



DEPARTMENT OF NATIONAL PARKS AND WILDLIFE MANAGEMENT

**1993 FISHERIES STATISTICS
LAKE KARIBA - ZIMBABWE SHORE**

Lake Kariba Fisheries Research Institute
Kariba

PROJECT REPORT NO. 77

by:
R. A. SANYANGA & L. D. MUCHABAIWA
AUGUST 1994

LANDINGS SUMMARY

1. The Pelagic fishery (Kapenta)

Lake Basin	Catch in Tonnes	
	1992	1993
Kariba	10371	10690
Bumi/Chalala	4630	5333
Sengwa	2280	2139
Binga & Mlibizi	1660	1794
Total	18941	19958

2. The Inshore Fishery

Area	Catch in Tonnes	
	1992	1993
C1	63	51.85
C2	87	124.90
C3	33	20.74
C4	140	159
C5	141	96.9
C6		29.5
C7	19	12.6
Total Enumerated	483	495.49
Total estimate	877.09	1280.85

Grand total for Zimbabwean 19958 (kapenta) +1280.85 (inshore) +10.3 (Tigerfish by-catch) = **21 249.15 tonnes**

CONTENTS

PART I : The Pelagic (Kapenta) Fishery

Introduction	1
Figure 1 : Location of Kapenta Fishing Bases on Lake Kariba.	2
Figure 2a : Percentage of total Kapenta landings for each basin, 1993	3
Figure 2b : Percentage of total number of rigs per basin, 1993	3
Figure 3 : Trends in the Kapenta fishery, 1974-93 (CPUE; Catch; Effort)	4
Table 1 : Landings (tonnes) of Kapenta, 1974 -1993	5
Figure 4 : Trends in the Kapenta fishery by basin, 1979 to 1993	6
Table 2 : Total effort (unit night) in the Kapenta fishery, 1974 - 1993	7
Table 3 : Monthly Kapenta catches (tonnes), 1993	7
Figure 5 : Monthly trends in Kapenta catches, 1993	8
Table 4 : Average Catch per Unit Effort (tonnes/rig/night) of Kapenta, 1974-1993.	9
Table 5 : Monthly fishing effort (rig night) for Kapenta, 1993	9
Table 6 : Monthly Tigerfish by-catch in kgs (from Kapenta rigs), 1993	10
Figure 6 : Monthly trends in catches for Tigerfish by-catch, 1993	11
Table 7 : By-catch (tonnes) Tigerfish, 1974-1993	12

PART II : The Inshore Fishery

Sampling in the Inshore Fishery	14
Figure 7 : Location of Artisanal Fishing villages on Lake Kariba	15
Table 8 : Illustration of estimation of data in enumerated villages in the Inshore Fishery	16
Figure 8 : Percentage of Total Inshore catch by Area, 1993	17

Table 9 : Catch and Effort Summary for enumerated villages, 1993	18
Table 10 : Estimated Catch Composition for 1993 Based on Enumerated Villages . .	18
Figure 9 : Catch proportions of different species caught in the Inshore area.	19
Figure 10 : Species composition of inshore landings (% kg) by Area	20
Table 11 : Catch and Effort for areas c1-c7 Fishery, 1983 to 1993	21
Table 12 : Catch and Effort for Gache Gache Co-operative Society, 1985 to 1993 . .	21
Table 13 : Catch and Effort for Nyaodza Co-operative Society, 1987 to 1993	22
Table 14 : Catch and Effort for Area C1, 1973 to 1993	22
Table 15 : Catch and Effort for Area C2, 1970 to 1993	23
Table 16 : Catch and Effort for Area C3, 1973 to 1993	24
Table 17 : Catch and Effort for Area C4, 1970 to 1993	25
Table 18 : Catch and Effort for Area C5, 1973 to 1993	26
Table 19: Catch and Effort for Area C6 and C7, 1989 to 1993	26
APPENDIX 1	27
Kapenta return form	27
APPENDIX 2	29
Summary of Inshore Fishing Gear	29
APPENDIX 3	31
Location of Fishing Villages	31

PART I

The Pelagic (Kapenta) Fishery

Introduction

This statistical report covers Kapenta catch records from the Zimbabwean part of the lake. Data is compiled from returns which the Kapenta fishing companies submit to L.K.F.R.I every month. An example of the forms used by the companies to record the catches is in Appendix 1. Tigerfish landings are not accurate. The fishermen rarely submit all their tigerfish to their employers but the landings give a general trend.

Kapenta usually constitute about 90% of the total catch from Lake Kariba. However, within the last few years there has been a substantial increase in the incidence of theft and illegal sales from rigs. The scale of such illegal activities is difficult to quantify but we estimate that at least 20% and maybe as much as 50% of the total Kapenta catch is not recorded. The figures of the Kapenta landings presented in the report must therefore be reviewed as a considerable underestimation of the total catch.

Kapenta fishing operations are based at 11 sites (Figure 1). In 1993, 354 rigs owned by 67 companies were in operation. For statistical purposes, catches are recorded for the 5 hydrological basins namely Mlibizi, Binga, Sengwa, Bumi and Kariba (also known as Sanyati basin); except that the catches from the Mlibizi and Binga basins are combined as the operators in these regions share common fishing grounds. Bumi and Chalala also use the same basin for fishing.

Operators are restricted to fishing in waters greater than 20m in depth and 5 km from hotels. The region known as Leisure bay at Kariba is also closed to Kapenta fishing.

Figure 1 : Location of Kapenta Fishing Bases on Lake Kariba.

