the Flemish Cap. This would not be unexpected since this is the deepest stratified area of the Flemish Cap and the most likely area where Greenland halibut would be found.

Biomass estimates in Table 5 show an estimate of 1760 t in 1978, 1152 t in 1979 and a high of 2570 t in 1980. The increase in 1980 is in general agreement with increasing abundance of Greenland halibut in whole of the Northwest Atlantic.

The age composition shown in Fig. 4 and 5 as with witch flounder should probably not be compared quantitatively without some caution, however, there were considerably more age readings than for witch. It should be noted that the large year-classes in 1980 are similar to those present in high abundance in the northern stock. This may be coincidental or the increase in Greenland halibut biomass on the Flemish Cap may in fact be a result of overflow from the northern Grand Bank area.

Table 1. 3M Nominal Catches in Metric Tons for Greenland Halibut and Witch (1967-1978)

YEAR	G. HALIBUT	WITCH
67	16	1
68	-	-
69	-	-
70	-	-
71	9	-
72	604	68
73	102	248
74	437	50
75	114	9
76	6	1
77	42	17
78	524	1

Table 2a. Gadus 5 1978 3M Day + Night

GREYSOLE						
STATION	NO. SETS	NUMBER	SET/AV.	UNITS	TOTAL NO	VAR.
501	4	0.0	0.0	25672.	0.	0.0
502	11	6.00	0.55	62904.	34311.	2.27
503	10	5.00	0.50	47140.	23570.	0.28
504	6	4.00	0.67	26122.	17415.	0.27
505	10	11.00	1.10	52770.	58047.	3.43
506	8	29.00	3.63	37232.	134945.	9.41
507	8	18.00	2.00	61703.	123406.	6.57
508	9	8.00	0.89	48491.	43104.	0.61
509	4	1.00	0.25	23570.	5893.	0.25
510	14	70.00	5.00	71386.	356930.	31.23
511	11	24.00	2.18	60502.	132004.	1.96
512	5	0.00	1.20	50293.	60352.	2.70
513	4	0.0	0.0	18691.	0.	0.0
514	8	3.00	0.38	45189.	16946.	0.65
515	7	12.00	1.71	49993.	85702.	0.24
516	4	3.00	0.75	47591.	35693.	0.92
517	4	0.0	0.0	16214.	0.	0.0
518	2	2.00	1.00	15763.	15763.	2.00
519	5	2.00	0.40	31077.	12431.	0.80
AVERAGE						
MEAN	UPPER	LOWER	MEAN	UPPER	LOWER	
1156528.	1448758.	804298.	1.46	1.83	1.09	

Table 2b. Gadus 5 1978 3M Day + Night

GREYSOLE						
STATION	NO. SETS	WEIGHT	SET/AV.	UNITS	TOTAL WT	VAR.
501	4	0.0	0.0	25672.	0.	0.0
502	11	5.45	0.50	62904.	31155.	1.87
503	10	2.72	0.27	47140.	12841.	0.18
504	6	5.45	0.91	26122.	23719.	0.66
505	10	5.99	1.00	52770.	52707.	1.82
506	8	24.52	3.06	37232.	114097.	7.33
507	8	11.12	1.39	61703.	85790.	3.16
508	9	0.63	0.96	48491.	46476.	1.14
509	4	0.45	0.11	23570.	2675.	0.05
510	14	52.93	4.28	71386.	305572.	23.73
511	11	21.34	1.94	60502.	117362.	1.40
512	5	1.27	0.25	50293.	12786.	0.14
513	4	0.0	0.0	18691.	0.	0.0
514	8	3.40	0.43	45189.	19233.	0.71
515	7	13.34	1.91	49993.	95650.	0.48
516	4	0.36	0.09	47591.	4321.	0.02
517	4	0.0	0.0	16214.	0.	0.0
518	2	0.09	0.05	15763.	716.	0.00
519	5	2.04	0.41	31077.	12698.	0.83
AVERAGE						
MEAN	UPPER	LOWER	MEAN	UPPER	LOWER	
937798.	1175029.	700569.	1.14	1.48	0.88	

