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Review of the White Hake, Urophycis tenuis fishery in NAFO Division 4T

by
K. Metuzals[1] and A. Fullerton[2]

[1]Marine Fish Division
Bedford Institute of Oceanography
P. O. Box 1006, Dartmouth, N. S.

[2]Oceanography Department
Dalhousie University
Halifax, N. S.

Abstract

Historical catches were analyzed from 1960-1980. Catches in recent years have increased substantially and in 1980 especially, have exceeded any recorded levels.

Research vessel data are presented from 1970-1980. No ageing material is available at this time. Estimates of total population in numbers and biomass, as well as mean number per tow and mean weight per tow do not indicate a large increase in hake abundance. Increase in catch therefore must be attributed to increased inshore effort.

Résumé

Les prises de 1960 à 1980 ont été examinées. Elles ont augmenté de façon substantielle ces dernières années et surtout en 1980 lorsqu'elles ont dépassé tous les niveaux jamais enregistrés.

Nous présentons les données obtenues par navires de recherche entre 1970 et 1980. Nous ne disposons pas pour le moment de données sur les âges. Les estimations de population totale, en nombre et en biomasse, ainsi que le nombre moyen et le poids moyens de sujets par trait de chalut n'indiquent pas d'augmentation d'abondance de la merluche blanche. L'augmentation des prises est donc attribuable à un effort de pêche côtière accru.

Introduction

In the last ten to fifteen years, hake has become an increasingly important fishery (Whitaker 1980). The growing difficulty in obtaining the traditional white fleshed species, cod, haddock and various flatfish, at prices the consumer is willing to pay, has resulted in an active interest in the Atlantic hake stocks for human consumption.

Locally, this trend can be seen in the hake catch statistics in the Gulf of St. Lawrence. Here, a seasonally directed white hake fishery exists mainly at the east end of Prince Edward Island.

The purpose of this paper is to present an update of the status of the inshore fishery in division 4T for 1980. In addition it reviews the results of the annual groundfish surveys up to 1980 and the available catch rate.

The fishery

Background information on the hake fishery is well documented in Beacham and Schweigert (1980) and Beacham and Nepszy (1980).

The fishery is both directed and seasonal. The peak fishing season is approximately July to September with no fishing from December to April due to ice (Beacham and Nepszy 1980).

Total landings from 1960-1977 have averaged 5000 mt annually (Figure 1); nominal catches since 1978 have increased greatly. The nominal catch for 1979 increased by 60% to 7240 mt and a further increase was seen in 1980, to a high of 11,619 mt (provisional) (Table 1).

Table 2 shows the nominal catch of white hake taken by the major gears. Up to 40% of the total catch is taken by otter trawlers. Danish and Scottish seiners take less, only about 11% of the total catch. Gillnetters take 20-30% of the total catch annually. In 1980, this percentage increased to 38% (Figure 2).

Most of the white hake is taken by vessels under 25 GRT. In Table 3, updated from Beacham and Schweigert (1980), it can be seen that an average of 86% of total hake landings are taken by these small boats. In 1979 and 1980 landings increased to 90% and 93% respectively. Otter trawlers and Danish seiners, as well as gillnetters, increased their catches.

Catches have increased steadily with the increase in price during the past ten years. In earlier years, when hake was considered trash fish, the fishing effort on hake was minimal. However, since hake is now salted or canned as "chicken haddies" and sold for human consumption (A. King, pers. comm.) effort has increased.

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[1] Mr. Armand King, Fisheries Officer, Dept. Fisheries and Oceans, Richibucto, P.E.I.

A representative catch per unit of effort is not available since most catches are made by the inshore fleet and no effort is recorded. Although a 200% increase in fishing effort has been estimated, (A. King pers. comm.) in the Richibucto area, most fishermen claim that an overall decrease in catch per boat of hake has occurred.

Table 4 shows catch by month. Peak months are July, August and September, the time at which hake is resident in the shallow inshore waters.