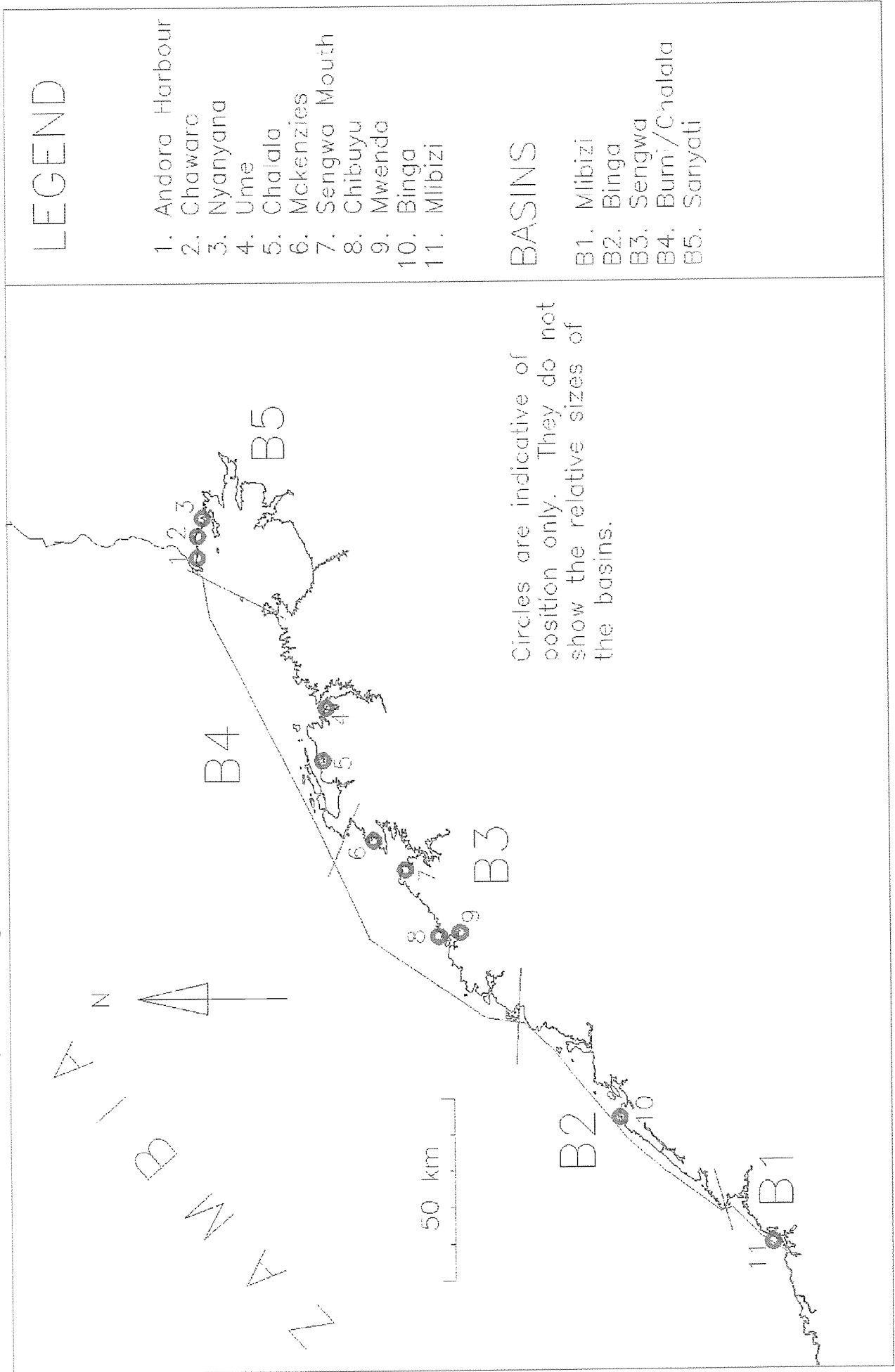


Figure 2a : Percentage of total Kapenta landings for each basin, 1993

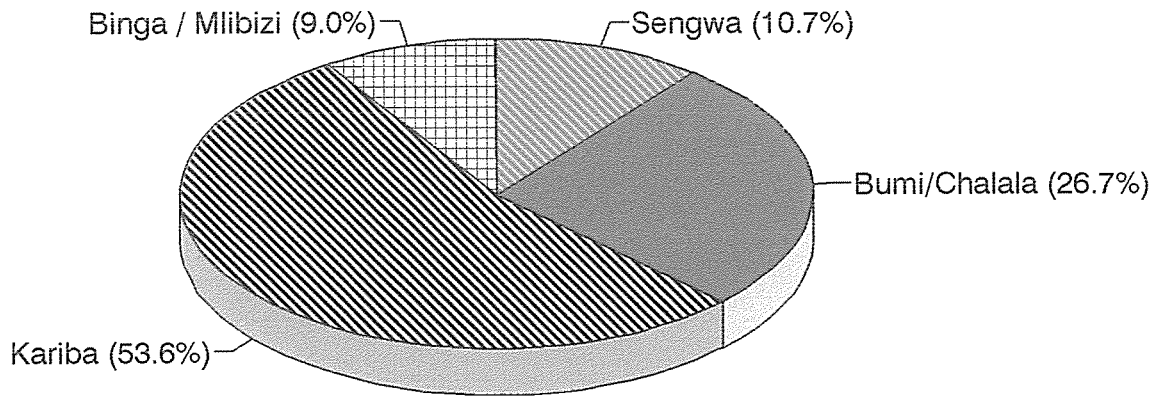
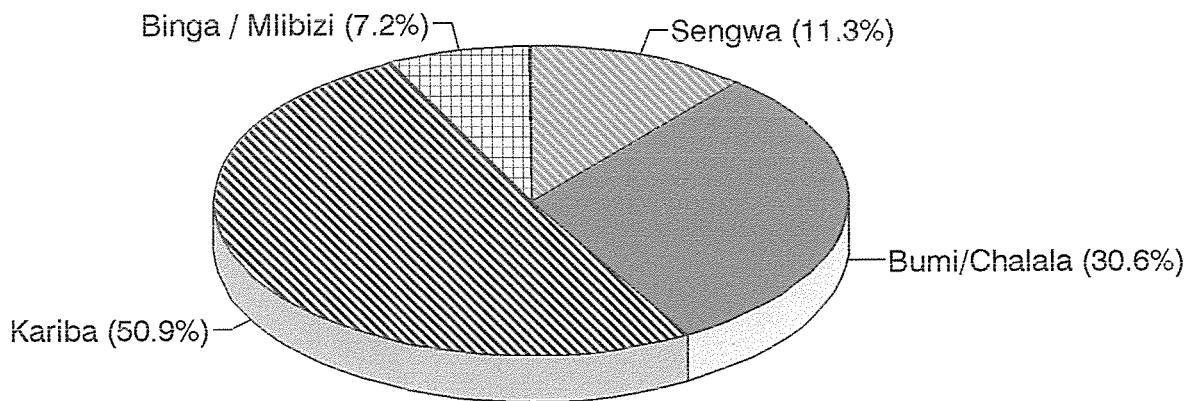
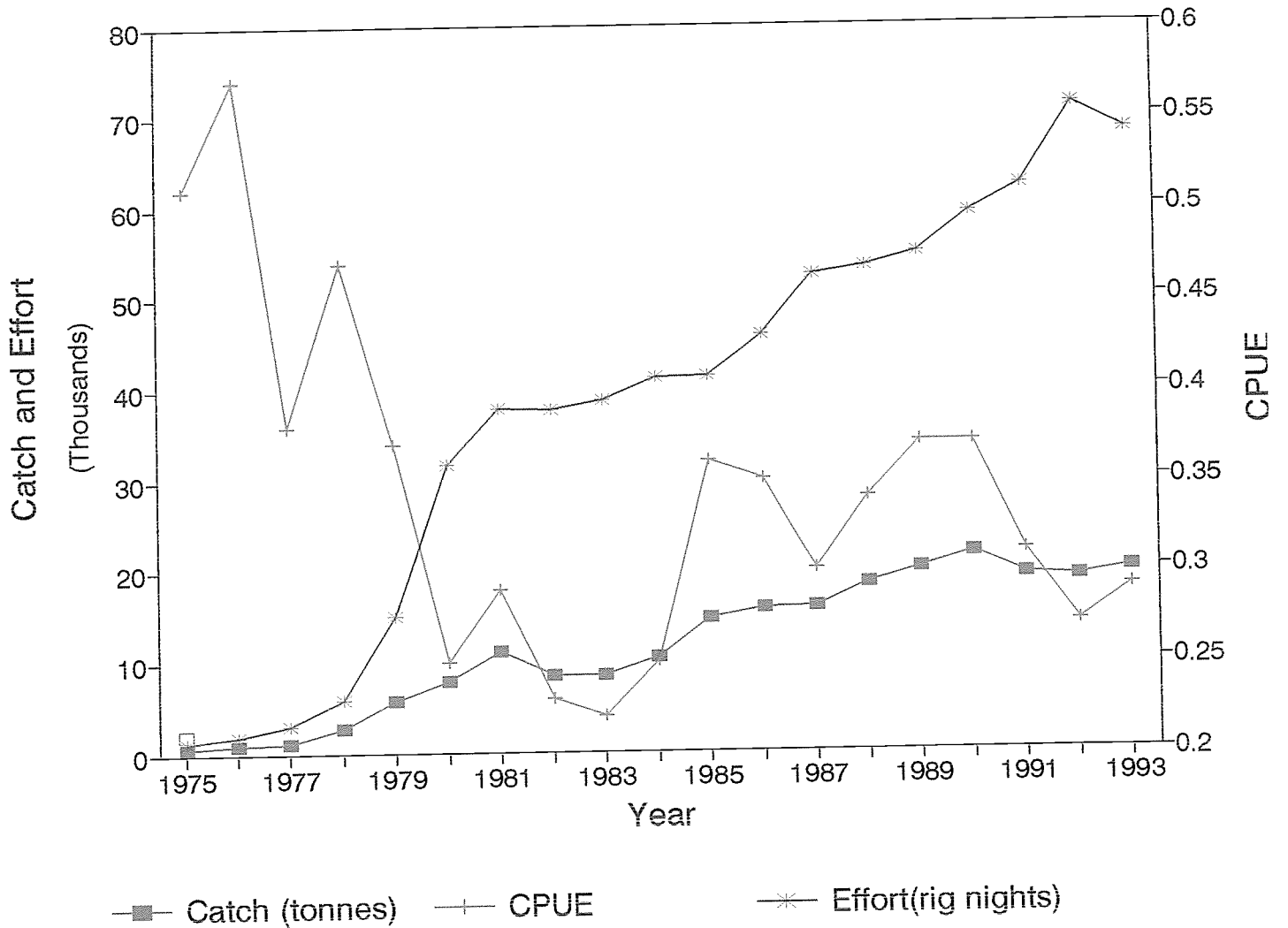


Figure 2b : Percentage of total number of rigs per basin, 1993



The proportion of the catch to rig is almost 1 to 1 as seen from the two figures above.

