

PRELIMINARY ANALYSIS OF CATCH AND EFFORT DATA FOR THE
CANADIAN BLUEFIN TUNA ROD AND REEL FISHERY

P. Hurley, G. Black, C. Burnett, T. D. Iles

SUMMARY

Preliminary analysis of logbooks from the Canadian bluefin tuna rod-and-reel fishery is presented and discussed. Brief conclusions are drawn and direction of final analysis indicated.

RESUMEN

Se presentaron y debatieron análisis preliminares de los cuadernos de bitácora de la pesquería canadiense de caña y carrete del atún rojo. Se sacaron conclusiones breves, se indica la dirección de los análisis finales.

RESUME

Le présent document fait un exposé critique des analyses préliminaires des des livres de bord de la pêcherie canadienne au thon rouge à la canne et au moulinet. On mentionne brièvement quelques conclusions qui en ont été tirées, ainsi que l'orientation des dernières analyses.

INTRODUCTION

Sport fishing for large bluefin tuna in Canadian waters started in 1935 off Wedgeport, N.S., and spread to other areas as abundances changed and as the popularity of sport fishing increased. Sport fishing began off Newfoundland in 1957 in Conception Bay and later spread to Notre Dame Bay. It began off Prince Edward Island in 1967 and in Chaleur Bay in 1973. The development of lucrative markets in recent years has strengthened interest in these fisheries. Figure 1 illustrates areas along the Canadian Atlantic coast where rod and reel fishing for bluefin tuna has existed or does exist now. Hurley and Iles (1979) summarize historical catches and changes in fishing patterns.

Regulations were introduced in 1975 as part of measures to restrict fishing mortality in compliance with ICCAT recommendations. Each vessel was issued a special bluefin tuna rod and reel license and the number of licenses was fixed. New fishermen could only enter the fishery through a lottery for vacated licenses. Ten-week open seasons were established for each of 11 areas. The maximum catch per boat per day was restricted to two fish and only one hook and one 130-lb test line could be fished at one time. Night fishing was prohibited for reasons of safety.

Each vessel was required to complete a fishing log daily and submit these on a weekly basis. The following information is required in a daily log entry: date, position, hours on ground, number of strikes, weight and flank length of fish caught, time fish hooked and time fish boated, angler's name and address, port fish sold and buyer, number of crew, captain's name and vessel identification.

The log books were sent to St. Andrews for analysis. This information has been compiled for the years 1975-1978. For the log records for 1977 and

1978, fishing locations were translated into latitudes and longitudes by means of a digitizer and that information was also stored.

OBJECTIVES

The ultimate objectives of this study are twofold. The first is to determine whether it is possible to produce an index of abundance for the bluefin tuna population exploited by these fisheries. The second is to relate the sport fish population to the larger population units that might include the northwest Atlantic or the northwest and northeast Atlantic populations. If this is possible, then it can represent independent evidence for best values of input parameters for VPA analysis for most recent years. We may therefore be able to provide relative estimates of population size over this period at least, over the size range of the sport fishery.

RESULTS

Monthly summaries are presented in Tables 1-4 and weekly summaries in Tables 5-8. Plots of 1977 and 1978 Prince Edward Island fishing locations are presented in Figures 2 and 4, respectively. The distribution of catch and effort by 10' by 10' squares is presented for 1977 and 1978 Prince Edward Island in Figures 3 and 5-13. Estimates of coverage of the fisheries by log books range from 87-94% by catch and 92-99% by effort. This is the first attempt at analysis of the results and will determine what details are examined in more depth as the database is enlarged. The 1979 log records are being compiled at this time and catch locations for 1975, 1976, and 1979

are being translated into latitudes and longitudes.

A number of different CPUE units have been calculated, as shown in the tables and figures, but it is not immediately obvious which one is most reliable. It is believed that catch per day fishing on grounds is, by nature of the data, more reliable than catch per hour on fishing grounds. Whether this is due to a problem in reporting cannot be determined from the data and is being evaluated by other means.

Some of the crude CPUE units indicate lower abundance in 1975 than in subsequent years. It is very likely that this can be accounted for by learning factors. For example, Figure 14 shows a marked shift from 1975 to 1978 towards boats which fish for the entire season. This may indicate much more "directed" effort by this portion of the fleet and implies average fleet experience has increased. This is also implied by the decrease from 1975 to 1978 in the number of strikes required to boat each fish as seen in Tables 1-4. Another obvious aspect of efficiency requiring investigation is the improvement in knowledge of the behaviour of bluefin tuna in these areas.

It is clear that there are differences in areal and seasonal patterns of distribution of fish, differences between the activities of boats from different ports and differences between individual boats. Analysis of these differences is continuing in the hope that they can be corrected for, or that subsamples of log book information can be shown to give a more reliable estimate of CPUE. However, it is unlikely that a proper evaluation of reliability of abundance indices in this fishery will be possible without a full analysis of the relevant biology. It is planned that such an analysis will be complete by the time of the next SCRS meeting.

REFERENCES

Hurley, P. C. F., and T. D. Iles. 1979. A brief description of Canadian fisheries for Atlantic bluefin tuna. ICCAT WGBF/79/19, 19 p.

Table 1. 1975 monthly summaries from bluefin tuna rod and reel log records.