Research Abundance Indices

Annual groundfish surveys have been carried out in the Gulf of St. Lawrence since 1970, in the month of September by the E.E. Prince.

Data are available per standardized tow, to estimate population and biomass. No ageing material has been analyzed to date. Despite this shortcoming, there are some interesting trends to be seen.

Figure 3 shows the estimated population of white hake in numbers ($\times 10^{-6}$) and estimated biomass in mt ($\times 10^{-3}$). The total population seems to be slightly increasing from 1978 to the present. From 1972 to 1974 there was also an increase, but this was followed by a decline in population numbers (and biomass) until 1977.

An examination of catches per individual strata in the Gulf shows a high percentage of hake (in numbers) in strata 15, 20-21, 25, 32-33, and 37 (Table 5). These strata have accounted for 65-98% of research vessel catches of white hake since 1971.

Table 6 shows the mean number and mean weight of hake per tow for each of the main strata. The overall trend since 1970 shows an increase, peaking in 1974 and 1978.

Figure 4 shows the trend in research vessel stratified mean number per tow and weight (kg) per tow. Smoothed numbers per tow using MED3R (S. Smith pers comm.) also show the increasing trend.

Conclusion

The following changes have been observed in the white hake fishery. Landings have doubled in 1980, and an increase in inshore effort is evident.

Research abundance indices indicate a small increase in abundance from 1970-1980.

It is not possible to predict whether the white hake fishery can support the present level of exploitation on an ongoing basis. There are some grounds for concern that it cannot.

Acknowledgements

Carla Dale and Judy Walker were very helpful in the preparation of tables and figures. Steve Smith provided the computer plots. We are very grateful to all.

References

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Beacham, T. D. and J. Schweigert. 1980. An analysis of white hake (Urophycis tenuis) groundfish, ichthyoplankton, and commercial sampling data in the Southern Gulf of St. Lawrence. CAFSAC Res. Doc. 80/19.

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Table 1. Nominal catch (metric tons round) of white hake in NAFO Div. 4T, 1960-1980.

YEAR	CANADA (MQ)	CANADA (N)	TOTAL
1960	2008	7	2015
61	5333	-	5333
62	7244	-	7244
63	6546	4	6550
64	6205	-	6205
1965	4706	-	4706
66	7024	-	7024
67	6550	-	6550
68	4260	-	4260
69	4207	1	4208
1970	5668	-	5668
71	5646	61	5707
72	5731	26	5757
73	5681	21	5702
74	3603	13	3616
1975	4108	17	4125
76	3745	13	3758
77	3979	5	3984
78	4553	8	4561
79	7233	7	7240
1980*	11619	-	11619

* Provisional.

Table 2. Nominal catch (metric tons round) of Div.4T white hake by gear, 1972-1980 (% of annual landings in parenthesis).[1]

YEAR	OTTER AND PAIR TRAWLS	DANISH AND SCOTTISH SEINES	LONG- and HAND-LINES	GILLNETS	MISCELLANEOUS or UNKNOWN
1972	1140 (20)	863 (15)	1604 (27)	1190 (21)	960 (17)
1973	2468 (43)	211 (4)	1045 (18)	1265 (22)	713 (13)
1974	1454 (40)	305 (8)	345 (10)	1100 (31)	412 (11)
1975	1576 (39)	306 (7)	324 (8)	1285 (31)	634 (15)
1976	1429 (37)	398 (11)	183 (5)	1147 (31)	601 (16)
1977	1227 (31)	408 (10)	231 (6)	1300 (33)	818 (20)
1978	1265 (28)	606 (13)	419 (9)	1689 (37)	582 (13)
1979	2819 (39)	890 (13)	469 (6)	2337 (32)	725 (10)
1980[2]	3561 (31)	1429 (12)	831 (7)	4457 (38)	1343 (12)
TOTAL	16,933 (34)	5,414 (11)	5,450 (11)	15,765 (31)	6,787 (13)