Figure 3 : Trends in the Kapenta fishery, 1974-93 (CPUE; Catch; Effort)

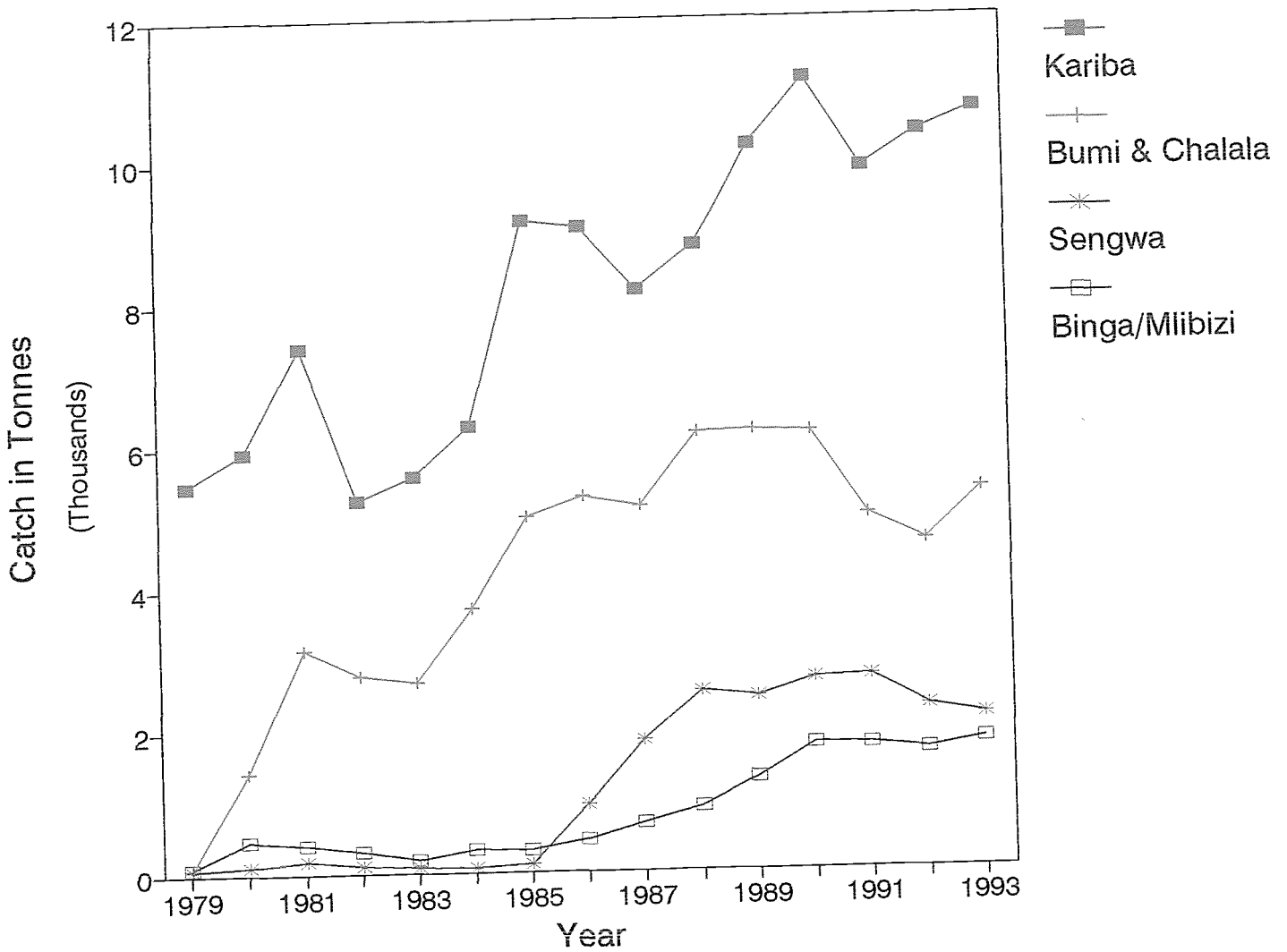


There is a slight reduction in effort from 1992 thus resulting in an increase in CPUE.. The reduction in effort may be due to redistribution and some of the new companies having failed to start operations at the beginning of the year 1993. The true CPUE may be slightly distorted due to thefts as explained before.

Table 1 : Landings (tonnes) of Kapenta, 1974 -1993

YEAR	AREA					TOTAL
	KARIBA	BUMI	CHALALA	SENGWA	BINGA / MLIBIZI	
1974	488					488
1975	656					656
1976	1050					1050
1977	1172					1172
1978	2770			35		2805
1979	5475	78	8	75	96	5732
1980	5938	173	1261	115	465	7952
1981	7408	285	2879	175	390	11137
1982	5249	234	2544	113	310	8450
1983	5590	170	2516	96	176	8548
1984	6286	305	3417	74	312	10394
1985	9179	338	4658	105	306	14586
1986	9077	369	4912	944	445	15747
1987	8194	288	4847	1832	662	15823
1988	8799	186	5975	2513	893	18366
1989	10199	146	6036	2438	1293	20112
1990	11143	194	5977	2692	1752	21758
1991	9867	92	4893	2714	1740	19306
1992	10371	4620		2279	1660	18937
1993	10690	5330		2139	1794	19958

Figure 4 : Trends in the Kapenta fishery by basin, 1979 to 1993



The trends in all basins are reasonably similar. Kariba basin appears to have influence over the overall catch. As compared to 1992 the catches for all basins are increasing except for those of Sengwa.

