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Biomass, Density and Size of Fish of the Lower Order Streams
in the Sepik-Ramu Catchment
Raw Data

A report prepared for project PNG/85/001
Sepik River Fish Sock Enhancement Project

by

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This report was prepared during the course of the project identified in the title page. The conclusions and recommendations given in the report are those considered appropriate at the time of preparation. They may be modified in the light of further knowledge gained at subsequent stages of the project.

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1. INTRODUCTION

The survey on the ecology and biology of the fish fauna of the lower order streams in the Sepik-Ramu catchment commenced on January 1988 as subproject of the Sepik River Fish Stock Enhancement Project (PNG/85/001-09) with a sampling program that extended to mid 1989. This report presents some of the raw data obtained as a result of this survey. These are: data on number of specimens, total weight of specimens, size range and average size per species per sample. A preliminary analysis of these data can be found in van Zwieten (1990a), further analysis will be published in due time.

The survey on the fish fauna of the lower order streams provides a baseline data set onto which future developments in management of the Sepik-Ramu lower order rivers can be set off. Presentation of this raw data set is done for that purpose: future researchers can use it to study e.g. the effects introductions of new species on the existing fish fauna, or effects of other uses of the rivers in the area (mining, logging).

The data presented here are only a part of the complete data set obtained during the survey. A preliminary analysis of the data on stomach contents of the various species can be found in van Zwieten (1990b) and on distribution in van Zwieten (1990c). Physical data of the sample sites with site descriptions are presented in van Zwieten (1989). All other data on single species obtained with the methods described in van Zwieten (1989) are obtained for the elucidation of some aspects of the general biology of each species (seasonality, fecundity, feeding behaviour, interaction with other species etc.), but it was not possible to execute the analysis of these data within the time frame of the project. These data will be presented elsewhere. Preliminary remarks on the general biology of each species are scattered throughout the various project documents.

2. THE DATA SET

The data set presented in the following table are arranged on the date the samples were taken. Biomass and Density are calculated only for those samples in which a complete fish kill was obtained in the sampled section of the river and of which I could reasonably assume to have collected all the fish present.

The columns represent the following:

RIVER : the name of the river. The exact location of the sample site can be found in van Zwieten (1989).

DATE : the date the sample was taken (format month/day/year).

SPECIES : the species code of each species. In general the first two letters of the family and genus name are used as follows:

An.bi.	<u>Anguilla bicolor</u>
An.ma.	<u>Anguilla marmorata</u>
Ar.ve.	<u>Arius velutinus</u>
Bu.gy.	<u>Bunaka gyrinoides</u>
Ch.bu.	<u>Chilatherina bulolo</u>
Ch.ca.	<u>Chilatherina campsi</u>
Ch.cr.	<u>Chilatherina crassispinosa</u>
Ch.fa.	<u>Chilatherina fasciata</u>
Chi.j.	juveniles of <u>Chilatherina</u> species
Cy.ca.	<u>Cyprinus carpio</u>
Ga.af.	<u>Gambusia affinis</u>
Gg.bu.	<u>Glossogobius bulmeri</u>
Gg.sp.	<u>Glossogobius spec.</u>
Gg.17.	<u>Glossogobius spec. 17</u>
Gg.18.	<u>Glossogobius spec. 18</u>
Gl.gj.	<u>Glossamia gjellerupi</u>
Gp.ma.	<u>Glossolepis maculosis</u>
Gp.ra.	<u>Glossolepis ramuensis</u>
He.tr.	<u>Hephaestus transmontanus</u>
Me.af.	<u>Melanotaenia affinis</u>
Mel.j.	juveniles of <u>Melanotaeniidae</u> (both genera <u>Chilatherina</u> and <u>Melanotaenia</u>)
Mo.bl.	<u>Mogurnda bloodi</u>
Mo.ne.	<u>Mogurnda nesolepis</u>
Mo.sp.	<u>Mogurnda n. species</u>
Ne.gc.	<u>Neosilurus gjellerupi coatesi</u>
Ne.gg.	<u>Neosilurus gjellerupi gjellerupi</u>
Ne.id.	<u>Neosilurus idenburgi</u>
Ne.ni.	<u>Neosilurus niger</u>
Op.ap.	<u>Ophieleotris aporos</u>
Or.mo.	<u>Oreochromis mossambicus</u>
Ox.fi.	<u>Oxyeleotris fimbriata</u>
Ox.he.	<u>Oxyeleotris heterodon</u>
Pa.co.	<u>Parambassis confinis</u>
St.la.	<u>Stenogobius laterisquamatus</u>
Ze.ka.	<u>Zenarchopterus kampeni</u>

WEIGHT : Total weight (in gram) of the specimens of that particular species in the sample

NUMBER : Total number of specimens of that particular species in the sample

%WEIGHT : percentage of the weight of that species over the total weight of all species in the sample

%NUMBER :percentage of the number of specimens of that species over the total number of specimens of all species in the sample

BIOMASS :Total weight (in gram) of that species per hectare.