Prov.	Month	No. fish	No. strikes	No. days	No. hours	No. fish /10 days	No. fish /100 hours	No. strikes /fish	No. boats
PEI	July	5	12	69	514	.725	.972	2.40	7
	Aug.	75	181	1102	8173	.618	.912	2.41	83
	Sept.	246	521	1931	15346	1.274	1.603	2.12	116
	Oct.	12	26	216	1729	.556	.694	2.17	79
	Nov.	-	-	-	-	-	-	-	-
	Total		338	740	3318	25762	1.019	1.312	2.19
NS	July	1	1	3	12	3.333	8.333	1.0	2
	Aug.	1	4	134	1149	.075	.087	4.0	18
	Sept.	1	62	159	1302	.063	.077	62.0	25
	Oct.	0	0	2	16	0	0	0	1
	Nov.	0	0	2	12	0	0	0	1
	Total		3	67	300	2491	.100	.120	22.33
NB/PQ	July	-	-	-	-	-	-	-	-
	Aug.	67	231	260	1518	2.577	4.413	3.45	33
	Sept.	58	132	275	1645	2.109	3.525	2.28	34
	Oct.	1	3	15	91	.667	1.099	3.00	5
	Nov.	-	-	-	-	-	-	-	-
	Total		126	366	550	3254	2.291	3.871	2.90
Total	July	6	13	72	526	.833	1.141	2.17	9
	Aug.	143	416	1496	10840	.956	1.319	2.91	134
	Sept.	305	715	2365	18293	1.290	1.667	2.34	175
	Oct.	13	29	233	1836	.558	.708	2.23	85
	Nov.	0	0	2	12	0	0	0	1
	Total		467	1173	4168	31507	1.120	1.482	2.51

Table 2. 1976 monthly summaries from bluefin tuna rod and reel log records.

Area	Month	No. fish	No. strikes	No. days	No. hours	No. fish /10 days	No. fish /100 hours	No. strikes /fish	No. boats
PEI	July	0	4	74	577	0	0	0	10
	Aug.	264	464	1630	13242	1.620	1.994	1.76	121
	Sept.	222	396	2270	18507	.978	1.200	1.78	119
	Oct.	171	266	939	7646	1.821	2.237	1.56	105
	Nov.	-	-	-	-	-	-	-	-
Total	657	1130	4913	39972	1.337	1.644	1.72	129	
NS	July	-	-	-	-	-	-	-	-
	Aug.	0	0	13	101	0	0	0	4
	Sept.	0	0	28	223	0	0	0	7
	Oct.	0	1	19	142	0	0	0	3
	Nov.	-	-	-	-	-	-	-	-
Total	0	1	60	466	0	0	0	10	
NB/PQ	July	0	2	10	93	0	0	0	1
	Aug.	83	254	320	1965	2.594	4.225	3.06	39
	Sept.	78	183	386	2375	2.021	3.285	2.35	35
	Oct.	6	7	40	276	1.500	2.178	1.17	11
	Nov.	-	-	-	-	-	-	-	-
Total	167	446	756	4709	2.209	3.612	2.67	40	
Total	July	0	6	84	670	0	0	0	11
	Aug.	347	718	1963	15308	1.768	2.267	2.07	164
	Sept.	300	579	2684	21105	1.118	1.422	1.93	161
	Oct.	177	274	998	8064	1.774	2.195	1.55	119
	Nov.	-	-	-	-	-	-	-	-
Total	824	1577	5729	45147	1.438	1.825	1.91	179	

Table 3. 1977 monthly summaries from bluefin tuna rod and reel log records.

Area	Month	No. fish	No. strikes	No. days	No. hours	No. fish /10 days	No. fish /100 hours	No. strikes /fish	No. boats
PEI	July	0	0	22	176	0	0	0	4
	Aug.	130	221	1854	15024	.700	.865	1.70	124
	Sept.	203	344	1874	14864	1.083	1.366	1.69	124
	Oct.	105	179	1066	7750	.985	1.355	1.70	102
	Nov.	0	0	2	12	0	0	0	1
Total	438	744	4818	37826	.909	1.158	1.70	126	
NS	July	-	-	-	-	-	-	-	-
	Aug.	0	0	58	468	0	0	0	8
	Sept.	1	1	27	171	.370	.585	1.00	5
	Oct.	0	3	24	153	0	0	0	4
	Nov.	9	26	16	101	5.625	8.929	2.89	3
Total	10	30	125	893	.800	1.121	3.00	11	
NB/PQ	July	3	10	22	172	1.364	1.744	3.33	2
	Aug.	145	327	549	3485	2.641	4.161	2.26	38
	Sept.	56	113	298	1965	1.879	2.849	2.02	33
	Oct.	0	3	28	145	0	0	0	8
	Nov.	-	-	-	-	-	-	-	-
Total	204	453	897	5767	2.274	3.537	2.22	39	
Total	July	3	10	44	348	.682	.862	3.33	6
	Aug.	275	548	2461	18977	1.117	1.449	1.99	170
	Sept.	260	458	2199	17000	1.182	1.529	1.76	162
	Oct.	105	185	1118	8048	.939	1.305	1.76	114
	Nov.	9	26	18	113	5.000	7.965	2.89	4
Total	652	1227	5840	44486	1.116	1.466	1.86	176	

Table 4. 1978 monthly summaries from bluefin tuna rod and reel log records.