[1] Data for 1972-78 from Beacham and Schweigert (1980)

[2] Provisional

Table 3. Nominal catch (metric tons round) of Div. 4T white hake by vessels under 25 GRT, 1972-1980 (% of total landings for that gear in parenthesis)

YEAR	OTTER & PAIR TRAWLS	DANISH & SCOTTISH SEINES	LONG-and HAND-LINES	GILLNETS	MISC. or UNKNOWN	TOTAL (<25 TONS)	% OF TOTAL LANDINGS
1972	503 (44)	739 (86)	1592 (99)	1185 (100)	960 (100)	4979	86
1973	1801 (73)	7 (3)	1039 (99)	1252 (99)	713 (100)	4812	84
1974	1045 (72)	129 (42)	342 (99)	1084 (99)	412 (100)	3012	83
1975	995 (63)	114 (37)	316 (98)	1191 (93)	634 (100)	3250	79
1976	1067 (75)	269 (68)	183 (100)	1103 (96)	601 (100)	3223	86
1977	1056 (86)	69 (17)	230 (100)	1182 (91)	818 (100)	3355	84
1978	1163 (92)	54 (9)	412 (98)	1474 (87)	582 (100)	3685	81
1979	2702 (96)	239 (27)	465 (99)	2325 (100)	722 (99)	6453	90
1980*	3486 (98)	578 (41)	817 (98)	4457 (100)	1343 (100)	10,681	93
TOTAL	13,818 (82)	2,198 (41)	5,396 (99)	15,253 (96)	6,785 (100)	43,450	86

* Provisional

Table 4. Nominal catch by month of white hake in Div. 4T 1972-1980

YEAR	MONTH J	F	M	A	M	J	J	A	S	O	N	D	TOTAL
1972	1	2	-	11	52	391	1275	1693	1164	873	278	16	5756
1973	-	-	-	9	53	567	1477	1363	1420	696	114	3	5702
1974	-	-	-	4	38	228	1376	923	434	426	181	6	3616
1975	1	-	-	-	54	352	1270	1040	866	384	151	7	4125
1976	10	3	-	15	70	249	1097	855	949	469	41	-	3758
1977	-	-	-	1	68	550	1211	905	654	363	231	1	3984
1978	-	-	-	-	32	543	1178	1116	874	456	363	-	4561
1979	-	-	-	-	53	685	2052	1656	1147	823	810	14	7240
1980*	-	-	-	-	53	595	3234	3063	1538	2097	1019	20	11619
TOTAL	12	5	-	40	473	4160	14170	12614	9046	6587	3189	67	50361
% OF TOTAL LANDINGS	0	0	0	0	1	9	28	25	19	12	6	0	100

* Provisional

Table 5. Percentage of total catch in different strata of white hake during research cruises, 1971 - 1980.

STRATUM	YEAR									
	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
15	1	6	1	5	12	11	32	5	10	14
20	4	15	13	4	1	5	7	26	10	8
21	2	35	1	1	1	20	2	2	5	10
25	20	16	2	8	8	10	16	6	3	6
32	10	11	5	8	55	1	14	10	10	6
33	18	2	72	66	2	45	9	40	37	23
37	10	3	0	3	4	6	6	6	1	2
TOTAL	65	88	94	95	84	98	86	95	76	69

Table 6. White Hake in NAFO Div. 4T. Research abundance indices for 1970 - 1980.