Table 3a. Gadus 17 1979 3M

GREYSOLE						
STRATUM	NO. SETS	NUMBER	SET/AV.	UNITS	TOTAL NO	VAR.
501	4	0.0	0.0	25672.	0.	0.0
502	6	1.00	0.17	62904.	10484.	0.17
503	6	1.00	0.17	47140.	7857.	0.17
504	4	0.0	0.0	26122.	0.	0.0
505	6	4.00	0.67	52770.	35180.	0.67
506	6	1.00	0.17	37232.	6205.	0.17
507	6	0.0	0.0	61703.	0.	0.0
508	6	1.00	0.17	48491.	8082.	0.17
509	4	0.0	0.0	23570.	0.	0.0
510	6	9.00	1.50	71386.	107079.	1.10
511	6	2.00	0.33	60502.	20167.	0.27
512	6	0.0	0.0	50293.	0.	0.0
513	4	0.0	0.0	18691.	0.	0.0
514	6	0.0	0.0	45189.	0.	0.0
515	4	2.00	0.50	49993.	24996.	0.33
516	6	0.0	0.0	47591.	0.	0.0
517	3	0.0	0.0	16214.	0.	0.0
518	3	0.0	0.0	15763.	0.	0.0
519	3	3.00	1.00	31077.	31077.	1.00
MEAN		NUMBER	AVERAGE			
		UPPER	LOWER		UPPER	LOWER
251127.		345186.	157068.		0.32	0.44
					0.20	

Table 3b. Gadus 17 1979 3M

GREYSOLE						
STRATUM	NO. SETS	WEIGHT	SET/AV.	UNITS	TOTAL WT	VAR.
501	4	0.0	0.0	25672.	0.	0.0
502	6	0.68	0.11	62904.	7129.	0.08
503	6	1.82	0.30	47140.	14299.	0.55
504	4	0.0	0.0	26122.	0.	0.0
505	6	2.95	0.49	52770.	25945.	0.34
506	6	0.91	0.15	37232.	5647.	0.14
507	6	0.0	0.0	61703.	0.	0.0
508	6	0.68	0.11	48491.	5496.	0.08
509	4	0.0	0.0	23570.	0.	0.0
510	6	10.45	1.74	71386.	124331.	2.03
511	6	1.59	0.26	60502.	16033.	0.17
512	6	0.0	0.0	50293.	0.	0.0
513	4	0.0	0.0	18691.	0.	0.0
514	6	0.0	0.0	45189.	0.	0.0
515	4	0.46	0.12	49993.	5749.	0.02
516	6	0.0	0.0	47591.	0.	0.0
517	3	0.0	0.0	16214.	0.	0.0
518	3	0.0	0.0	15763.	0.	0.0
519	3	0.91	0.30	31077.	9427.	0.12
MEAN		WEIGHT	AVERAGE			
		UPPER	LOWER		UPPER	LOWER
214055.		311132.	116979.		0.27	0.39
					0.15	

Table 4a. Gadus 30 1980 3M

GREYSOLE						
STRATUM	NO. SETS	NUMBER	SET/AV.	UNITS	TOTAL NO	VAR.
501	4	0.0	0.0	25672.	0.	0.0
502	11	4.00	0.36	62904.	22874.	0.45
503	8	4.00	0.50	47140.	23570.	0.57
504	4	0.0	0.0	26122.	0.	0.0
505	8	12.00	1.50	52770.	79155.	1.43
506	6	11.00	1.83	37232.	68258.	2.17
507	10	4.00	0.40	61703.	24681.	0.49
508	8	1.00	0.13	48491.	6061.	0.13
509	4	0.0	0.0	23570.	0.	0.0
510	12	14.00	1.17	71386.	83284.	1.61
511	10	7.00	0.70	60502.	42351.	0.23
512	6	1.00	0.13	50293.	6287.	0.13
513	3	0.0	0.0	18691.	0.	0.0
514	7	1.00	0.14	45189.	6456.	0.14
515	8	4.00	0.50	49993.	24996.	0.86
516	8	1.00	0.13	47591.	5949.	0.13
517	3	1.00	0.33	16214.	5405.	0.33
518	3	0.0	0.0	15763.	0.	0.0
519	5	0.0	0.0	31077.	0.	0.0
MEAN		NUMBER			AVERAGE	
		UPPER		LOWER	UPPER	LOWER
		399327.	503701.	294952.	0.50	0.64
						0.37