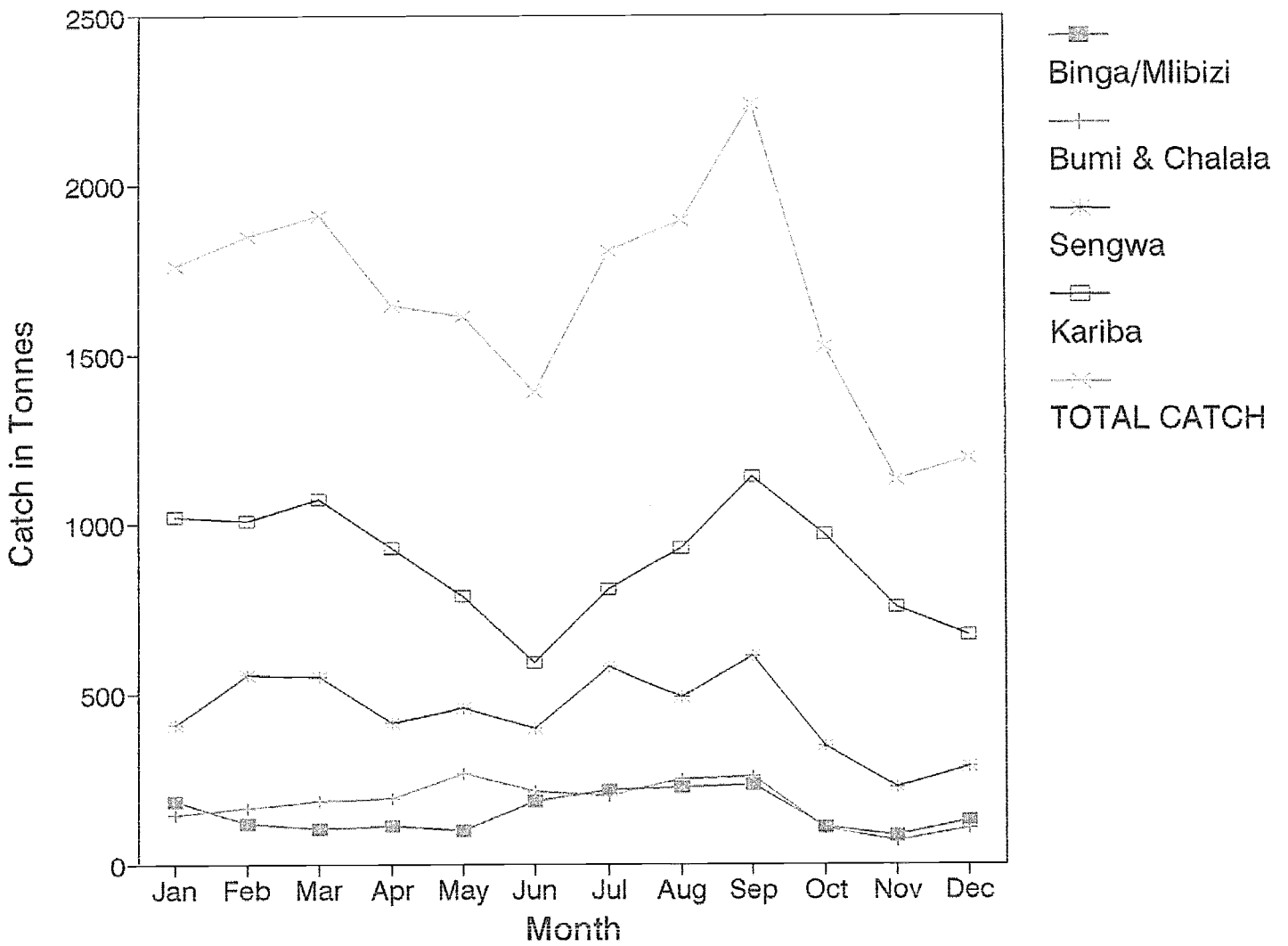
Table 2 : Total effort (unit night) in the Kapenta fishery, 1974 - 1993

YEAR	AREA					TOTAL
	KARIBA	BUMI	CHALALA	SENGWA	BINGA / MLIBIZI	
1974	616					616
1975	1298					1298
1976	1833					1833
1977	3114					3114
1978	5877			96		5973
1979	14003	195	43	324	543	15108
1980	22775	789	6046	586	1551	31747
1981	24393	1770	9953	668	1188	37972
1982	23816	1467	10560	539	1394	37776
1983	24481	1036	11643	642	1063	38865
1984	25112	1077	13253	499	1293	41234
1985	24245	1155	14319	449	1235	41403
1986	26153	1245	15140	1688	1564	45790
1987	29702	1410	15966	3544	1792	52414
1988	29501	1002	16120	4356	2424	53403
1989	28670	887	16716	4957	3689	54919
1990	31160	952	16854	5396	4831	59193
1991	33133	666	17255	6314	4840	62208
1992	37544	20053		7359	6109	71066
1993	37533	18883		5880	5859	68155

Table 3 : Monthly Kapenta catches (tonnes), 1993

MONTH	BASIN				TOTAL
	BINGA / MLIBIZI	SENGWA	BUMI & CHALALA	KARIBA	
January	185	143	410	1022	1760
February	118	163	558	1010	1848
March	103	183	552	1075	1912
April	110	192	414	928	1644
May	100	266	461	787	1613
June	185	211	400	593	1389
July	216	202	579	808	1803
August	226	247	492	930	1896
September	233	255	611	1140	2239
October	107	105	344	969	1525
November	83	68	226	754	1133
December	129	104	286	675	1194
TOTAL	1795	2139	5333	10691	19958

Figure 5 : Monthly trends in Kapenta catches, 1993



There is bimodality in the annual catches. This pattern is consistent over the years. The peaks occur in March and September. These are due to nutrient inflow and lake turnover, respectively. The peaks are not pronounced in Binga / Mlibizi and Sengwa basins because during the early months of the year catches are low because of turbidity.

Table 4 : Average Catch per Unit Effort (tonnes/rig/night) of Kapenta, 1974-1993.

YEAR	AREA					TOTAL
	KARIBA	BUMI	CHALALA	SENGWA	BINGA/ MLIBIZI	
1974	0.78					0.78
1975	0.51					0.51
1976	0.57					0.57
1977	0.38					0.38
1978	0.47				0.36	0.47
1979	0.34	0.40	0.19	0.26	0.18	0.37
1980	0.26	0.22	0.21	0.20	0.31	0.25
1981	0.30	0.17	0.29	0.26	0.23	0.29
1982	0.22	0.16	0.25	0.21	0.24	0.23
1983	0.23	0.16	0.22	0.18	0.17	0.22
1984	0.25	0.28	0.26	0.17	0.24	0.25
1985	0.40	0.36	0.30	0.23	0.27	0.36
1986	0.35	0.26	0.36	0.53	0.30	0.35
1987	0.26	0.15	0.30	0.50	0.36	0.30
1988	0.29	0.19	0.37	0.58	0.37	0.34
1989	0.36	0.16	0.36	0.49	0.35	0.37
1990	0.36	0.20	0.35	0.50	0.36	0.37
1991	0.29	0.13	0.28	0.43	0.35	0.31
1992	0.27		0.23	0.30	0.27	0.27
1993	0.28		0.28	0.36	0.30	0.29

The CPUE values consistently show that since 1986 Sengwa has the highest catch.

Table 5 : Monthly fishing effort (rig night) for Kapenta, 1993

MONTH	BASIN				TOTAL
	BINGA / MLIBIZI	SENGWA	BUMI & CHALALA	KARIBA	
January	468	425	1153	2925	4971
February	460	526	1493	2956	5435
March	484	463	1697	3177	5821
April	492	439	1451	2965	5347
May	464	606	1725	3224	6019
June	587	474	1694	3159	5914
July	554	445	1753	3036	5788
August	514	600	1636	3271	6021
September	479	611	1723	3300	6113
October	466	500	1618	3230	5814
November	516	393	1616	3194	5719
December	375	398	1324	3096	5193
TOTAL	5859	5880	18883	37533	68155

Table 6 : Monthly Tigerfish by-catch in kgs (from Kapenta rigs), 1993

MONTH	BASIN				TOTAL
	BINGA / MLIBIZI	SENGWA	BUMI & CHALALA	KARIBA	
January	99	155	20	303	577
February	68	77	34	286	465
March	123	87	31	341	582
April	456	35	250	242	983
May	634	100	25	224	983
June	138	94	253	167	652
July	147	155	52	145	499
August	113	241	44	100	498
September	227	214	90	210	741
October	288	83	47	334	752
November	388	24	201	835	1448
December	292	115	102	1575	2084
TOTAL	2973	1380	1148	4762	10263

Figure 6 : Monthly trends in catches for Tigerfish by-catch, 1993.