STRATUM	YEAR										
	1970 *	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
15	-	0.46	2.50	1.46	-	26.84	20.68	30.02	12.85	19.15	25.80
20	1.54	3.03	6.18	20.28	12.35	1.55	9.56	6.77	62.93	18.81	14.69
21	2.93	2.52	32.52	4.81	7.50	5.35	87.50	3.54	12.66	22.00	40.54
25	-	17.45	7.71	4.14	27.21	22.17	23.75	18.01	19.21	5.99	12.96
32	-	18.90	11.64	21.23	59.60	312.52	6.18	33.06	66.47	52.67	30.82
33	-	8.13	.65	72.34	118.49	2.77	54.74	5.12	63.39	47.06	26.51
NUM/TOW 15-39	0.59	2.68	1.52	5.92	10.45	8.39	7.06	3.50	9.95	7.46	6.85
MED3R	0.59	1.52	2.68	5.92	8.39	8.39	7.06	7.06	7.46	7.46	6.85
KG/TOW 15-39	1.67	2.13	2.98	7.82	12.99	5.35	4.23	3.25	10.98	9.56	9.71
MED3R	1.67	2.13	2.98	7.82	7.82	5.35	4.23	4.23	9.56	9.71	9.71

*Strata 15, 25, 32, and 33 inclusive were not surveyed in 1970.