Area	Month	No. fish	No. strikes	No. days	No. hours	No. fish /10 days	No. fish /100 hours	No. strikes /fish	No. boats
PEI	July	2	2	44	338	.455	.592	1.00	10
	Aug.	147	214	1735	13142	.847	1.119	1.46	123
	Sept.	219	296	1846	13168	1.186	1.663	1.35	126
	Oct.	58	91	1041	8067	.557	.719	1.57	99
	Nov.	-	-	-	-	-	-	-	-
	Total	426	603	4666	34715	.913	1.227	1.42	127
NS	July	0	2	16	100	0	0	0	3
	Aug.	1	1	15	90	.667	1.117	1.00	2
	Sept.	1	2	9	45	1.111	2.237	2.00	2
	Oct.	1	3	47	270	.213	.371	3.00	4
	Nov.	15	53	31	210	4.839	7.143	3.53	4
	Total	18	61	118	715	1.515	2.521	3.39	7
NB/PQ	July	0	0	7	49	0	0	0	1
	Aug.	15	32	368	2516	.408	.596	2.13	26
	Sept.	15	24	118	833	1.271	1.801	1.60	20
	Oct.	0	0	23	177	0	0	0	4
	Nov.	-	-	-	-	-	-	-	-
	Total	30	56	516	3575	.581	.839	1.87	27
Total	July	2	4	67	487	.299	.411	2.00	14
	Aug.	163	247	2118	15748	.769	1.035	1.52	151
	Sept.	235	322	1973	14046	1.191	1.673	1.37	148
	Oct.	59	94	1111	8514	.531	.693	1.59	107
	Nov.	15	53	31	210	4.839	7.143	3.53	4
	Total	474	720	5300	39005	.894	1.215	1.52	161

Table 5a. 1975 weekly summaries from bluefin tuna rod and reel log records.

Area	Week	No. fish	No. strikes	No. days on ground	No. hours on ground	No. fish /10 days	No. fish /100 hours	No. strikes /fish	No. boats	
PEI	26	-	-	-	-	-	-	-	-	
	27	0	0	5	40	0	0	0	1	
	28	0	0	11	85	0	0	0	4	
	29	0	2	21	160	0	0	0	5	
	30	2	4	19	140	1.053	1.429	2.00	5	
	31	6	16	102	759	.588	.791	2.67	54	
	32	7	24	261	1869	.268	.375	3.43	58	
	33	11	25	261	1968	.421	.559	2.27	62	
	34	9	26	171	1177	.526	.765	2.89	65	
	35	36	82	296	2327	1.216	1.547	2.28	72	
	36	63	138	323	2576	1.950	2.446	2.19	85	
	37	37	81	388	2858	.954	1.295	2.19	89	
	38	66	124	555	4577	1.189	1.442	1.88	99	
	39	70	151	532	4394	1.316	1.593	2.16	95	
	40	27	59	316	2425	.854	1.113	2.19	86	
	41	4	8	57	409	.702	.978	2.00	47	
	42	-	-	-	-	-	-	-	-	
	43	-	-	-	-	-	-	-	-	
	44	-	-	-	-	-	-	-	-	
	45	-	-	-	-	-	-	-	-	
	46	-	-	-	-	-	-	-	-	
	Total	338	740	3318	25762	1.019	1.312	2.19	124	
	NS	26	-	-	-	-	-	-	-	-
		27	-	-	-	-	-	-	-	-
		28	-	-	-	-	-	-	-	-
		29	-	-	-	-	-	-	-	-
30		0	0	2	6	0	0	0	1	
31		1	1	2	8	5.000	12.500	1.00	2	
32		0	0	5	41	0	0	0	2	
33		0	0	17	152	0	0	0	4	
34		1	2	28	257	.357	.389	2.00	9	
35		0	2	76	639	0	0	0	16	
36		1	62	110	926	.091	1.108	62.00	21	
37		0	0	44	353	0	0	0	12	
38		0	0	9	69	0	0	0	6	
39		0	0	3	12	0	0	0	2	
40		-	-	-	-	-	-	-	-	
41	-	-	-	-	-	-	-	-		
42	-	-	-	-	-	-	-	-		
43	0	0	1	8	0	0	0	1		
44	0	0	1	8	0	0	0	1		
45	0	0	1	6	0	0	0	1		
46	0	0	1	6	0	0	0	1		
Total	3	67	300	2491	.100	.120	22.33	30		

Table 5b. 1975 weekly summaries from bluefin tuna rod and reel log records.

Area	Week	No. fish	No. strikes	No. days on ground	No. hours on ground	No. fish /10 days	No. fish /100 hours	No. strikes /fish	No. boats
NB/PQ	26	-	-	-	-	-	-	-	-
	27	-	-	-	-	-	-	-	-
	28	-	-	-	-	-	-	-	-
	29	-	-	-	-	-	-	-	-
	30	-	-	-	-	-	-	-	-
	31	13	31	24	136	5.417	9.559	2.38	15
	32	5	31	36	204	1.389	2.451	6.20	14
	33	23	81	79	461	2.911	4.989	3.52	21
	34	9	29	47	275	1.915	3.273	3.22	20
	35	11	42	59	348	1.864	3.161	3.82	26
	36	30	90	85	512	3.529	5.859	3.00	29
	37	12	26	60	317	2.000	3.786	2.17	23
	38	22	31	79	499	2.785	4.409	1.41	26
	39	0	2	54	334	0	0	0	15
	40	1	3	22	138	.455	.725	3.00	9
	41	0	0	5	32	0	0	0	3
	42	-	-	-	-	-	-	-	-
	43	-	-	-	-	-	-	-	-
	44	-	-	-	-	-	-	-	-
	45	-	-	-	-	-	-	-	-
	46	-	-	-	-	-	-	-	-
Total		126	366	550	3254	2.291	3.872	2.90	36
Total	26	-	-	-	-	-	-	-	-
	27	0	0	5	40	0	0	0	1
	28	0	0	11	85	0	0	0	4
	29	0	2	21	160	0	0	0	5
	30	2	4	21	146	.952	1.370	2.00	6
	31	20	48	128	903	1.563	2.215	2.40	71
	32	12	55	302	2114	.397	.568	4.58	74
	33	34	106	357	2581	.952	1.317	3.12	87
	34	19	57	246	1709	.772	1.112	3.00	94
	35	47	126	431	3314	1.090	1.418	2.68	114
	36	94	290	518	4014	1.815	2.342	3.09	135
	37	49	107	492	3528	.996	1.389	2.18	124
	38	88	155	643	5145	1.369	1.710	1.76	131
	39	70	153	589	4740	1.188	1.477	2.19	112
	40	28	62	338	2563	.828	1.092	2.21	95
	41	4	8	62	441	.645	.907	2.00	50
	42	-	-	-	-	-	-	-	-
	43	0	0	1	8	0	0	0	1
	44	0	0	1	8	0	0	0	1
	45	0	0	1	6	0	0	0	1
	46	0	0	1	6	0	0	0	1
Total		467	1173	4168	31507	1.120	1.482	2.51	190

