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United States Report of Redfish Effort and Landings by Depth Zones for 1963

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In Table 1 are presented the effort and landings of redfish by the United States otter trawl fleet in 1963, by 50 fathom depth zones for each month and division. The first two zones actually ranged from 0-60 and 61-100 fathoms instead of the standard 50 fathoms. Landings of redfish by gear other than otter trawl were negligible. All sizes of vessels from 26 to 300 gross tons were included without weighting. The larger boats fished the northern divisions while the smaller ones fished more in the southern divisions.

Areas and depths of the catch were obtained by interviews. Landings and effort of those trips not interviewed were prorated on the basis of the activities of interviewed vessels, within port and boat size groups. This accounted for the whole of the redfish catch.

Landings from division 5Z were mainly incidental catches. Those from 5Y were the product of a mixed species fishery, and thus the lower catch-per-unit-effort found there may be partly a product of effort being directed at concentrations of fish other than redfish, particularly in the 0-60 fathom zone. The selection of only those boats that landed redfish reduced this factor to some extent.

An attempt was made to analyze these data to determine whether any significant differences existed between depth zones. In Table 2 are presented the annual average catch-per-days-fished in metric tons for both 1962 and 1963. The data for 1961 were not included because the catch-per-day for that year was calculated differently (McCann, 1963). A ranking procedure was used to examine differences between depths. Each depth zone was assigned an integral value - 1, 2, . . . , based on the rank of the catch-per-

day within each division (Table 3). The higher the rank the lower the catch-per-day. These values were summed over divisions and years and the average rank was computed (Table 4).

It was obvious that the 0-60 fathom zone was not fished as often as the deeper waters, and that when it was fished it produced poorer catches than the other depth zones within the same division. Despite the selectivity of fishing mentioned before, this indicates a lesser abundance of redfish in that zone. The effort in that zone may have been directed away from redfish concentrations because of preference for other species.

There was a slight indication in the data from 1962 that the catch-per-unit-of-effort was relatively lower in the 201-250 fathom depth zone, but this was not the case in 1963. Somewhat more effort was expended in this zone than in the shallowest zone, but still much less than in the middle three zones. McCann (1963) mentioned that there might be decreased gear efficiency in the very deep waters, e. g., fewer tows per day because of longer haul time.

Between the depth zones, 51-100; 101-150; and 151-200 fathoms there appeared to be little consistency in the differences in catch-per-day.

The catch-per-day is portrayed graphically in Figure 1.

The information gathered to date suggests that in deriving catch-per-unit-effort indices for redfish, the shallow depths may best be eliminated from consideration in order to sort out effort directed primarily to other species of fish. Beyond this, consideration of depth probably has very little value, at least for present United States fishery practices.

#### LITERATURE CITED

McCann, James A.

1963. United States report on redfish landings and effort by depth zones for 1962. ICNAF Doc. 58, 4 p. mimeo.

Table 1. -- 1963 redfish landings and effort by depth zone (metric tons, round, fresh).

Depth zone (fms.)	Effort Landings	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
<u>Division 3 L</u>														
151-200	Days fished				1.5									1.5
	tons				9									9
Total	Days fished				1.5									1.5
	tons				9									9
<u>Division 3 N</u>														
101-150	Days fished	14.1	24.5	7.5	14.5	4.0	15.2	3.5	9.5	2.5	25.5	22.6	10.0	153.4
	tons	351	468	196	232	19	304	155	240	47	813	689	235	3749
151-200	Days fished	6.5	26.0	--	29.0	6.0	--	20.8	24.0	5.0	18.5	113.8	21.0	170.6
	tons	184	534	--	527	96	--	605	674	67	538	355	495	4075
201-250	Days fished	--	--	4.0	--	--	--	2.3	--	--	--	--	2.0	8.3
	tons	--	--	255	--	--	--	62	--	--	--	--	18	335
Total	Days fished	20.6	50.5	11.5	43.5	10.0	15.2	26.6	33.5	7.5	44.0	36.4	33.0	332.3
	tons	535	1002	451	759	115	304	822	914	114	1351	1044	748	8159
<u>Division 3 O</u>														
61-100	Days fished	--	--	--	--	3.5	0.5	--	--	--	--	--	--	4.0
	tons	--	--	--	--	68	9	--	--	--	--	--	--	77
101-150	Days fished	5.5	--	--	--	9.5	--	--	--	9.2	--	--	--	24.2
	tons	95	--	--	--	182	--	--	--	159	--	--	--	436
151-200	Days fished	--	2.0	--	3.5	10.5	5.5	10.2	17.4	17.6	11.5	--	5.2	83.4
	tons	--	14	--	58	187	154	206	214	445	171	--	87	1536