Table 4b. Gadus 30 1980 3M

GREYSOLE						
STRATUM	NO. SETS	WEIGHT	SET/AV.	UNITS	TOTAL WT	VAR.
501	4	0.0	0.0	25672.	0.	0.0
502	11	3.75	0.34	62904.	21444.	0.35
503	8	2.00	0.25	47140.	11785.	0.14
504	4	0.0	0.0	26122.	0.	0.0
505	8	14.45	1.81	52770.	95316.	2.14
506	6	8.20	1.37	37232.	50883.	1.98
507	10	4.20	0.42	61703.	25915.	0.75
508	8	1.50	0.19	48491.	9092.	0.28
509	4	0.0	0.0	23570.	0.	0.0
510	12	15.20	1.27	71386.	90422.	2.22
511	10	3.70	0.37	60502.	22386.	0.22
512	6	0.25	0.03	50293.	1572.	0.01
513	3	0.0	0.0	18691.	0.	0.0
514	7	1.00	0.14	45189.	6456.	0.14
515	8	3.50	0.44	49993.	21872.	0.67
516	8	0.25	0.03	47591.	1487.	0.01
517	3	0.10	0.03	16214.	540.	0.00
518	3	0.0	0.0	15763.	0.	0.0
519	5	0.0	0.0	31077.	0.	0.0
MEAN		WEIGHT			AVERAGE	
		UPPER		LOWER	UPPER	LOWER
		359171.	464095.	249247.	0.45	0.59
						0.31

Table 5. Flemish Cap Biomass & Abundance in 000's

Year	Turbot		Witch	
	Biomass	Abundance	Biomass	Abundance
1978	1760	770	938	1157
1979	1152	529	214	251
1980	2570	1206	359	399

Table 6a. Gadus 5 1978 3M Day+Night

TURBOT						
STRATUM	NO. SETS	NUMBER	SET/AV.	UNITS	TOTAL NO	VAR.
501	4	0.0	0.0	25672.	0.	0.0
502	11	0.0	0.0	52900.	0.	0.0
503	10	0.0	0.0	47140.	0.	0.0
504	6	0.0	0.0	26122.	0.	0.0
505	10	1.00	0.10	52770.	5277.	0.10
506	8	0.0	0.0	37232.	0.	0.0
507	8	0.0	0.0	61703.	0.	0.0
508	9	0.0	0.0	48491.	0.	0.0
509	4	3.20	0.80	23570.	18856.	0.96
510	14	1.00	0.07	71386.	5089.	0.07
511	11	0.0	0.0	60502.	0.	0.0
512	5	6.00	1.20	50293.	60392.	2.70
513	4	9.00	2.25	18691.	42055.	4.25
514	8	15.00	1.88	45189.	84729.	1.88
515	7	0.0	0.0	49993.	0.	0.0
516	4	17.00	4.25	47591.	202260.	22.25
517	4	3.00	0.75	16214.	12160.	0.25
518	2	6.00	3.00	15763.	47290.	8.00
519	5	47.00	9.40	31077.	292120.	8.80
		NUMBER		UNITS	AVERAGE	
MEAN		UPPER		LOWER	UPPER	LOWER
770198.		1101473.		438922.	0.97	1.39 0.55

Table 6b. Gadus 5 1978 3M Day+Night

TURBOT						
STRATUM	NO. SETS	WEIGHT	SET/AV.	UNITS	TOTAL WT	VAR.
501	4	0.0	0.0	25672.	0.	0.0
502	11	0.0	0.0	52900.	0.	0.0
503	10	0.0	0.0	47140.	0.	0.0
504	6	0.0	0.0	26122.	0.	0.0
505	10	3.18	0.32	52770.	16770.	1.01
506	8	0.0	0.0	37232.	0.	0.0
507	8	0.0	0.0	61703.	0.	0.0
508	9	0.0	0.0	48491.	0.	0.0
509	4	7.81	1.95	23570.	46014.	5.35
510	14	4.09	0.29	71386.	20635.	1.19
511	11	0.0	0.0	60502.	0.	0.0
512	5	12.03	2.41	50293.	121015.	12.82
513	4	23.61	5.90	18691.	110314.	44.66
514	8	42.58	6.07	45189.	274397.	18.43
515	7	0.0	0.0	49993.	0.	0.0
516	4	39.72	9.93	47591.	472635.	84.45
517	4	5.90	1.48	16214.	23924.	1.29
518	2	16.80	8.40	15763.	132397.	54.52
519	5	47.17	17.43	31077.	541776.	16.24
		WEIGHT		UNITS	AVERAGE	
MEAN		UPPER		LOWER	UPPER	LOWER
1760074.		2400046.		1111101.	2.22	3.04 1.40