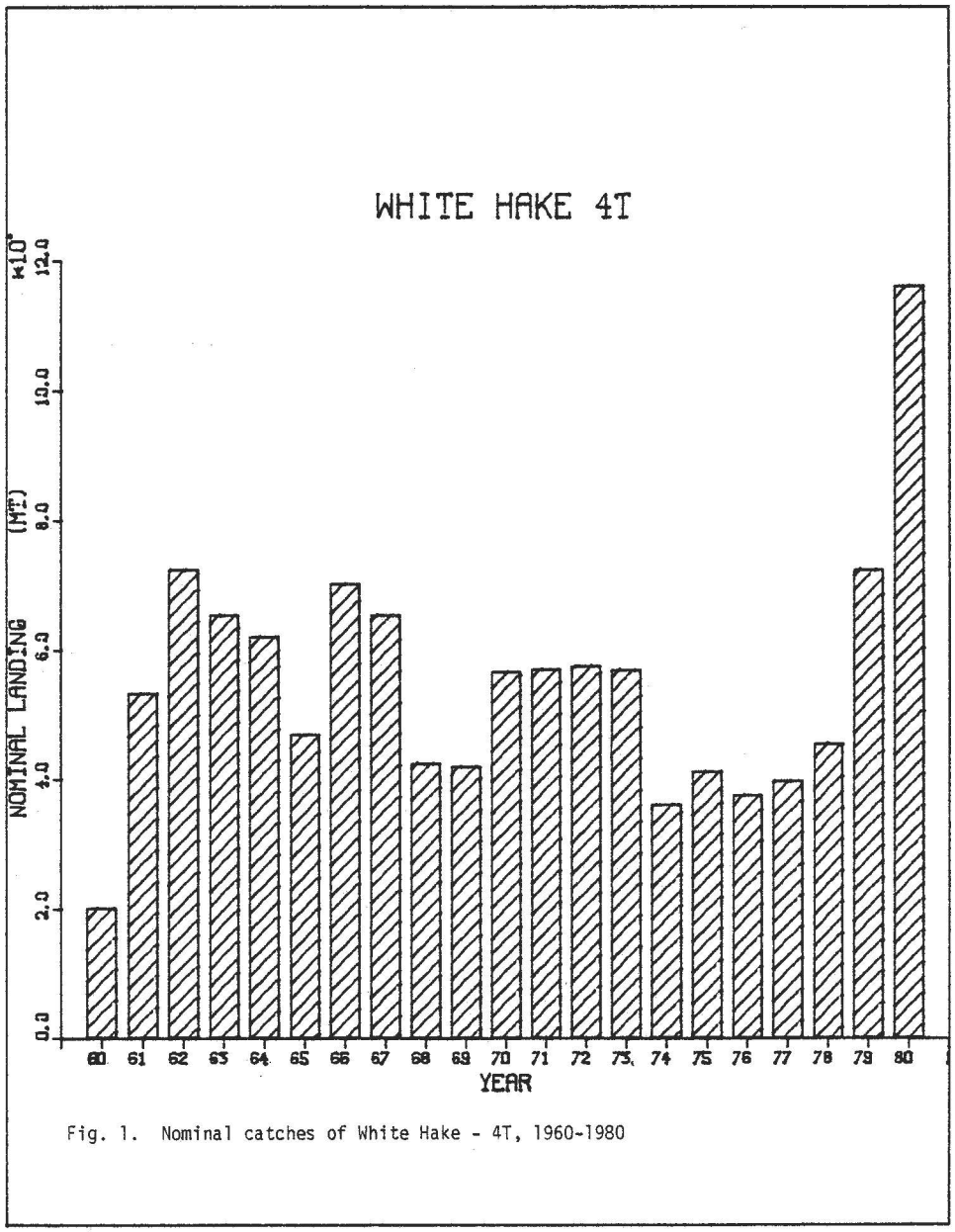

Fig. 1. Nominal catches of White Hake - 4T, 1960-1980