Table 6a. 1976 weekly summaries from bluefin tuna rod and reel log records.

Area	Week	No. fish	No. strikes	No. days on ground	No. hours on ground	No. fish /10 days	No. fish /100 hours	No. strikes /fish	No. boats
PEI	26	-	-	-	-	-	-	-	-
	27	-	-	-	-	-	-	-	-
	28	0	3	9	68	0	0	0	9
	29	0	0	29	224	0	0	0	8
	30	0	1	27	216	0	0	0	6
	31	0	0	9	69	0	0	0	3
	32	2	2	17	128	1.176	.156	1.00	5
	33	22	31	318	2370	.692	.928	1.41	85
	34	145	267	570	4935	2.544	2.938	1.84	111
	35	82	134	537	4402	1.527	1.863	1.63	115
	36	63	112	559	4647	1.127	1.356	1.78	112
	37	39	60	456	3543	.855	1.101	1.54	106
	38	51	81	587	4925	.869	1.036	1.59	106
	39	59	111	558	4690	1.057	1.258	1.88	101
	40	43	97	478	3596	.900	1.196	2.26	103
	41	73	114	444	3701	1.644	1.972	1.56	97
	42	75	109	249	2107	3.012	3.560	1.45	80
	43	3	7	69	320	.435	.938	2.33	49
	44	0	1	4	33	0	0	0	2
	45	-	-	-	-	-	-	-	-
	46	-	-	-	-	-	-	-	-
Total		657	1130	4920	39972	1.335	1.644	1.72	129
NS	26	-	-	-	-	-	-	-	-
	27	-	-	-	-	-	-	-	-
	28	-	-	-	-	-	-	-	-
	29	-	-	-	-	-	-	-	-
	30	-	-	-	-	-	-	-	-
	31	-	-	-	-	-	-	-	-
	32	0	0	1	5	0	0	0	1
	33	-	-	-	-	-	-	-	-
	34	0	0	4	34	0	0	0	2
	35	0	0	5	39	0	0	0	3
	36	0	0	9	73	0	0	0	4
	37	0	0	12	94	0	0	0	3
	38	0	0	4	31	0	0	0	2
	39	0	0	5	41	0	0	0	3
	40	0	0	2	17	0	0	0	2
	41	0	1	10	81	0	0	0	3
	42	0	0	5	35	0	0	0	1
	43	0	0	3	17	0	0	0	1
	44	-	-	-	-	-	-	-	-
	45	-	-	-	-	-	-	-	-
	46	-	-	-	-	-	-	-	-
Total		0	1	60	466	0	0	0	10

Table 6b. 1976 weekly summaries from bluefin tuna rod and reel log records.

Area	Week	No. fish	No. strikes	No. days on ground	No. hours on ground	No. fish /10 days	No. fish /100 hours	No. strikes /fish	No. boats
NB/PQ	26	-	-	-	-	-	-	-	-
	27	-	-	-	-	-	-	-	-
	28	-	-	-	-	-	-	-	-
	29	-	-	-	-	-	-	-	-
	30	0	0	3	25	0	0	0	1
	31	0	2	7	68	0	0	0	1
	32	0	1	10	69	0	0	0	2
	33	8	40	44	251	1.818	3.187	5.00	19
	34	34	89	107	717	3.178	4.742	2.62	31
	35	23	79	110	648	2.091	3.549	3.43	29
	36	44	89	126	785	3.492	5.605	2.02	34
	37	23	49	110	681	2.091	3.377	2.13	34
	38	10	28	94	569	1.064	1.757	2.80	27
	39	19	59	81	478	2.346	3.975	3.11	20
	40	2	5	30	181	.667	1.105	2.50	13
	41	4	5	26	166	1.538	2.410	1.25	10
	42	0	0	8	72	0	0	0	2
	43	-	-	-	-	-	-	-	-
	44	-	-	-	-	-	-	-	-
	45	-	-	-	-	-	-	-	-
	46	-	-	-	-	-	-	-	-
Total		167	446	756	4709	2.209	3.546	2.67	40
Total	26	-	-	-	-	-	-	-	-
	27	-	-	-	-	-	-	-	-
	28	0	3	9	68	0	0	0	9
	29	0	0	29	224	0	0	0	8
	30	0	1	30	241	0	0	0	7
	31	0	2	16	137	0	0	0	4
	32	2	3	28	202	.714	.990	1.50	8
	33	30	71	362	2621	.829	1.145	2.37	104
	34	179	356	681	5686	2.628	3.148	1.99	144
	35	105	213	652	5089	1.610	2.063	2.03	147
	36	107	201	694	5505	1.542	1.944	1.88	150
	37	62	109	578	4318	1.073	1.436	1.76	143
	38	61	109	685	5525	.891	1.104	1.79	135
	39	78	170	644	5209	1.211	1.497	2.18	124
	40	45	102	510	3794	.882	1.186	2.27	118
	41	77	120	480	3948	1.604	1.950	1.56	110
	42	75	109	262	2214	2.863	3.388	1.45	83
	43	3	7	72	337	.417	.890	2.33	50
	44	0	1	4	33	0	0	0	2
	45	-	-	-	-	-	-	-	-
	46	-	-	-	-	-	-	-	-
Total		824	1577	5736	45147	1.437	1.825	1.91	179