Table 7a. Gadus 17 1979 3M

TURBOT						
STRATUM	NO. SETS	NUMBER	SET/AV.	UNITS	TOTAL NO	VAR.
501	4	0.0	0.0	25672.	0.	0.0
502	6	0.0	0.0	62904.	0.	0.0
503	6	0.0	0.0	47140.	0.	0.0
504	4	0.0	0.0	26122.	0.	0.0
505	6	0.0	0.0	52770.	0.	0.0
506	6	0.0	0.0	37232.	0.	0.0
507	6	2.00	0.33	61703.	20568.	0.27
508	6	1.00	0.17	48491.	8082.	0.17
509	4	0.0	0.0	23570.	0.	0.0
510	6	0.0	0.0	71386.	0.	0.0
511	6	0.0	0.0	60502.	0.	0.0
512	6	8.00	1.33	50293.	67057.	1.47
513	4	5.00	1.25	18691.	23364.	1.58
514	6	4.00	0.67	45189.	30126.	1.47
515	4	3.00	0.75	49993.	37495.	0.25
516	6	26.00	4.33	47591.	206226.	14.27
517	3	4.00	1.33	16214.	21618.	1.33
518	3	8.00	2.67	15763.	42036.	6.33
519	3	7.00	2.33	31077.	72512.	0.33
MEAN						
		NUMBER	AVERAGE			
		UPPER	LOWER	MEAN	UPPER	LOWER
529084.		705487.	352680.	0.67	0.89	0.45

Table 7b. Gadus 17 1979 3M

TURBOT						
STRATUM	NO. SETS	WEIGHT	SET/AV.	UNITS	TOTAL WT	VAR.
501	4	0.0	0.0	25672.	0.	0.0
502	6	0.0	0.0	62904.	0.	0.0
503	6	0.0	0.0	47140.	0.	0.0
504	4	0.0	0.0	26122.	0.	0.0
505	6	0.0	0.0	52770.	0.	0.0
506	6	0.0	0.0	37232.	0.	0.0
507	6	3.63	0.61	61703.	37330.	1.21
508	6	3.18	0.53	48491.	25700.	1.69
509	4	0.0	0.0	23570.	0.	0.0
510	6	0.0	0.0	71386.	0.	0.0
511	6	0.0	0.0	60502.	0.	0.0
512	6	19.07	3.18	50293.	159848.	9.58
513	4	9.98	2.49	18691.	46634.	3.50
514	6	17.71	2.95	45189.	133382.	23.40
515	4	6.59	1.65	49993.	82363.	2.25
516	6	49.04	8.17	47591.	388974.	31.00
517	3	10.22	3.41	16214.	55235.	10.27
518	3	17.26	5.75	15763.	90693.	24.83
519	3	12.71	4.24	31077.	131661.	1.93
MEAN						
		WEIGHT	AVERAGE			
		UPPER	LOWER	MEAN	UPPER	LOWER
1151820.		1500580.	803060.	1.45	1.89	1.01

Table 8a. Gadus 30 1980 3M

TURBOT						
STRATUM	NO. SETS	NUMBER	SET/AV.	UNITS	TOTAL NO	VAR.
501	4	0.0	0.0	25672.	0.	0.0
502	11	0.0	0.0	62904.	0.	0.0
503	8	0.0	0.0	47140.	0.	0.0
504	4	0.0	0.0	26122.	0.	0.0
505	8	0.0	0.0	52770.	0.	0.0
506	6	0.0	0.0	37232.	0.	0.0
507	10	5.00	0.50	61703.	30891.	0.72
508	8	0.0	0.0	48491.	0.	0.0
509	4	1.00	0.25	23570.	5893.	0.25
510	12	0.0	0.0	71386.	0.	0.0
511	10	0.0	0.0	60502.	0.	0.0
512	8	13.00	1.63	50293.	81726.	3.98
513	3	8.00	2.67	18691.	49843.	0.33
514	7	26.00	3.71	45189.	167844.	5.57
515	8	16.00	2.00	49993.	99986.	5.14
516	8	43.00	5.38	47591.	255800.	31.98
517	3	8.00	2.67	16214.	43237.	2.33
518	3	54.08	18.03	15763.	284147.	282.89
519	5	30.00	6.00	31077.	186459.	21.50
MEAN		NUMBER UPPER		LOWER	MEAN AVERAGE UPPER	LOWER
1205784.		1707980.		703588.	1.52	2.16
						0.89

Table 8b. Gadus 30 1980 3M

TURBOT						
STRATUM	NO. SETS	WEIGHT	SET/AV.	UNITS	TOTAL WT	VAR.
501	4	0.0	0.0	25672.	0.	0.0
502	11	0.0	0.0	62904.	0.	0.0
503	8	0.0	0.0	47140.	0.	0.0
504	4	0.0	0.0	26122.	0.	0.0
505	8	0.0	0.0	52770.	0.	0.0
506	6	0.0	0.0	37232.	0.	0.0
507	10	8.30	0.83	61703.	51213.	2.04
508	8	0.0	0.0	48491.	0.	0.0
509	4	1.25	0.31	23570.	7366.	0.39
510	12	0.0	0.0	71386.	0.	0.0
511	10	0.0	0.0	60502.	0.	0.0
512	8	25.40	3.17	50293.	159680.	16.26
513	3	16.25	5.42	18691.	101243.	2.15
514	7	53.50	7.64	45189.	345370.	46.45
515	8	33.25	4.16	49993.	207782.	14.20
516	8	71.50	8.94	47591.	425342.	35.60
517	3	15.25	5.08	16214.	82420.	12.02
518	3	156.62	52.21	15763.	822934.	3648.86
519	5	59.00	11.80	31077.	366704.	98.20
MEAN		WEIGHT UPPER		LOWER	MEAN AVERAGE UPPER	LOWER
2570053.		4665704.		474402.	3.24	5.89
						0.60