Table 1. (ont.)

Depth zone (fms.)	Effort Landings	Month												Total
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
<u>Division 3 O</u>														
201-250	Days fished tons	--	--	--	--	--	15.0	--	3.2	20.1	0.5	--	0.3	39.1
Total	Days fished tons	5.5	2.0	--	3.5	23.5	21.0	10.2	20.6	46.9	12.0	--	5.5	150.7
<u>Division 3 P</u>														
101-150	Days fished tons	--	--	--	--	--	--	--	--	0.6	--	--	--	0.6
151-200	Days fished tons	--	--	--	--	--	--	27.0	5.0	--	--	--	--	32.0
201-250	Days fished tons	--	--	--	0.5	--	--	1.1	5.0	--	--	--	--	6.6
Total	Days fished tons	--	--	--	0.5	--	--	28.1	10.0	0.6	--	--	--	39.2
<u>Division 4 R</u>														
101-150	Days fished tons	--	--	--	--	--	--	1.5	10.5	10.0	47.9	65.7	27.5	163.1
151-200	Days fished tons	--	--	--	--	--	--	11	178	236	762	988	485	2660
Total	Days fished tons	--	--	--	--	--	--	1.5	10.5	10.0	60.9	67.7	35.0	185.6
<u>Division 4 R</u>														
101-150	Days fished tons	--	--	--	--	--	--	11	178	236	1044	1029	663	3161
151-200	Days fished tons	--	--	--	--	--	--	--	--	--	282	41	178	501
Total	Days fished tons	--	--	--	--	--	--	11	178	236	1044	1029	663	3161

Table 1.--(Cont.)

Depth zone (fms.)	Effort Landings	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
<u>Division 4 S</u>														
61-100	Days fished	--	--	--	--	--	--	--	--	3.0	--	--	--	3.0
	tons	--	--	--	--	--	--	--	--	55	--	--	--	55
101-150	Days fished	--	--	--	--	--	--	1.5	32.7	13.2	17.2	1.5	7.0	73.1
	tons	--	--	--	--	--	--	83	680	293	249	37	115	1457
Total	Days fished	--	--	--	--	--	--	1.5	32.7	16.2	17.2	1.5	7.0	76.1
	tons	--	--	--	--	--	--	83	680	348	249	37	115	1512
<u>Division 4 T</u>														
101-150	Days fished	--	--	--	--	--	--	1.2	--	--	1.5	--	--	2.7
	tons	--	--	--	--	--	--	51	--	--	11	--	--	62
151-200	Days fished	--	--	--	--	--	--	--	7.2	--	--	--	--	7.2
	tons	--	--	--	--	--	--	--	142	--	--	--	--	142
Total	Days fished	--	--	--	--	--	--	1.2	7.2	--	1.5	--	--	9.9
	tons	--	--	--	--	--	--	51	142	--	11	--	--	204
<u>Division 4 V</u>														
61-100	Days fished	3.0	--	--	4.1	10.9	31.5	32.4	12.8	0.2	1.4	9.2	0.3	105.8
	tons	89	--	--	45	187	667	521	240	2	18	230	8	2007
101-150	Days fished	0.5	0.5	--	0.5	11.4	11.7	48.7	10.2	10.4	2.8	1.1	2.0	99.8
	tons	3	8	--	10	267	261	788	199	100	27	21	63	1747
151-200	Days fished	--	--	--	1.0	4.1	28.5	13.8	47.3	9.5	5.0	4.5	5.8	119.5
	tons	--	--	--	10	80	700	214	896	91	104	81	104	2280

Table 1.--(Cont.).