Table 7a. 1977 weekly summaries from bluefin tuna rod and reel log records.

Area	Week	No. fish	No. strikes	No. days on ground	No. hours on ground	No. fish /10 days	No. fish /100 hours	No. strikes /fish	No. boats
PEI	26	-	-	-	-	-	-	-	-
	27	-	-	-	-	-	-	-	-
	28	-	-	-	-	-	-	-	-
	29	0	0	1	6	0	0	0	1
	30	0	0	5	46	0	0	0	1
	31	0	0	15	116	0	0	0	4
	32	3	3	21	162	1.429	1.852	1.00	6
	33	38	68	345	2858	1.101	1.330	1.79	108
	34	35	49	578	4611	.606	.759	1.40	112
	35	30	53	569	4651	.527	.645	1.77	113
	36	56	100	634	5178	.883	1.082	1.79	118
	37	78	136	535	4251	1.458	1.835	1.74	115
	38	20	35	283	2019	.707	.991	1.75	104
	39	19	35	382	3065	.497	.620	1.84	110
	40	59	100	469	3795	1.258	1.555	1.69	109
	41	69	119	499	4056	1.383	1.701	1.72	99
	42	30	45	345	2545	.779	1.179	1.50	89
	43	1	1	28	397	.114	.252	1.00	47
	44	0	0	7	62	0	0	0	1
	45	0	0	2	12	0	0	0	1
	46	-	-	-	-	-	-	-	-
Total		438	744	4818	37826	.909	1.158	1.70	126
NS	26	-	-	-	-	-	-	-	-
	27	-	-	-	-	-	-	-	-
	28	-	-	-	-	-	-	-	-
	29	-	-	-	-	-	-	-	-
	30	-	-	-	-	-	-	-	-
	31	-	-	-	-	-	-	-	-
	32	0	0	12	96	0	0	0	4
	33	0	0	14	128	0	0	0	4
	34	0	0	16	126	0	0	0	7
	35	0	0	9	65	0	0	0	4
	36	0	0	10	78	0	0	0	4
	37	1	1	10	63	1.000	1.587	1.00	4
	38	0	0	8	47	0	0	0	4
	39	0	0	3	16	0	0	0	2
	40	0	0	8	63	0	0	0	4
	41	0	3	11	50	0	0	0	4
	42	0	0	3	20	0	0	0	3
	43	0	0	2	16	0	0	0	1
	44	0	0	2	16	0	0	0	1
	45	5	12	12	79	4.167	6.329	2.40	3
	46	4	14	5	30	8.000	13.333	3.50	2
Total		10	30	125	893	.800	1.120	3.00	11

Table 7b. 1977 weekly summaries from bluefin tuna rod and reel log records.

Area	Week	No. fish	No. strikes	No. days on ground	No. hours on ground	No. fish /10 days	No. fish /100 hours	No. strikes /fish	No. boats
NB/PQ	26	-	-	-	-	-	-	-	-
	27	-	-	-	-	-	-	-	-
	28	-	-	-	-	-	-	-	-
	29	-	-	-	-	-	-	-	-
	30	3	5	9	69	3.333	4.348	1.67	2
	31	0	4	12	93	0	0	0	2
	32	9	27	55	382	1.636	2.356	3.00	23
	33	31	75	150	916	2.067	3.384	2.42	32
	34	35	82	142	863	2.465	4.056	2.34	32
	35	61	127	149	965	4.094	6.321	2.08	32
	36	22	42	111	764	1.982	2.880	1.91	32
	37	31	65	108	688	2.870	4.506	2.10	28
	38	8	14	62	415	1.290	1.928	1.75	21
	39	3	8	51	330	.588	.909	2.67	17
	40	1	4	24	173	.417	.578	4.00	9
	41	0	1	14	74	0	0	0	4
	42	0	0	9	38	0	0	0	3
	43	0	0	1	2	0	0	0	1
	44	-	-	-	-	-	-	-	-
	45	-	-	-	-	-	-	-	-
	46	-	-	-	-	-	-	-	-
Total		204	453	897	5767	2.274	3.537	2.22	39
Total	26	-	-	-	-	-	-	-	-
	27	-	-	-	-	-	-	-	-
	28	-	-	-	-	-	-	-	-
	29	0	0	1	6	0	0	0	1
	30	3	5	14	115	2.143	2.609	1.67	3
	31	0	4	27	209	0	0	0	6
	32	12	30	88	640	1.364	1.875	2.50	33
	33	69	143	509	3902	1.356	1.768	2.07	144
	34	70	131	736	5600	.951	1.250	1.87	151
	35	91	180	727	5681	1.252	1.602	1.98	149
	36	78	142	755	6020	1.033	1.296	1.82	154
	37	110	202	653	5002	1.685	2.199	1.84	147
	38	28	49	353	2481	.793	1.129	1.75	129
	39	22	43	436	3411	.505	.645	1.95	129
	40	60	104	501	4031	1.198	1.489	1.73	122
	41	69	123	524	4180	1.317	1.651	1.78	107
	42	30	45	397	2603	.756	1.153	1.50	95
	43	1	1	91	415	.110	.247	1.00	49
	44	0	0	9	78	0	0	0	2
	45	5	12	14	91	3.571	5.495	2.40	4
	46	4	14	5	30	8.000	13.333	3.50	2
Total		652	1227	5840	44486	1.116	1.466	1.88	176

Table 8a. 1978 weekly summaries from bluefin tuna rod and reel log records.