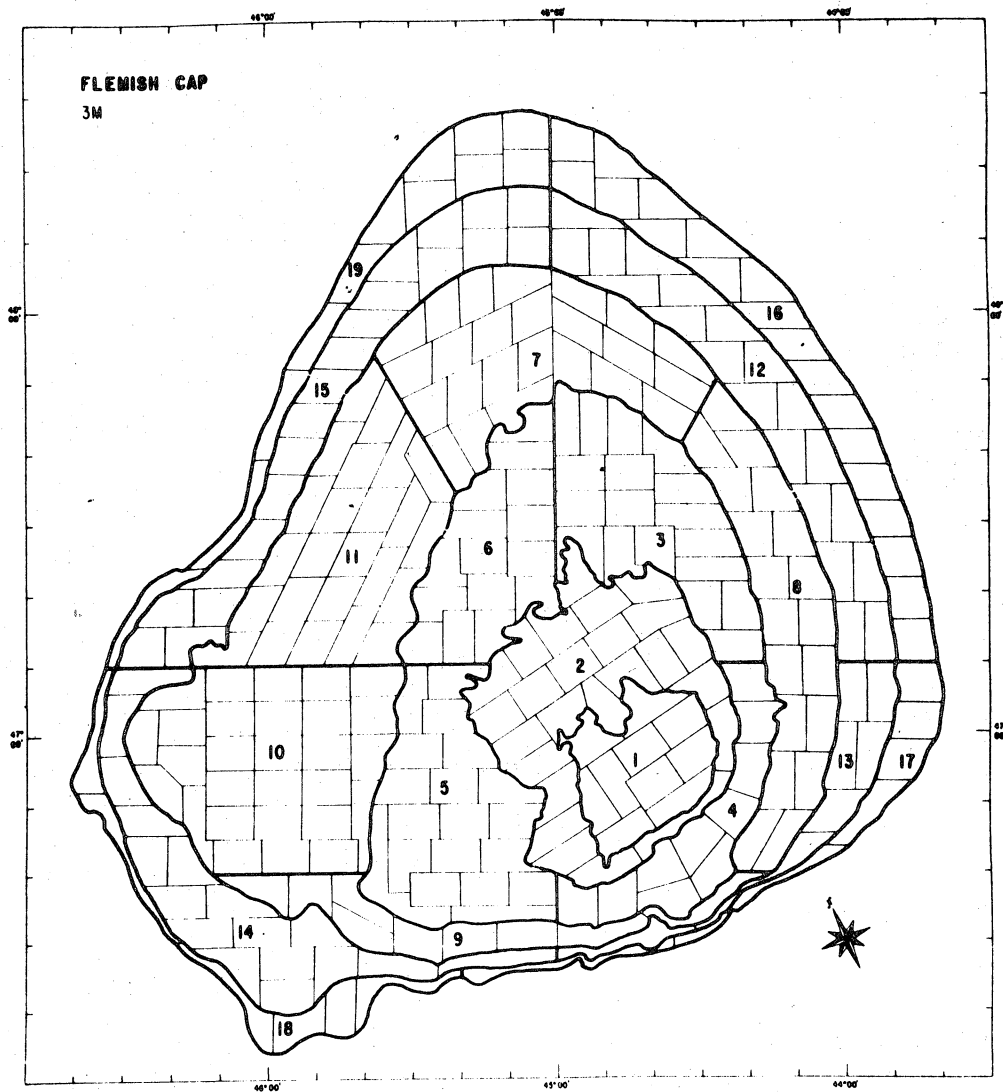


Fig. 1. Strata map of Flemish Cap (ICNAF Div. 3M).