Depth zone (fms.)	Effort Landings	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
<u>Division 4 V</u>														
201-250	Days fished tons	--	--	--	1.5	8.5	4.0	--	0.5	--	1.0	--	--	15.5
Total	Days fished tons	3.5	0.5	--	7.1	34.9	75.7	94.9	70.8	20.1	10.2	14.8	8.1	340.6
<u>Division 4 W</u>														
0-60	Days fished tons	--	--	--	3.7	--	--	--	--	--	--	--	--	3.7
61-100	Days fished tons	21.0	27.4	37.4	74.2	82.4	50.7	29.5	21.5	16.5	5.6	12.6	7.2	386.0
101-150	Days fished tons	--	--	10.0	9.4	3.2	1.3	5.2	0.6	1.3	8.2	--	4.5	43.7
151-200	Days fished tons	--	--	8.9	--	0.5	--	0.4	4.9	3.2	--	--	--	17.9
Total	Days fished tons	21.0	27.4	56.3	87.3	86.1	52.0	35.1	27.0	21.0	13.8	12.6	11.7	451.3
<u>Division 4 X</u>														
0-60	Days fished tons	10.8	--	--	0.5	--	0.9	89.6	52.1	10.2	5.5	18.0	--	187.6
61-100	Days fished tons	1	--	--	6	--	12	1037	1	2	1	1	--	1061
Total	Days fished tons	46.9	23.5	27.0	35.7	79.6	116.9	57.5	73.4	160.5	130.5	13.3	15.4	780.2
	Days fished tons	410	468	537	381	1055	1416	509	562	419	202	24	127	6110

Table 1. --(Cont.)

Depth zone (fms.)	Effort		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	Days fished	Landings tons													
101-150	- -	- -	- -	1.0	0.5	- -	32.1	35.2	- -	73.2	46.3	14.5	22.0	4.2	229.0
	- -	- -	- -	17	2	- -	440	417	- -	736	311	10	8	2	1943
Total	57.7	411	24.5	27.5	36.2	111.7	153.0	147.1	147.1	198.7	217.0	150.5	53.3	19.6	1196.8
	411	485	485	539	387	1495	1845	1546	1546	1299	732	213	33	129	9114
<u>Division 4 X</u>															
0-60	26.5	77	6.9	12.0	9.1	17.2	11.5	30.5	30.5	25.6	17.2	22.9	30.7	41.1	251.2
	77	3	3	10	11	20	55	46	46	74	47	24	14	35	406
61-100	67.7	425	83.6	117.2	76.7	103.1	101.9	90.7	90.7	71.2	115.3	123.6	146.0	70.6	1167.6
	425	261	261	555	269	1150	790	694	694	393	390	310	143	225	5605
101-150	- -	- -	2.5	2.9	- -	17.6	25.3	13.9	13.9	7.6	6.6	16.6	136.0	3.7	232.7
	- -	- -	12	34	- -	243	241	133	133	58	9	3	24	19	776
Total	94.2	502	93.0	132.1	85.8	137.9	138.7	135.1	135.1	104.4	139.1	163.1	312.7	115.4	1651.5
	502	276	276	599	280	1413	1076	873	873	525	446	337	181	279	6787
<u>Division 5 Y</u>															
0-60	34.4	3	70.3	4.3	54.0	50.0	126.5	109.1	109.1	263.4	325.1	197.7	79.1	157.4	1471.3
	3	1	1	1	1	10	9	4	4	34	8	21	4	23	119
61-100	400.2	191	376.4	339.8	115.5	101.4	33.6	88.8	88.8	51.9	53.4	159.5	100.0	127.9	1948.4
	191	83	83	57	60	352	304	153	153	177	61	51	18	36	1543
101-150	104.1	28	- -	45.6	10.5	36.3	2.5	13.8	13.8	112.7	104.0	184.2	167.8	80.2	861.7
	28	- -	- -	7	13	271	22	2	2	21	22	13	12	15	426
Total	538.7	222	446.7	389.7	180.0	187.7	162.6	211.7	211.7	428.0	482.5	541.4	346.9	365.5	4281.4
	222	84	84	65	74	633	335	159	159	232	91	85	34	74	2088