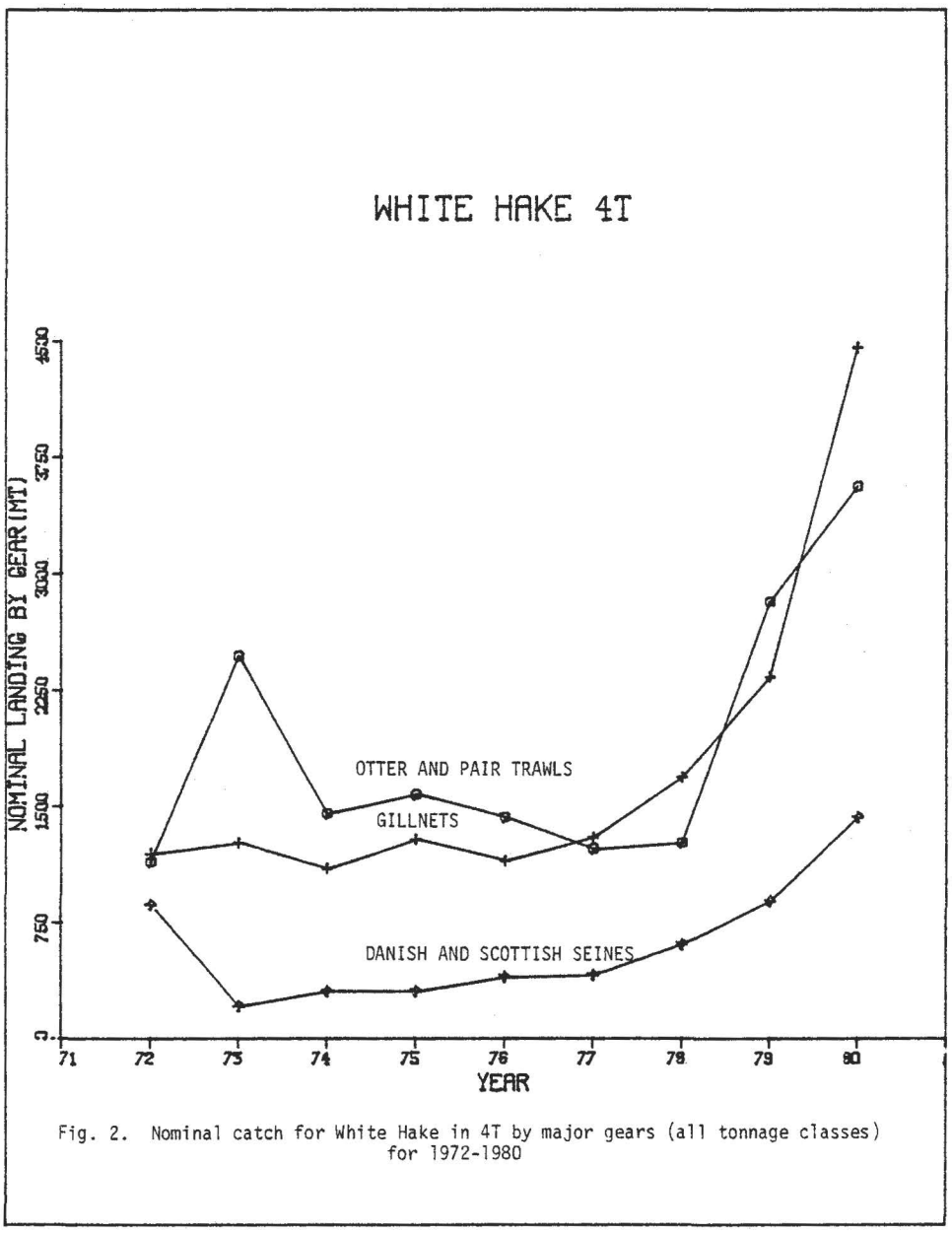

Fig. 2. Nominal catch for White Hake in 4T by major gears (all tonnage classes) for 1972-1980