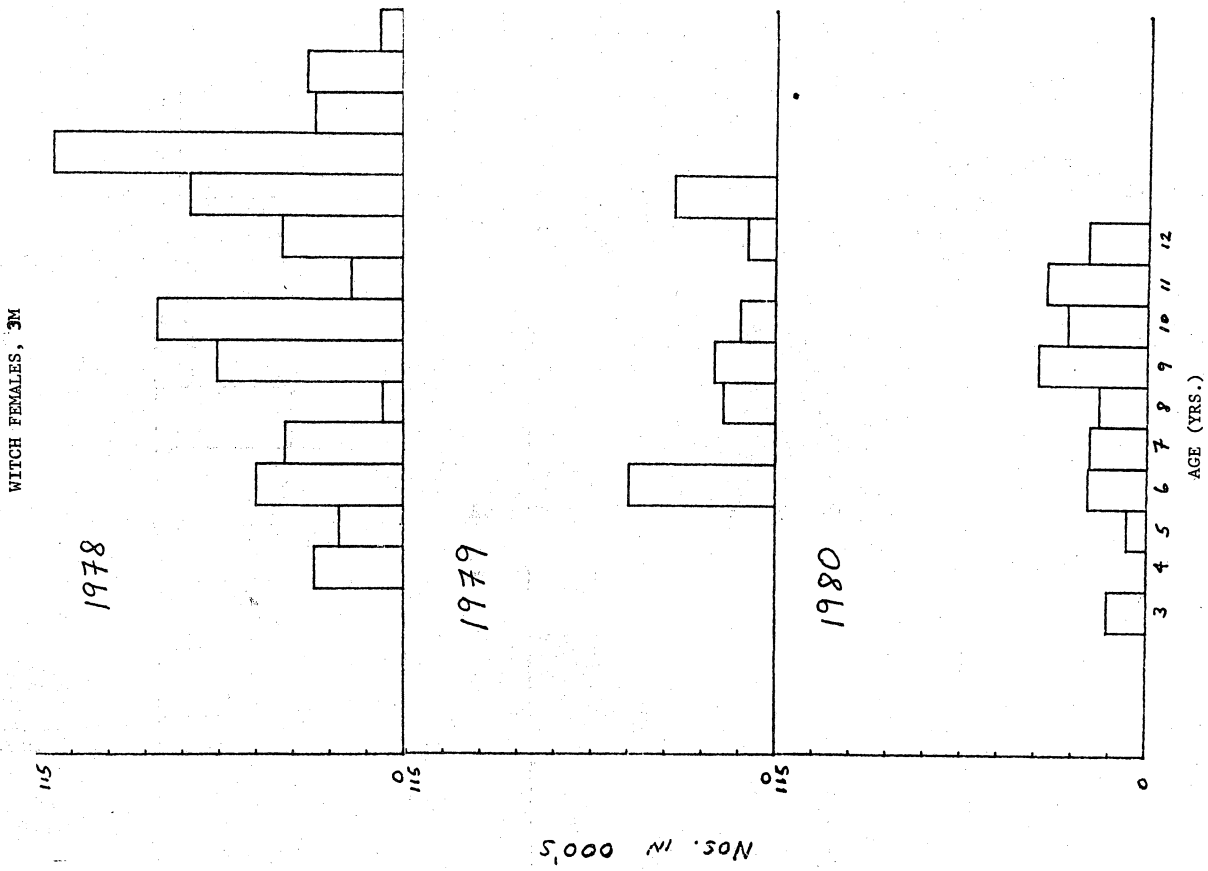


Fig. 3. Estimated Population Nos. at Age (1978-80).