Table 2. Redfish catch/day in metric tons (underlined estimates are based on less than 20 days fishing).

Depth zone (fms.)	DIVISION										
	5Z	5Y	3N	3O	3P	4R	4S	4T	4V	4W	4X
	1963										
0-60	0.1	1.6	---	---	---	---	---	---	---	<u>11.1</u>	5.6
61-100	0.8	4.8	---	<u>19.2</u>	---	---	<u>18.3</u>	---	19.0	17.4	7.8
101-150	0.5	3.3	24.4	18.0	<u>10.0</u>	16.3	19.9	<u>23.0</u>	17.5	15.8	8.5
151-200	---	---	23.9	18.4	29.5	22.3	---	<u>19.7</u>	19.1	11.9	---
201-250	---	---	<u>40.4</u>	21.3	<u>14.8</u>	---	---	---	29.1	---	---
Total	0.5	4.1	24.6	19.1	26.7	17.0	19.9	<u>20.6</u>	19.0	17.0	7.
	1962										
0-60	0.1	1.4	---	---	---	---	---	---	---	<u>13.0</u>	10.2
61-100	1.1	6.4	<u>45.6</u>	<u>25.4</u>	---	---	---	---	19.0	19.7	12.7
101-150	0.7	9.9	28.8	26.2	---	<u>13.5</u>	---	---	20.2	25.3	11.9
151-200	<u>2.3</u>	<u>7.5</u>	30.1	26.4	<u>18.7</u>	---	---	<u>8.3</u>	<u>17.7</u>	<u>26.7</u>	<u>13.5</u>
201-250	---	<u>7.0</u>	<u>24.3</u>	16.6	<u>17.4</u>	---	---	---	<u>13.4</u>	<u>20.0</u>	---
Total	0.7	5.3	29.5	24.8	<u>18.1</u>	<u>13.5</u>	---	<u>8.3</u>	19.4	20.9	11.9



Table 3. Rankings of redfish catch/day

Depth zone (fms.)	DIVISION										
	3N	3O	3P	4R	4S	4T	4V	4W	4X	5Y	5Z
1962											
0-60	-	-	-	-	-	-	-	5	4	5	3
61-100	3	3	-	-	-	-	2	4	2	4	2
101-150	1	2	-	1	-	-	1	2	1	1	1
151-200	2	1	1	-	-	1	3	1	3	2	-
201-250	4	4	2	-	-	-	4	3	-	3	-
1963											
0-60	-	-	-	-	-	-	-	4	3	3	3
61-100	-	2	-	-	2	-	3	1	2	1	1
101-150	3	4	3	2	1	1	4	2	1	2	2
151-200	2	3	1	1	-	2	2	3	-	-	-
201-250	1	1	2	-	-	-	1	-	-	-	-

Table 4. Average values of rankings of catch per day.