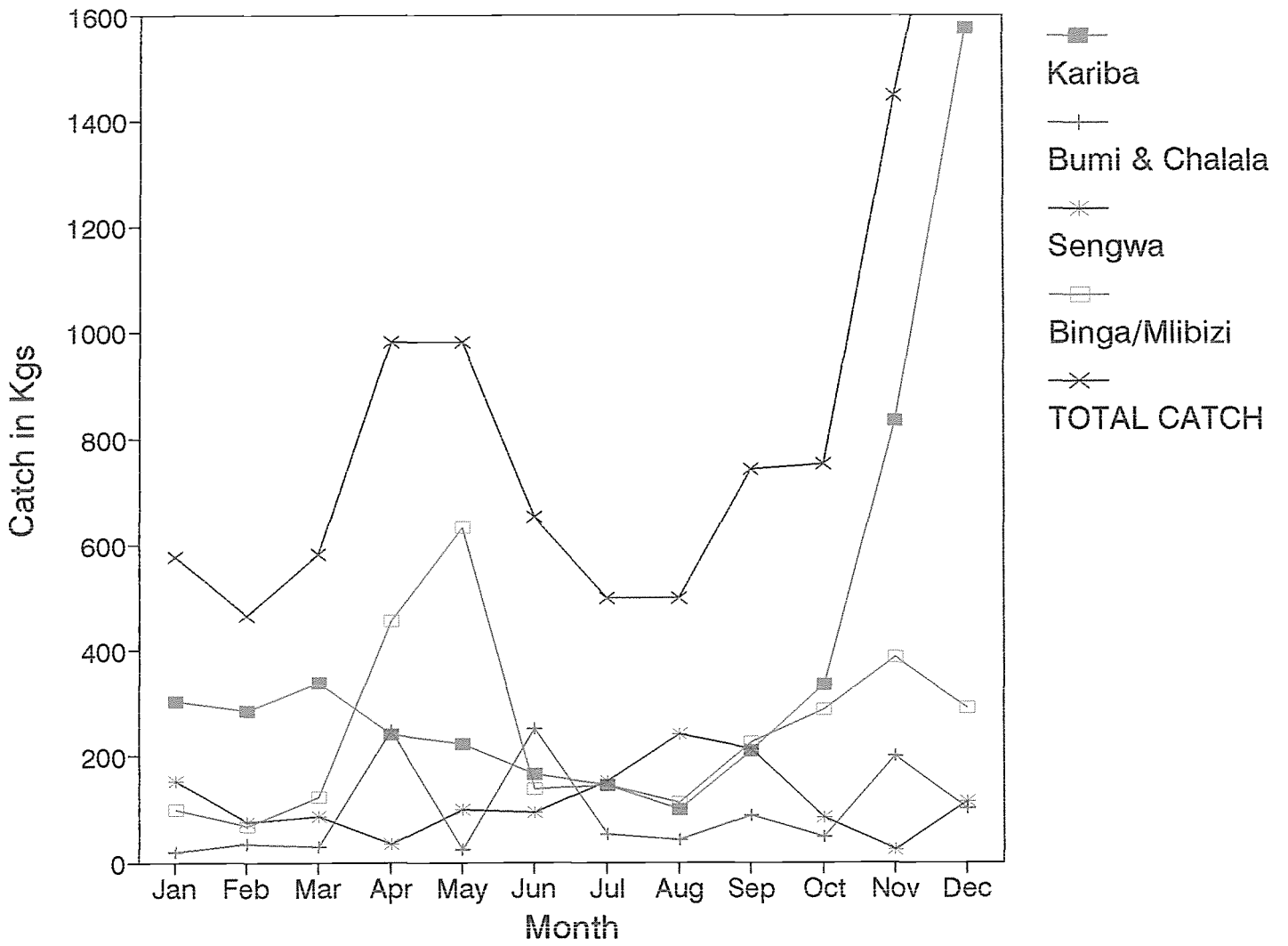


Table 7 : By-catch (tonnes) Tigerfish, 1974-1993.

YEAR	AREA					TOTAL
	KARIBA	BUMI	CHALALA	SENGWA	BINGA/ MLJIBIZI	
1974	18					18
1975	81					81
1976	91					91
1977	138					138
1978	129			1		130
1979	64	1		3	2	70
1980	41	1		2	5	49
1981	54	6	2	1	2	65
1982	44	3	1	1	1	50
1983	45	4	3	1	1	54
1984	22	2	2	-	1	27
1985	22	1	2	1	-	26
1986	40	2	19	3	3	67
1987	31	2	6	3	2	44
1988	8	1	3	1	2	15
1989	11	0.5	4	1	3	19.5
1990	14	0.5	4	3	5	26.5
1991	8	0	2	1	1	12
1992	8	1.4	1.1	1.1	2.8	13.7
1993	4.8		1.2	1.3	3.0	10.3

The total catch for tigerfish in the whole fishery is

Pelagic	10.30 tonnes
Inshore	328.23 tonnes
Sport fishery	0.50 tonnes
Total	338.03 tonnes

PART II

The Inshore Fishery

Sampling in the Inshore Fishery

The sampling system in use has been designed to provide a statistically valid catch estimation of the whole of the Zimbabwe lake shore. It should be noted that whereas the Kapenta data represent total actual landed catches, the data from the artisanal fishery are from sampled catches, thus all figures presented for the artisanal fishery are estimates. The one exception is the data from Nyaodza, Gache Gache and Luyando co-operatives who submit returns for the whole year which reflect the actual total landings. The fishing areas are divided into 7 zones, C1 to C7 (Figure 7) thus all areas and all basins are represented (see Appendix 3). The fishing activities are simplified because there is only one type of gear used throughout the whole inshore fishery of Zimbabwe.

Whereas the Kapenta, which occupy the open, pelagic waters of the lake, represent a unit stock which is harvested by both Zimbabwe and Zambia; the artisanal fishery exploits inshore species which, in general, occupy water less than 10m deep along the shoreline. The Zambian and Zimbabwean inshore fisheries may therefore be considered to be exploiting two separate stocks. The inshore fishery of Zambia therefore has no influence upon the inshore fishery of Zimbabwe and vice versa.

As it is not possible to sample all villages nor the total landing for any particular village for the whole year, 10 representative villages are enumerated for 10 days every month. The sampled catch is raised to an estimate of the total catch per village by multiplying by the ratio between total number of days sampled and days in a year. To estimate the total catch for the Zimbabwe side of the lake, the ratio between the number of fishermen in the villages sampled and the total number of fishermen on the Zimbabwean side of the lake is used.

The above calculations make the assumption that fishing takes place on 360 days and that the catchability of the species is the same throughout the whole lake. It is also assumed that the number of active fishermen per village is approximately the same.

National Parks regulations state that each fishermen is allowed a maximum of 5 gill-nets with a minimum mesh of 100mm, and conformation to this regulation is assumed for catch effort calculations.

The main species caught in the inshore fishery are the breams *Oreochromis mortmeri*, *Serranochromis codringtoni*, *Tilapia rendalli*; the carp *Labeo altivelis*; the tigerfish *Hydrocynus vittatus*; the mormyrid *Mormyrus longirostris*; the barbel *Clarius gariepenus* and the squeaker *Synodontis zambezensis*.

Figure 7 : Location of Artisanal Fishing villages on Lake Kariba.