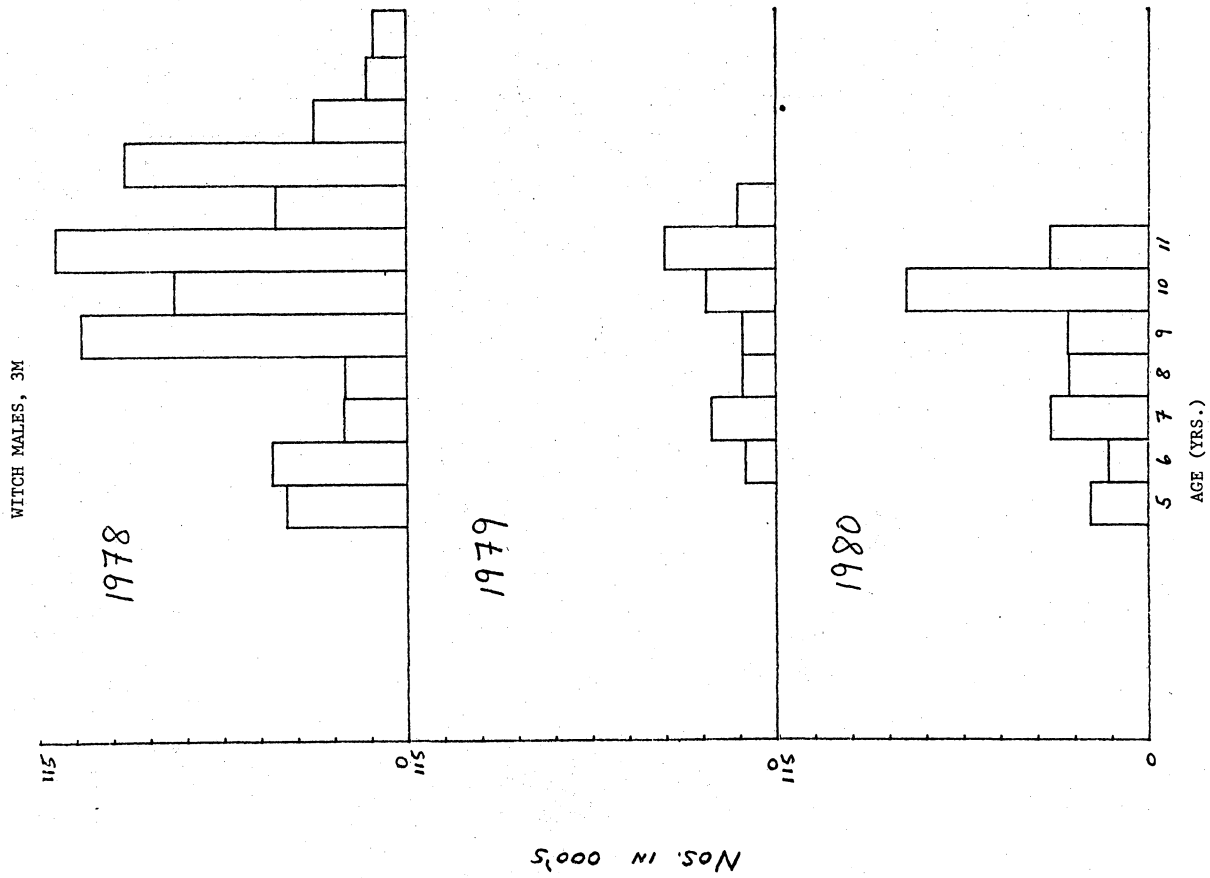


Fig. 2. Estimated Population Nos. at Age (1978-80).