Area	Week	No. fish	No. strikes	No. days on ground	No. hours on ground	No. fish /10 days	No. fish /100 hours	No. strikes /fish	No. boats
PEI	26	-	-	-	-	-	-	-	-
	27	0	0	2	16	0	0	0	1
	28	0	0	5	41	0	0	0	1
	29	-	-	-	-	-	-	-	-
	30	0	0	27	205	0	0	0	9
	31	3	5	44	315	.682	.952	1.67	13
	32	30	43	266	2193	1.128	1.368	1.43	108
	33	42	60	624	4853	.673	.865	1.43	116
	34	38	57	408	3047	.931	1.247	1.50	114
	35	49	66	602	4358	.814	1.124	1.35	116
	36	21	30	322	1907	.652	1.101	1.43	110
	37	71	98	443	2983	1.603	2.380	1.38	116
	38	72	94	409	3131	1.760	2.300	1.31	110
	39	42	59	473	3601	.888	1.166	1.41	107
	40	33	54	452	3557	.730	.928	1.64	95
	41	23	33	420	3216	.548	.715	1.43	91
	42	2	4	169	1295	.118	.154	2.00	76
	43	-	-	-	-	-	-	-	-
	44	-	-	-	-	-	-	-	-
	45	-	-	-	-	-	-	-	-
	46	-	-	-	-	-	-	-	-
Total		426	603	4666	34715	.913	1.227	1.42	127
NS	26	0	0	1	3	0	0	0	1
	27	0	2	8	56	0	0	0	2
	28	0	0	2	13	0	0	0	2
	29	-	-	-	-	-	-	-	-
	30	0	0	3	15	0	0	0	2
	31	0	0	6	35	0	0	0	2
	32	0	0	5	30	0	0	0	2
	33	0	0	3	22	0	0	0	2
	34	0	0	1	6	0	0	0	1
	35	1	1	4	23	2.500	4.348	1.00	3
	36	0	0	4	17	0	0	0	2
	37	-	-	-	-	-	-	-	-
	38	-	-	-	-	-	-	-	-
	39	1	2	3	15	.333	6.667	2.00	1
	40	0	0	13	79	0	0	0	4
	41	0	0	7	41	0	0	0	3
	42	1	2	13	63	.769	1.587	2.00	4
	43	0	0	9	53	0	0	0	4
	44	2	10	16	105	1.250	1.905	5.00	4
	45	13	44	20	140	6.500	9.286	3.38	4
	46	-	-	-	-	-	-	-	-
Total		18	61	118	715	1.525	2.518	3.39	7

Table 8b. 1978 weekly summaries from bluefin tuna rod and reel log records.

Area	Week	No. fish	No. strikes	No. days on ground	No. hours on ground	No. fish /10 days	No. fish /100 hours	No. strikes /fish	No. boats
NB/PQ	26	0	0	1	8	0	0	0	1
	27	0	0	6	41	0	0	0	1
	28	-	-	-	-	-	-	-	-
	29	-	-	-	-	-	-	-	-
	30	-	-	-	-	-	-	-	-
	31	0	1	51	373	0	0	0	16
	32	2	3	92	626	.217	.320	1.50	23
	33	3	9	95	630	.316	.476	3.00	22
	34	5	8	83	565	.602	.885	1.60	22
	35	19	34	75	522	2.533	3.640	1.79	20
	36	1	1	46	294	.217	.340	1.00	17
	37	0	0	25	164	0	0	0	9
	38	0	0	12	109	0	0	0	3
	39	0	0	7	69	0	0	0	2
	40	0	0	16	119	0	0	0	4
	41	0	0	7	58	0	0	0	2
	42	-	-	-	-	-	-	-	-
	43	-	-	-	-	-	-	-	-
	44	-	-	-	-	-	-	-	-
	45	-	-	-	-	-	-	-	-
	46	-	-	-	-	-	-	-	-
Total		30	56	516	3575	.581	.839	1.87	27
Total	26	0	0	2	11	0	0	0	2
	27	0	2	16	113	0	0	0	4
	28	0	0	7	54	0	0	0	3
	29	-	-	-	-	-	-	-	-
	30	0	0	30	220	0	0	0	11
	31	3	6	101	723	.297	.415	2.00	31
	32	32	46	363	2849	.882	1.123	1.44	133
	33	45	69	722	5505	.623	.817	1.53	140
	34	43	65	492	3618	.874	1.189	1.51	137
	35	69	101	681	4903	1.013	1.407	1.46	139
	36	22	31	372	2212	.591	.992	1.41	129
	37	71	98	468	3147	1.517	2.256	1.38	125
	38	72	94	421	3240	1.710	2.222	1.31	113
	39	43	61	483	3685	.890	1.167	1.42	110
	40	33	54	481	3755	.686	.879	1.64	103
	41	23	33	434	3315	.530	.694	1.43	96
	42	3	6	182	1358	.165	.221	2.00	80
	43	0	0	9	53	0	0	0	4
	44	2	10	16	105	1.250	1.905	5.00	4
	45	13	44	20	140	6.500	9.286	3.36	4
	46	-	-	-	-	-	-	-	-
Total		474	720	5300	39005	.894	1.215	1.52	161