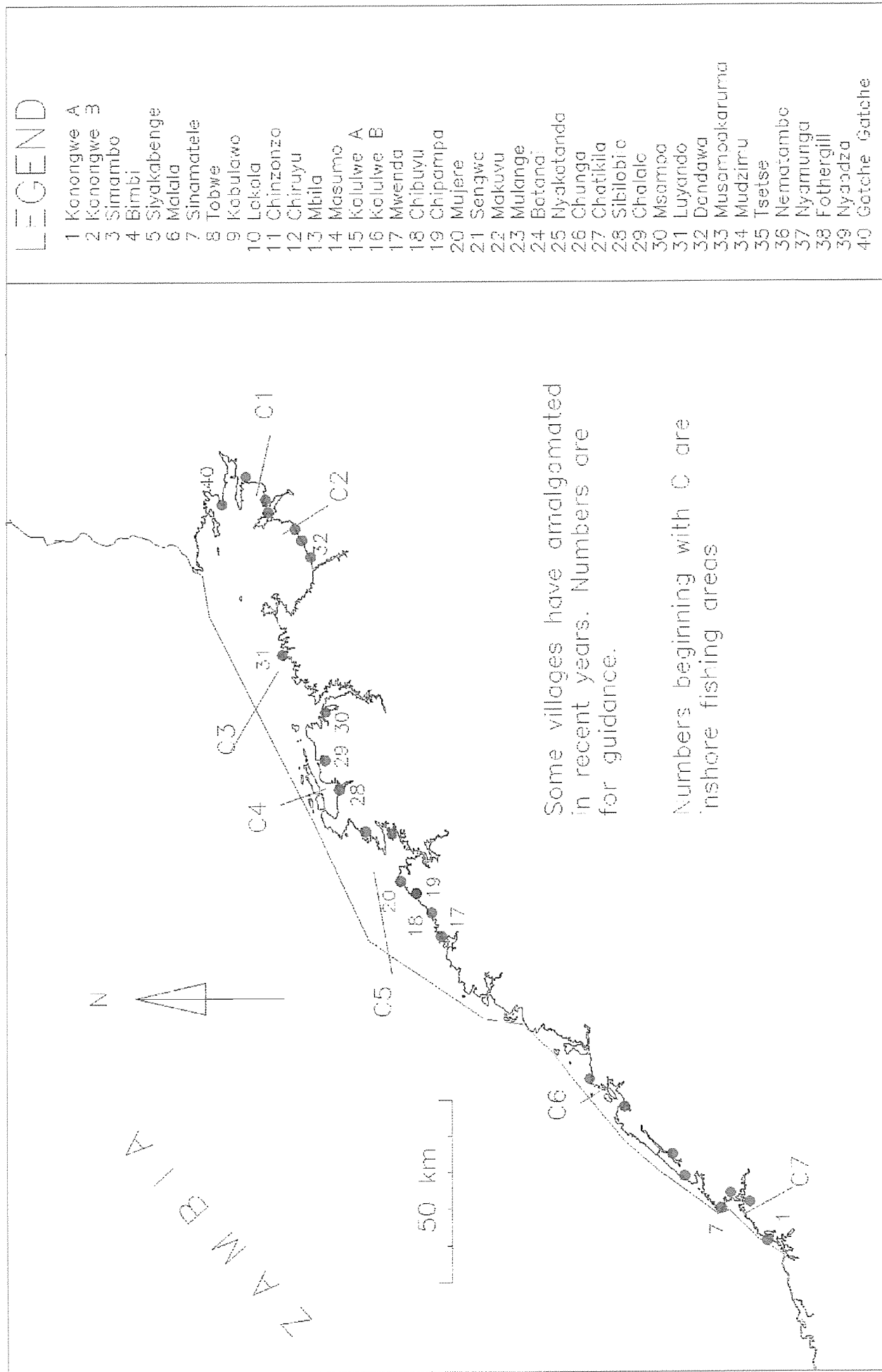


Table 8 : Illustration of estimation of data in enumerated villages in the Inshore Fishery

AREA	CAMP CODE	CAMP NAME	TOTAL SAMPLED CATCH in tonnes	TOTAL SAMPLED EFFORT (no of nets X 45.5m)	CPUE for sample (c/t)	TOTAL FISHERMEN (from Frame Survey 1993)	TOTAL SAMPLED DAYS	ESTIMATED TOTAL CATCH (C X 360) G	ESTIMATED TOTAL EFFORT (D X 360) G
A	B		C	D	E	F	G	H	I
C2	6	Nematombo	3.72	79 456	1.8	38	110	12.1	260 332
	7	Mudzimu	2.45	93 127	1.8	11	90	9.8	372 508
	10	Dandawa	31.49	344 696	4.7	79	110	103.0	112 809
C4	12	Musamba	32.51	196 645	3.5	68	110	117.0	605 061
	14	Sibilobilo	8.18	147 006	2.9	55	70	42.0	756 030
C5	19	Makuyu	9.97	105 356	2	31	110	35.8	344 801
	22	Mujere	16.82	162 572	1.7	58	99	61.1	591 170
	43	Kalulwe	6.57	157 855	1.8	38	80	29.5	710 034
C7	39	Simambo	3.16	60 901	1.5	22	90	12.6	243 604

The total estimate for co-op returns is 51.85 tonnes and enumerated villages is 422.9 tonnes. The total estimate for the whole lake is

$$422.9 \text{ t} \times \frac{\text{Total fishermen for the whole lake}}{\text{Number of fishermen in the above villages}} + (\text{coop catches})$$

$$422.9 \text{ t} \times \frac{1163}{400} + (51.85) = 1\,280.85 \text{ t}$$

Figure 8 : Percentage of Total Inshore catch by Area, 1993

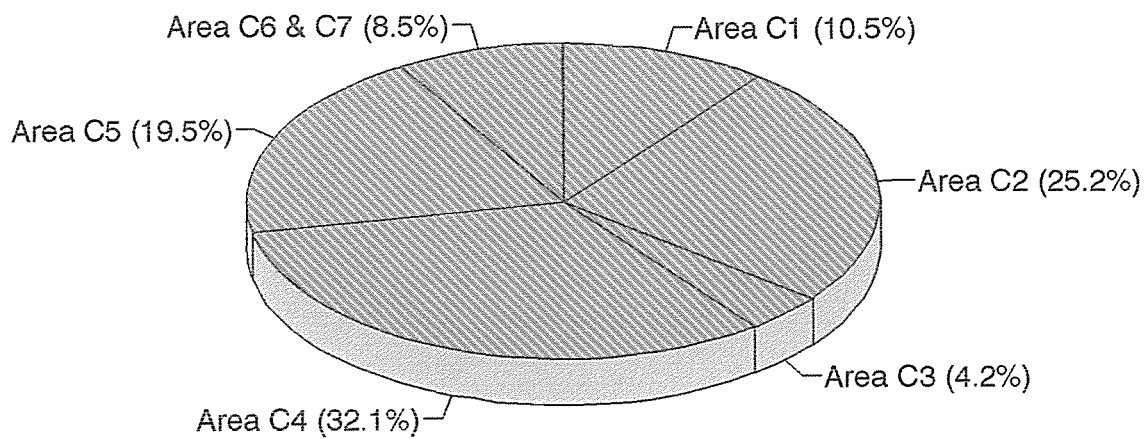


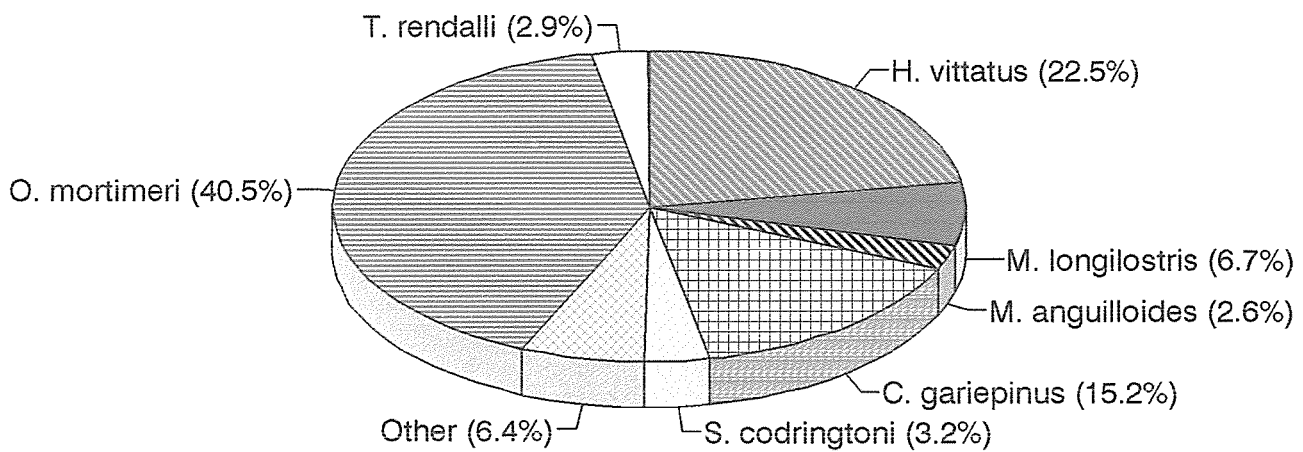
Table 9 : Catch and Effort Summary for enumerated villages, 1993