Depth zone (fms.)	1962			1963			Total		
	Sum	Number	Av. Rank	Sum	Number	Av. Rank	Sum	Number	Av. Rank
0-60	17	4	4.25	13	4	3.25	30	8	3.75
61-100	20	7	2.86	10	7	1.43	30	14	2.14
101-150	10	8	1.25	25	11	2.27	35	19	1.84
151-200	14	8	1.50	14	7	2.00	28	15	1.87
201-250	20	6	3.33	5	4	1.25	25	10	2.50

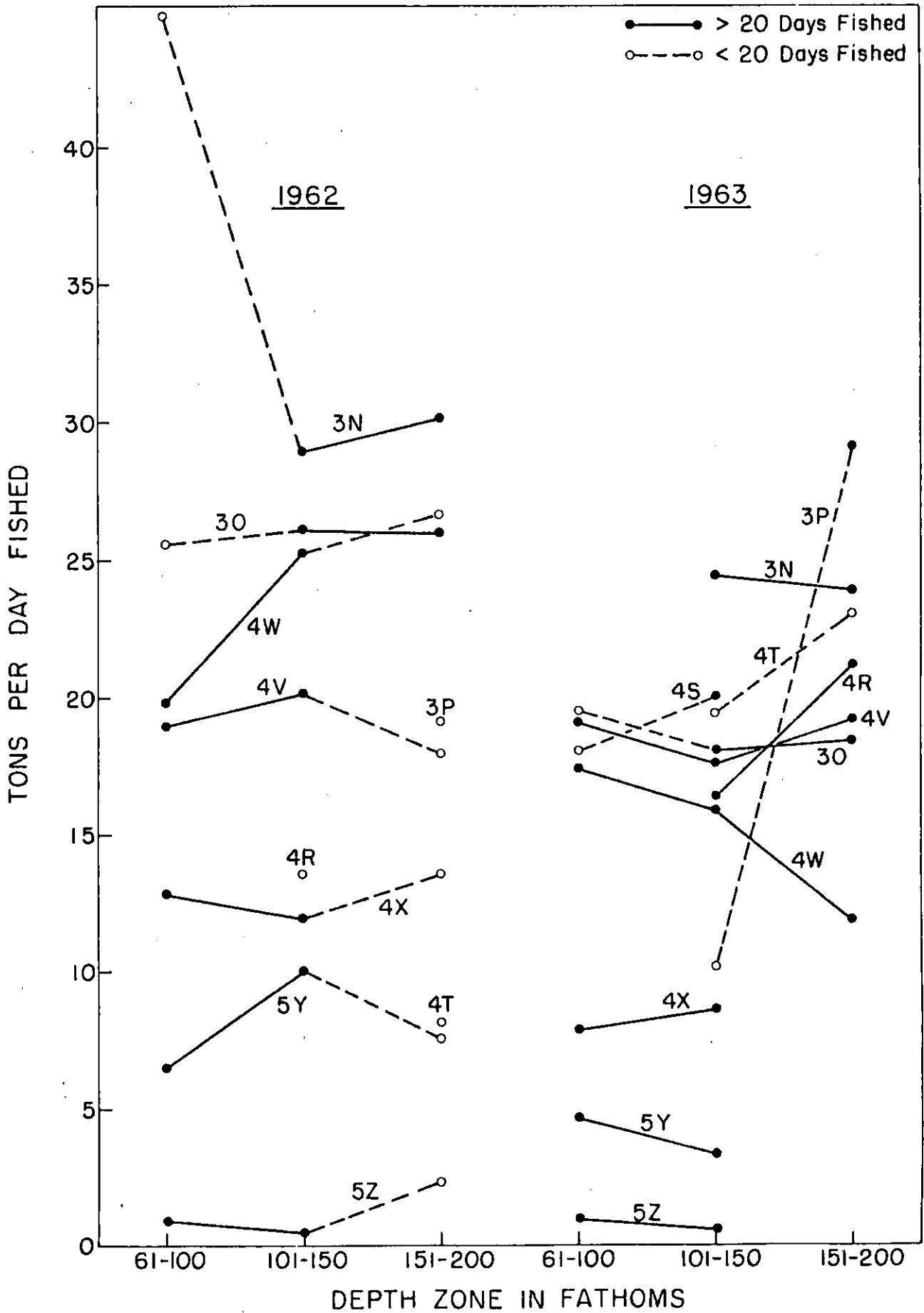


Figure 1. --Catch per day of redfish by area and depth zones for 1962 and 1963