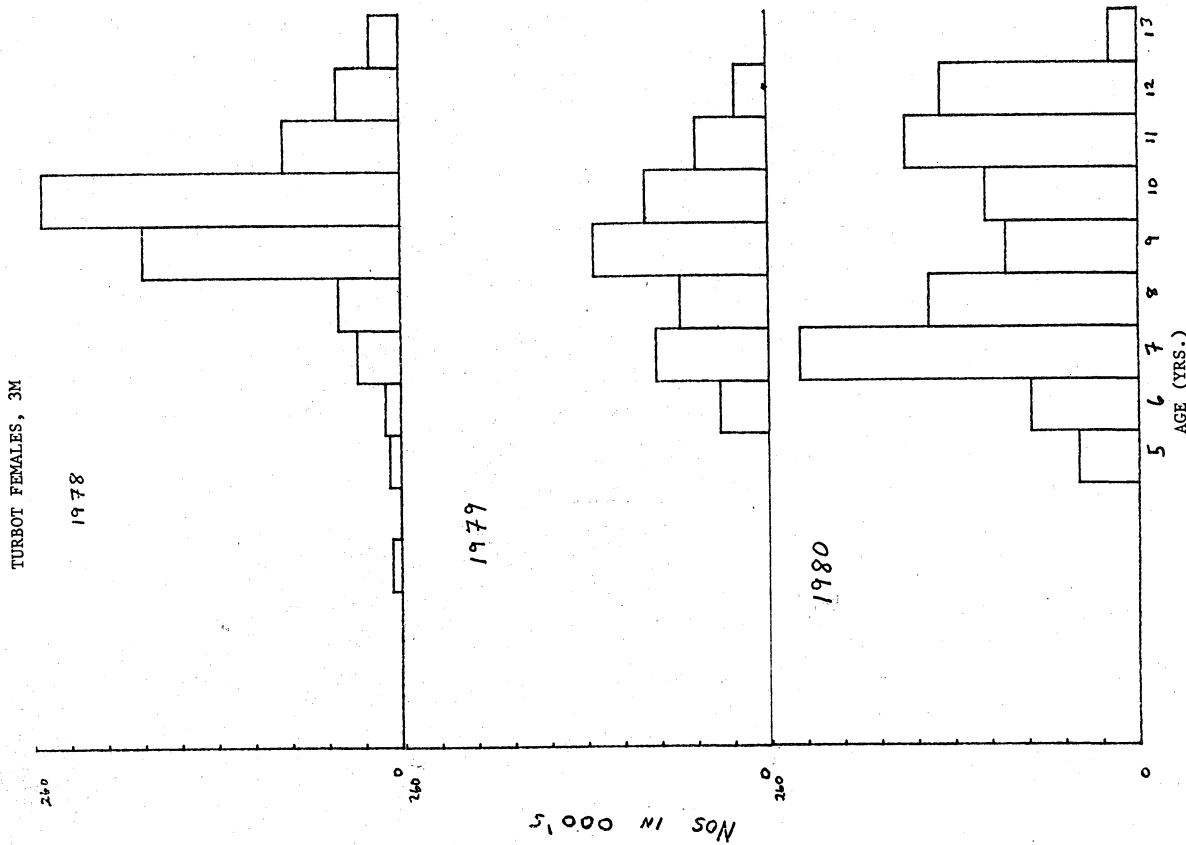


Fig. 4. Estimated Population Nos. at Age (1978-80).

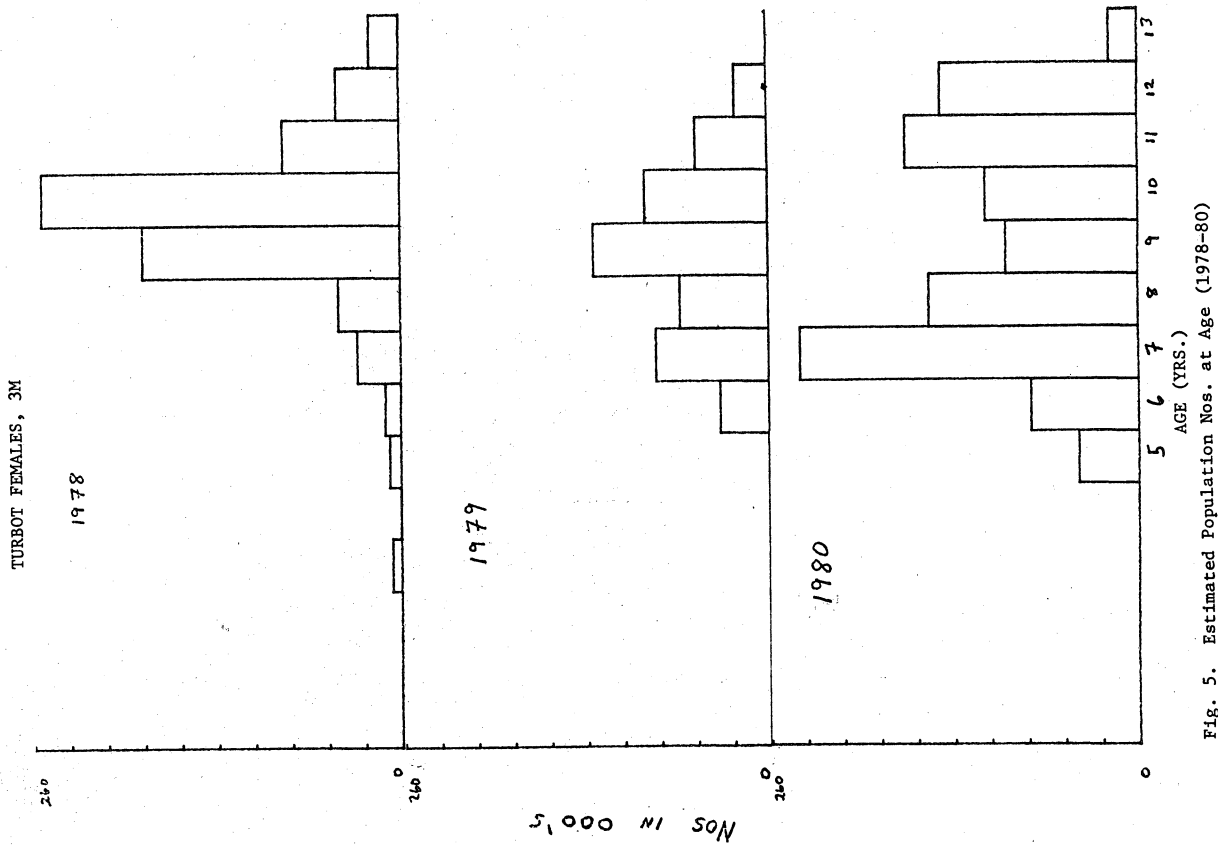


Fig. 5. Estimated Population Nos. at Age (1978-80)