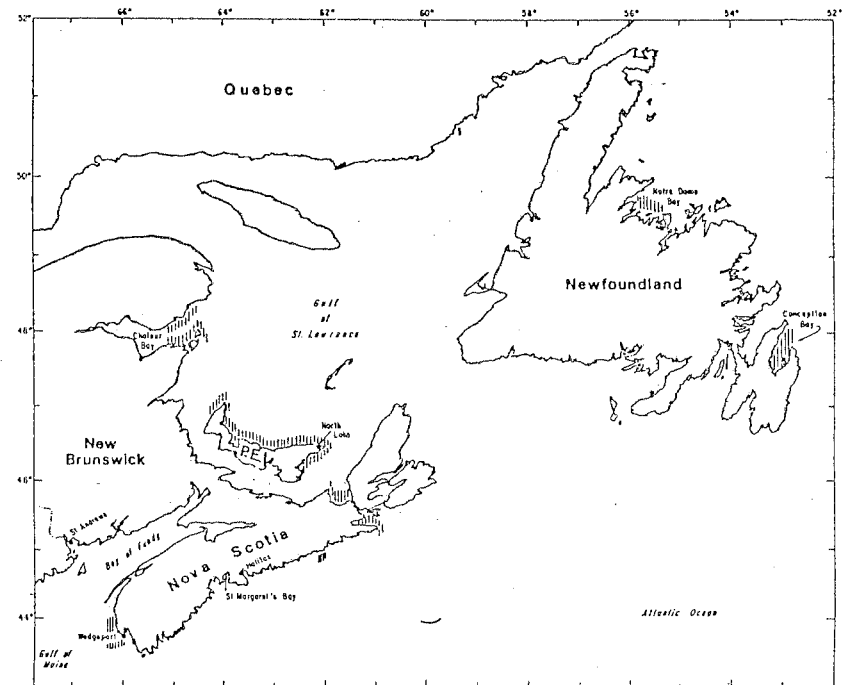


Figure 1: Fishing Locations of the Canadian Fisheries for Bluefin Tuna

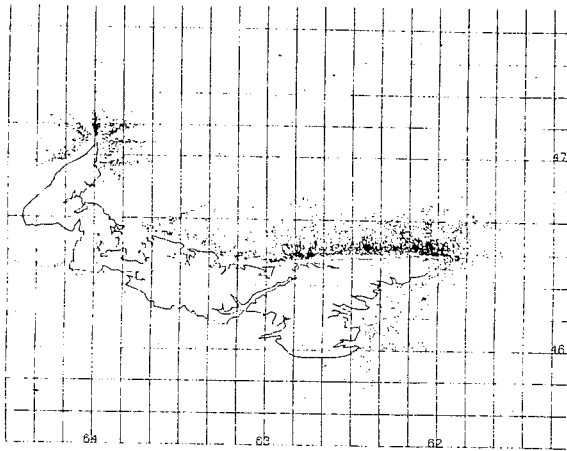


Figure 2: 1977 Season Totals Prince Edward Island Fishing Locations

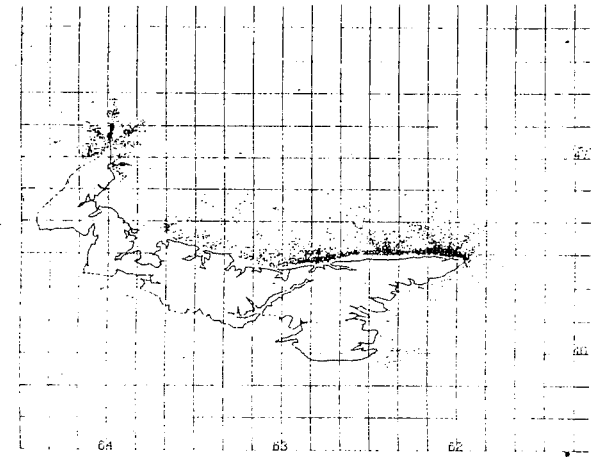


Figure 4: 1978, Season Totals Prince Edward Island Fishing Locations

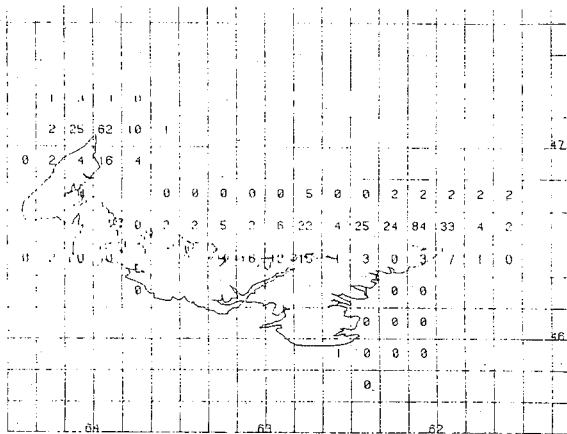


Figure 3: 1977 Season Totals Prince Edward Island Number of Fish Caught by 10' x 10' Square