VILLAGE	EFFORT (M)	CATCH (TON)	CPUE (KG/100M)
GACHE GACHE	669 150	37.56	5.61
NYAODZA	609 820	14.29	2.34
NEMATOMBO	260332	12.1	4.65
MUDZIMU	372508	9.8	2.63
DANDAWA	1128096	103.0	9.13
MUSAMBA	643565	117.0	18.18
SIBILOBILO	756030	42.0	5.55
MAKUYU	344801	35.8	10.38
MUJERE	591171	61.1	10.34
KALULWE	710347	29.5	4.15
SIMAMBO	243604	12.6	5.17
TOTAL	6613582	474.75	71.78

Table 10 : Estimated Catch Composition for 1993 Based on Enumerated Villages

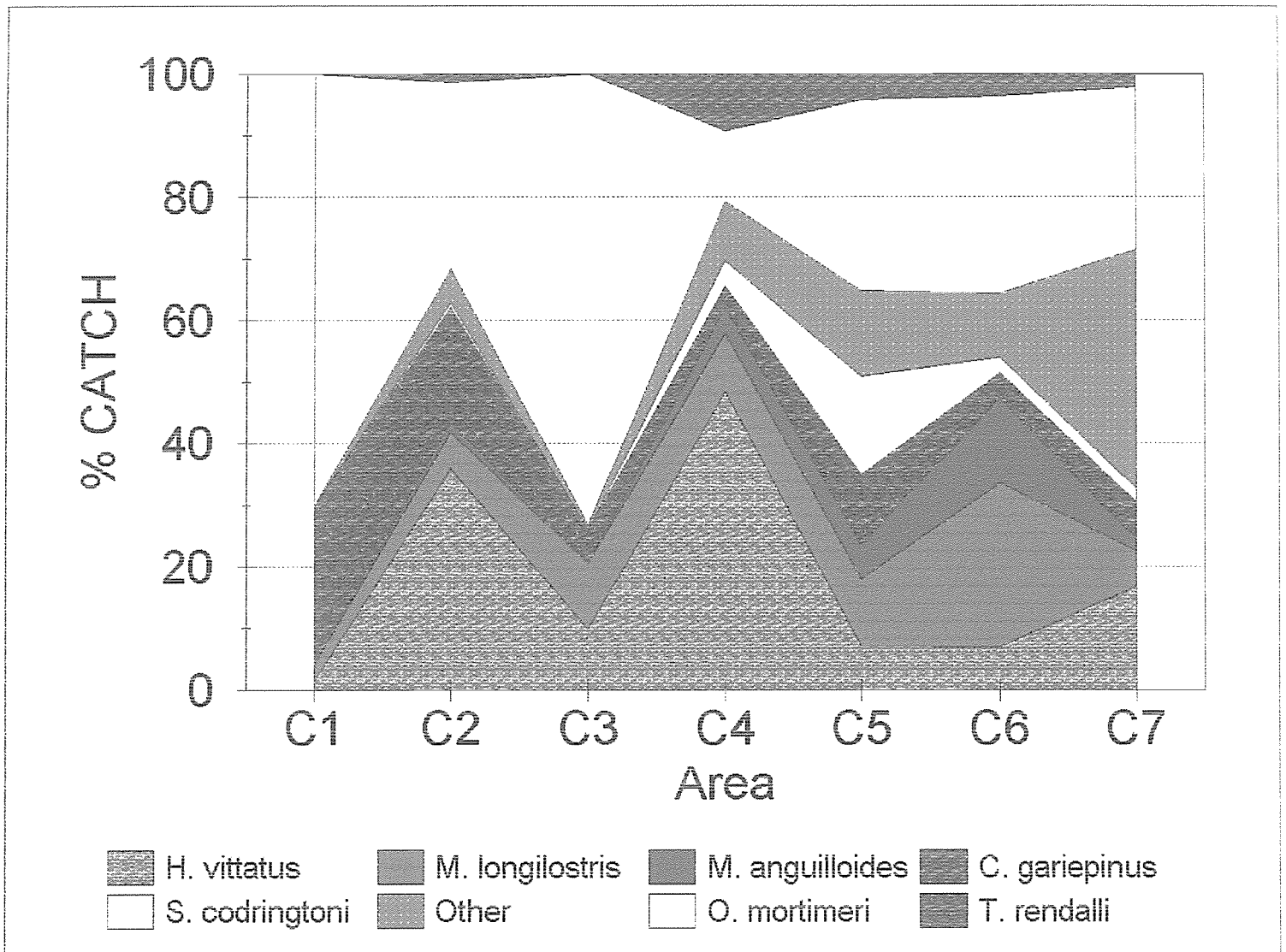
Species Name	Percentage %	Estimated Catch in Tonnes
<i>O. mortimeri</i>	40.5	518.74
<i>H. vittatus</i>	22.5	288.19
<i>C. gariepinus</i>	15.2	194.69
<i>M. longilostris</i>	6.7	85.82
<i>S. codringtoni</i>	3.2	40.99
<i>T. rendalli</i>	2.9	37.14
<i>A. anquilloides</i>	2.6	33.30
<i>L. altivelis</i>	1.9	24.34
<i>S. macrocephalus</i>	1.2	15.37
<i>D. schenga</i>	1.0	12.81
Others	2.3	24.34

Figure 9 : Catch proportions of different species caught in the Inshore area.



Also included under 'Other' is *S. macrocephalus*, *L. altivelis*, *D. schenga*, *D. mossambicus*, *L. congoro* and *H. longifilis*.

Figure 10 : Species composition of inshore landings (% kg) by Area



In Area C3, *O. mortimeri* includes all the breams. In Area C7, *L. altivelis* and *D. schenga* (not shown on the figure) comprise more than 90% of the species coded as 'Other'. *H. vittatus* is dominant in areas which are close to rivers i.e. C2, C4 and C7.

Table 11 : Catch and Effort for areas c1-c7 Fishery, 1983 to 1993

Year	Catch in tonnes	Effort in meters	CPUE
1983	440.14	11 704 309	3.76
1984	619.46	29 109 713	2.13
1985	462.22	22 618 569	2.04
1986	507.57	10 187 115	4.98
1987	1 121.64	7 792 854	14.39
1988	1935.18	10 721 619	18.05
1989	741.12	10 154 940	7.30
1990	635.47	5 773 107	11.01
1991	589.76	7 219 813	8.17
1992	481.94	7 650 951	6.30
1993	495.45		6.13

Table 12 : Catch and Effort for Gache Gache Co-operative Society, 1985 to 1993

YEAR	EFFORT (M)	TOTAL CATCH (TON)	CPUE (KG/100M)
1985	2591639	71.70	2.76
1986	1636286	69.46	4.24
1987	3884326	66.68	1.71
1988	1526070	56.41	3.69
1989	125206	63.74	5.09
1990	973573	57.63	5.91
1991	1143188	38.15	3.33
1992	821730	27.37	3.33
1993	669 150	37.56	5.61

Table 13 : Catch and Effort for Nyaodza Co-operative Society, 1987 to 1993

YEAR	EFFORT (M)	TOTAL CATCH (TON)	CPUE (KG/100M)
1987	2198277	44.31	2.01
1988	431295	16.88	3.91
1989	591000	21.21	3.58
1990	449587	28.92	6.43
1991	393120	31.19	7.93
1992	594559	16.77	2.82
1993	609 820	14.29	2.34

Table 14 : Catch and Effort for Area C1, 1973 to 1993

YEAR	EFFORT (M)	TOTAL CATCH (TON)	CPUE (KG/100M)
1973	4245514	87.77	2.07
1974	4067000	171.12	4.21
1975	5823454	216.14	3.71
1976	4693325	184.89	3.94
1977	2585583	100.17	3.87
1978	4232470	178.57	4.22
1979	3604010	168.15	4.67
1980	3435068	97.37	2.83
1981	2919457	72.17	2.47
1982	2614889	86.99	3.33
1983	3553053	77.73	2.19
1984	4459223	51.55	1.16
1985	2690008	29.9	1.11
1986	1730367	26.11	1.51
1987	2005549	129.15	6.44
1988	2420193	143.35	5.92
1989	2236510	112.77	5.04
1990	1890355	112.55	5.95
1991	1958094	96.91	4.95
1992	1723204	62.91	3.65
1993	1 278 970	51.85	4.05