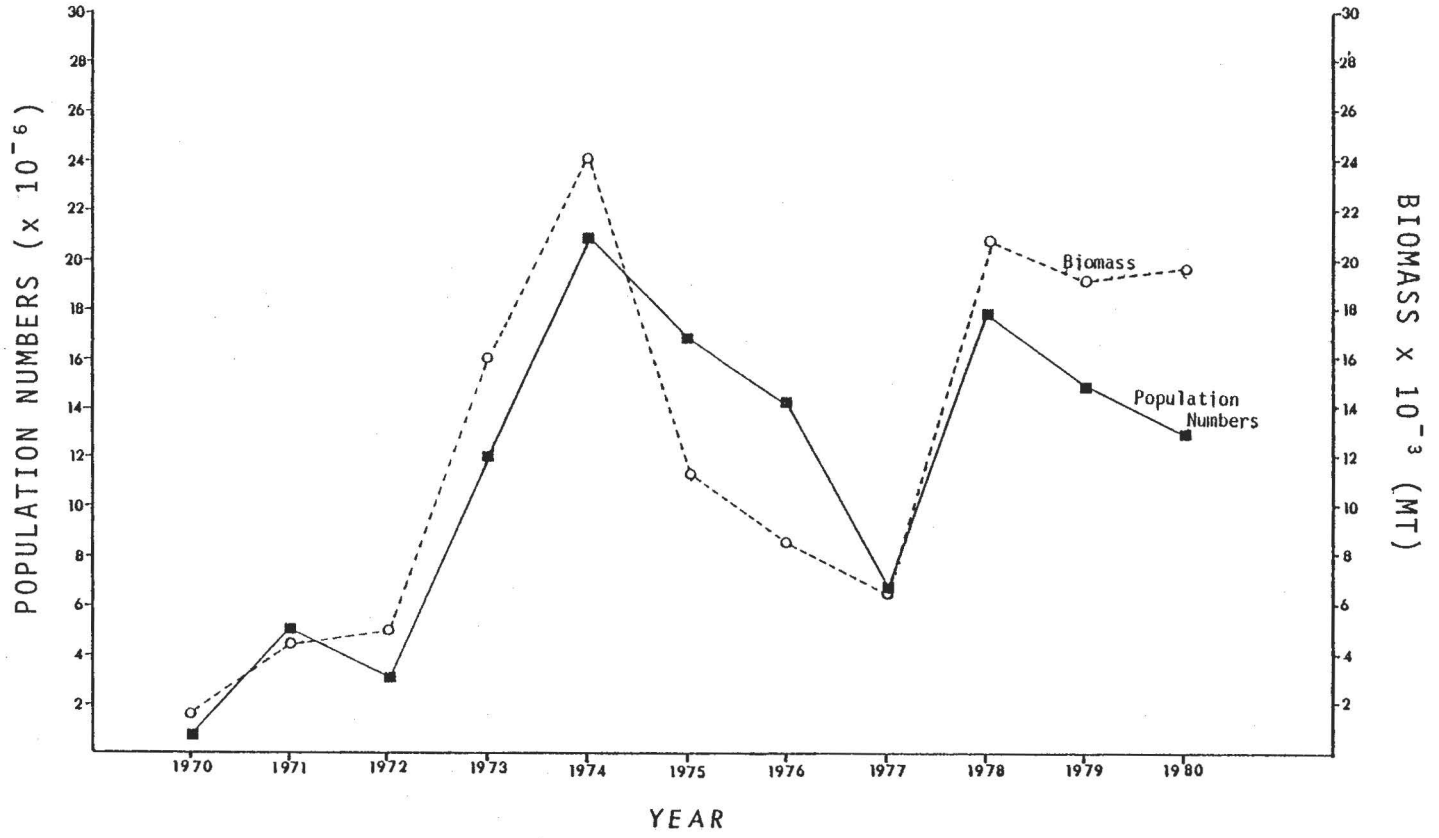

Figure 3. Estimated population (numbers x 10^{-6}), and biomass for White Hake in Division 4T from research cruises.

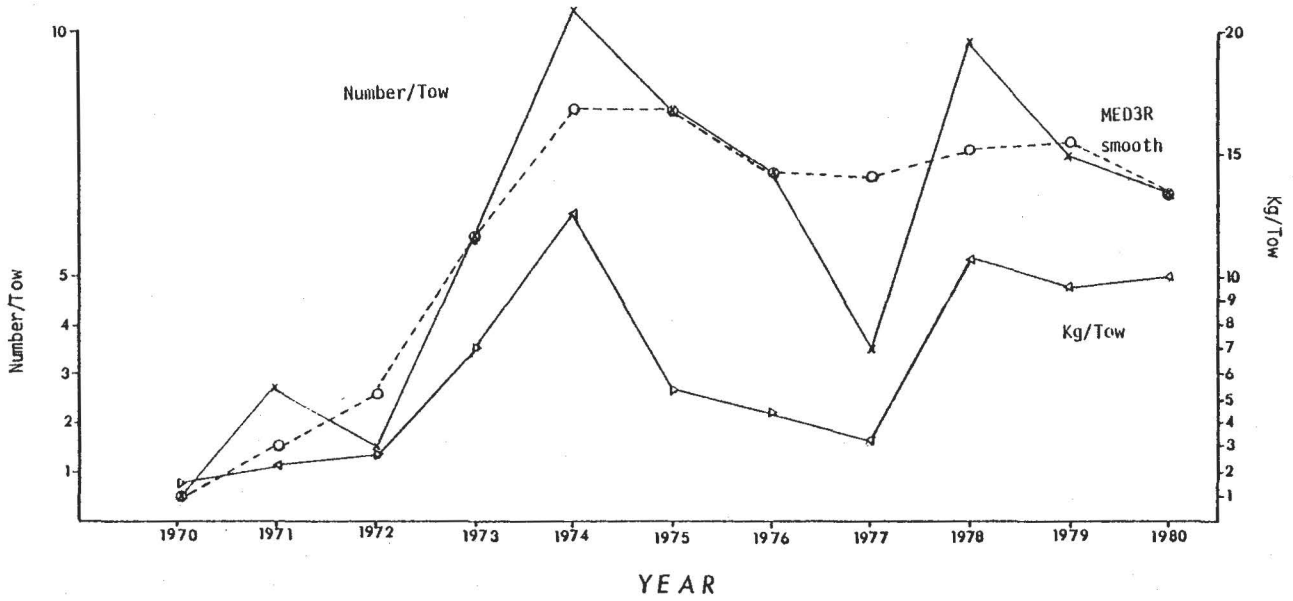

Fig. 4. Research CPUE (Kg/Tow) and (Number/Tow) of White hake in 4T for 1970-1980.