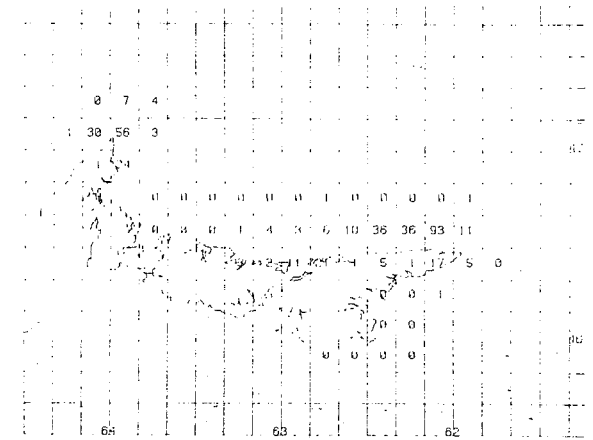


Figure 5: 1978 Season Totals Prince Edward Island Number of Fish Caught by 10' x 10' Square

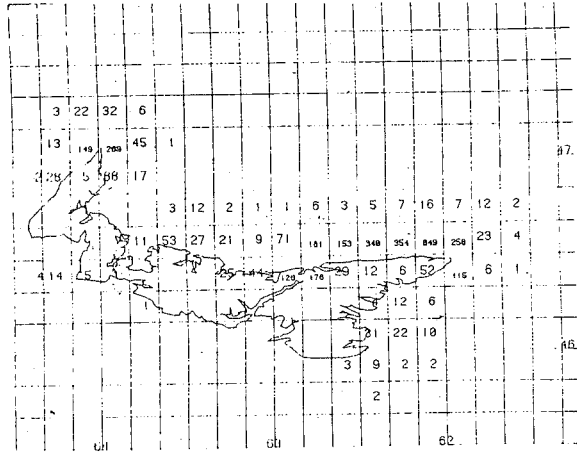


Figure 6: 1977 Season Totals Prince Edward Island
Days on Ground by 10' x 10' Square

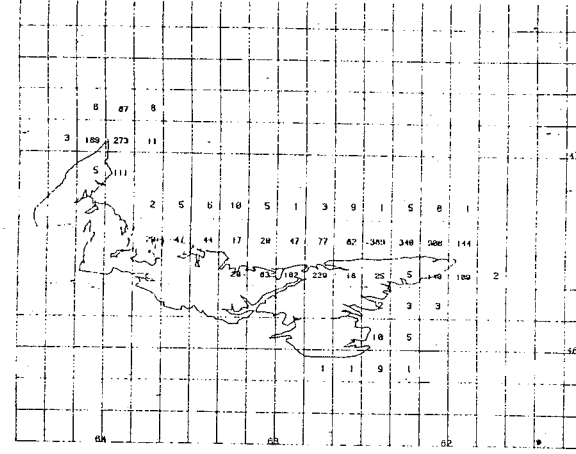


Figure 8: 1978 Season Totals Prince Edward Island
Days on Ground by 10' x 10' Square

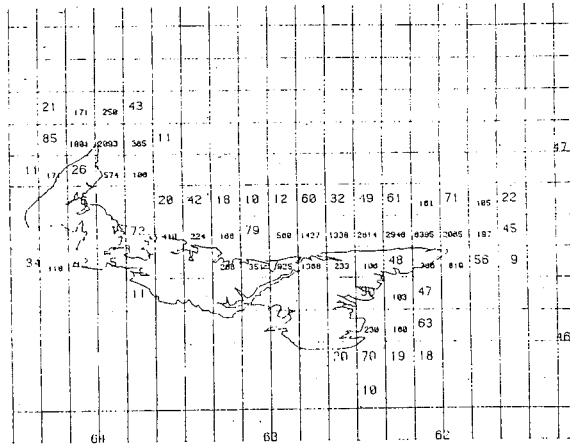


Figure 7: 1977 Season Totals Prince Edward Island
Hours on Ground by 10' x 10' Square

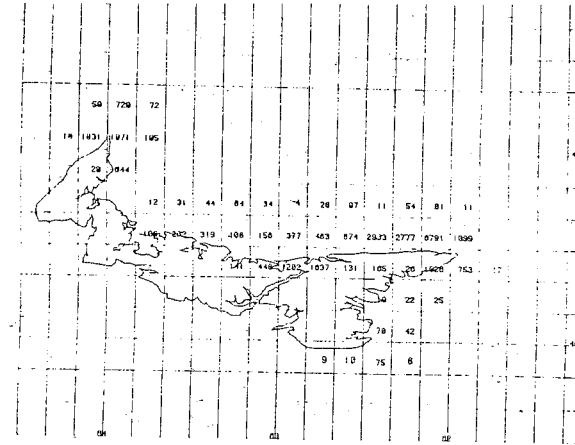


Figure 9: 1978 Season Totals Prince Edward Island
Hours on Ground by 10' x 10' Square

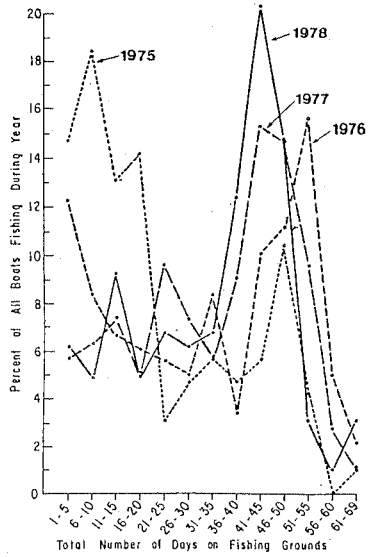


Figure 14: Frequency Distribution of Days Fished in Season (1975-1978) Expressed as Percent of all Sport Boats Fishing