Table 15 : Catch and Effort for Area C2, 1970 to 1993

YEAR	EFFORT (M)	TOTAL CATCH (TON)	CPUE (KG/100M)
1970	3504045	114.93	3.28
1971	2472359	67.09	2.71
1972	1852147	126.32	6.82
1973	6054815	199.04	3.29
1974	8699007	277.67	3.19
1975	9012427	311.97	3.46
1976	6745253	20.79	3.42
1977	8235006	234.84	2.85
1978	9856397	340.51	3.45
1979	no records	no records	no records
1980	5433118	187.98	3.46
1981	6050384	168.6	2.79
1982	5436199	164.06	3.02
1983	2540788	170.18	6.70
1984	4703577	417.03	8.87
1985	3321195	226.01	6.81
1986	2671602	255.45	9.56
1987	323340	274.01	8.50
1988	2443409	242.02	9.91
1989	2691484	257.55	9.57
1990	1545481	244.46	15.82
1991	1794358	203.81	11.36
1992	1265580	87.64	6.92
1993	1760936	124.9	7.09

Table 16 : Catch and Effort for Area C3, 1973 to 1993

YEAR	EFFORT (M)	TOTAL CATCH (TON)	CPUE (KG/100M)
1973	3456725	97.18	2.81
1974	3473470	124.48	3.58
1975	3389575	78.13	2.30
1976	3079440	80.20	2.60
1977	2489851	75.35	3.03
1978	2616114	120.00	4.59
1979	2000135	119.73	5.99
1980	2452951	101.11	4.12
1981	2091404	66.77	3.19
1982	1642321	50.40	3.06
1983	1530166	37.43	2.44
1984	11503152	21.85	0.19
1985	13333335	16.30	1.22
1986	1180508	22.73	1.93
1987	599099	26.39	4.41
1988	2256450	193.08	8.56
1989	384749	34.93	9.07
1990	510048	30.63	6.01
1991	444296	35.35	7.73
1992	475476	31.83	6.69
1993	332317	20.74	6.24

Table 17 : Catch and Effort for Area C4, 1970 to 1993

YEAR	EFFORT (M)	TOTAL CATCH (TON)	CPUE (KG/100M)
1970	1179609	93.57	7.93
1971	1267308	91.96	7.26
1972	978530	78.15	7.99
1973	1551514	77.15	4.97
1974	1535458	84.21	5.48
1975	736212	58.29	7.92
1976	429982	31.92	7.42
1977	no records	no records	no records
1978	1291114	63.86	4.95
1979	no records	no records	no records
1980	1090772	66.59	6.10
1981	2063793	99.72	4.83
1982	1928563	78.58	4.07
1983	1001906	71.48	7.13
1984	1058426	54.03	5.10
1985	701275	110.01	15.69
1986	619018	709.28	17.65
1987	958678	143.52	14.97
1988	2256450	193.09	8.56
1989	1587782	198.33	12.49
1990	1108323	159.83	14.42
1991	1690667	152.98	9.04
1992	1594995	139.59	8.75
1993	1399595	159.00	11.36

Table 18 : Catch and Effort for Area C5, 1973 to 1993

YEAR	EFFORT (M)	TOTAL CATCH (TON)	CPUE (KG/100M)
1973	3840473	94	2.45
1974	3961230	107	2.70
1975	no records	no records	no records
1976	1094730	70	6.39
1977	no records	no records	no records
1978	no records	no records	no records
1979	no records	no records	no records
1980	574756	100	17.40
1981	21224842	177	8.33
1982	2131082	106	4.97
1983	3078396	83	2.70
1984	7385335	75	1.02
1985	2572756	80	3.11
1986	3985620	94	2.36
1987	1006188	41	4.07
1988	135117	42	3.12
1989	3078394	112	3.64
1990	718900	88	12.24
1991	1112908	78	7.01
1992	2285092	140.98	6.17
1993	935972	96.90	10.35

Table 19: Catch and Effort for Area C6 and C7, 1989 to 1993

YEAR	EFFORT (M)	TOTAL CATCH (TON)	CPUE (KG/100M)
1989	176021	25.54	14.51
1990			
1991	219490	22.71	10.35
1992	306604	18.99	6.19
1993	953951	42.1	4.41

APPENDIX 1

Kapenta return form

LAKE KARIBA FISHERIES RESEARCH INSTITUTE

Company.....

Month.....

Vessel (1).....

(2).....

CATEGORY					A	B	C				
Night	Sardine kg	Tiger kg	No. of hauls	Location	A	B	C	Sardine kg	Tiger kg	No. of hauls	Location
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
Total sardine kgs.....					Total sardine kgs.....						
Total nights.....					Total nights.....						
Total tiger kgs					Total tiger kgs						
Total hauls.....					Total hauls.....						

APPENDIX 2

Summary of Inshore Fishing Gear

Summary of Inshore Fishing Gear

CAMPNAME	NUMBER OF FISHERMEN (1994)	NUMBER OF BOATS (1993)	NUMBER OF NETS (1993)
Gache Gache	22	27	36
Nyaodza	19	11	10
Fothergill	25	18	14
Tsetse Mainland	51	19	220
Tsetse Island	10	8	62
Nematombo	40	15	189
Mudzimu	21	6	55
Nyamhunga	37	11	63
Monga	28	16	152
Dandawa	87	34	368
Kings Camp	28	19	18
Musamba	146	37	346
Chalala	31	10	245
Sibilobilo	57	33	338
Chatikila	12	2	79
Chunga	13	8	20
Nykatanda	27	15	206
Makuyu	41	16	357
Mulange	9	3	-
Sengwa	51	28	181
Mujere	78	25	246
Chimpampa	38	12	180
Chiyobola	18	18	282
Mwenda	37	19	66
Chibuyu	8	3	63
Masumo	13	7	72
Mbila	19	4	30
Chikuyu	2	2	16
Chinzonzo	6	5	38
Lokola	17	9	75
Kabulawu	8	3	16
Tobwe	40	30	128
Malala	24	14	99
Simatelele	25	13	71
Siakabenge	16	14	18
Bimbi	28	17	85
Simambo	24	3	44
Kanonge	16	16	24
Ground	5	2	31
Kalulwe	52	34	56
Total	1 229	586	4 599

APPENDIX 3

Location of Fishing Villages

(Areas)

Location of fishing villages

AREA	CAMPCODE	CAMPNAME	BASIN	CO-OP	FREELANCE
C1	1	Gache Gache	5	X	
	2	Nyaodza	5	X	
C2	3	Fothergill	5	X	
	4	Tsetse Mainland	5		X
	5	Tsetse Island	5	X	
	6	Nematombo	5		X
	7	Mudzimu	5		X
	8	Nyambunga	5		X
	9	Monga	5		X
	10	Dandawa	5		X
C3	11	Kings Camp	4	X	
C4	12	Musamba	4		X
	13	Chalala	4		X
	14	Sibilobilo	4		X
	15	Chatikila			
	16	Chunga	3	X	
C5	17	Nykatanda	3		X
	19	Makuyu	3		X
	20	Mulange	3	X	X
	21	Sengwa	3		X
	22	Mujere	3	X	
	23	Chimpampa	3	X	
	24	Chiyobola	3		X
	25	Mwenda	3	X	
	26	Chibuyu	3		X
C6	27	Masumo	2	X	
	43	Kalulwe	2		X
	28	Mbila	2	X	
C7	29	Chikuyu	2	X	
	30	Chinzonzo	2	X	
	31	Lokola	2		X
	32	Kabulawu	1		X
	33	Tobwe	1	X	
	35	Malala	1	X	
	36	Simatelele	1	X	
	37	Siakabenge	1	X	
	38	Bimbi	1		X
	39	Simambo	1	X	
	40	Kanonge	1	X	
	42	Ground	1	X	X