DENSITY :Number of individuals per hectare

MIN_LEN :Minimum standard length of that species in the sample

MAX_LEN :Maximum length of that species in the sample

AVG_LEN :Average length of all the specimens of that species in the sample

3. REFERENCES

Van Zwieten, P.A.M. (1989) Survey of lower order streams in the Sepik and Ramu basin 1988 - 1989: description of methods and sample sites. Sepik River Fish Stock Enhancement Project, PNG/85/001, Field Document No. 7, FAO, Rome

Van Zwieten, P.A.M. (1990a) Preliminary analysis of biomass, density and distribution of fish in tributaries and hillstreams of the Sepik-Ramu river system (Papua New Guinea) in: Hirano, R and I. Hanyu, eds. The Second Asian Fisheries Forum, Asian Fisheries Society, Manila, Philippines, 829 - 833

Van Zwieten, P.A.M. (1990b) Preliminary analysis of stomach contents of various fish species from the lower order streams in the Sepik-Ramu basin and identification of vacant and underutilised trophic niches. Sepik River Fish Stock Enhancement Project, PNG/85/001, Field Document No. 8, FAO, Rome

Van Zwieten (1990c) Distribution, altitudinal range and abundance of the fish species in the lower/order streams of the Sepik-Ramu catchment. Sepik River Fish Stock Enhancement Project, PNG/85/001, Field Document No. 9, FAO, Rome

RIVER	DATE	SPECIES	WEIGHT	NUMBER	PER_WT	PER_NUM	BIOMASS	DENSITY	MIN_LEN	MAX_LEN	AVG_LEN
Munjim	01/27/88	An.bi.	171	1	7.1	0.2	1901	11	445	445	445
	01/27/88	Ch.fa.	2083	427	87.0	96.6	23140	4744	20	109	64
	01/27/88	Gg.sp.	1	1	0.0	0.2	9	11			
	01/27/88	Gl.gj.	10	3	0.4	0.7	114	33	45	56	51
	01/27/88	He.tr.	37	6	1.6	1.4	412	67	55	74	63
	01/27/88	Ne.gc.	72	3	3.0	0.7	802	33	107	166	131
	01/27/88	Pa.co.	19	1	0.8	0.2	216	11			89
		TOTAL	2394	442			26594	4911			
Nagam	01/27/88	Ar.ve.	28	1	18.1	5.6			120	120	120
	01/27/88	Ch.cr.	42	10	27.0	55.6			40	85	67
	01/27/88	Gl.gj.	69	5	43.9	27.8			57	112	75
	01/27/88	Pa.co.	14	1	8.7	5.6					80
	01/27/88	Ze.ka.	4	1	2.4	5.6					79
		TOTAL	157	18							
Kambagora	01/28/88	Ch.fa.	17	59	3.3	9.9			24	73	35
	01/28/88	Gl.gj.	253	60	50.8	10.1			10	108	36
	01/28/88	Me.j.	1	39	0.2	6.6					
	01/28/88	Me.af.	63	95	12.6	16.0			12	107	26
	01/28/88	Mo.ne.	86	325	17.2	54.6					
	01/28/88	Ox.fi.	79	17	15.9	2.9					
		TOTAL	497	595							
Kamasau	01/28/88	Ch.fa.	6	6	22.0	6.3			24	73	35
	01/28/88	Gl.gj.	3	26	11.1	27.4			8	30	14
	01/28/88	Me.af.	14	19	49.1	20.0			15	72	32
	01/28/88	Mo.ne.	5	44	17.8	46.3					
		TOTAL	29	95							
Saranandi	02/02/88	An.bi.	1326	10	46.0	2.3	78899	595	219	521	353
	02/02/88	Ch.fa.	429	189	14.9	43.2	25560	11250	10	95	44
	02/02/88	Gl.gj.	627	74	21.8	16.9	37310	4405	10	142	55
	02/02/88	Me.af.	158	108	5.5	24.7	9387	6429	11	96	36
	02/02/88	Op.ap.	117	50	4.0	11.4	6935	2976			
	02/02/88	Or.mo.	223	6	7.8	1.4	13286	357	74	119	102
		TOTAL	2879	437			171375	26012			
Karanas	02/03/88	An.bi.	34	1	13.4	0.9	3276	96	237	462	348
	02/03/88	Bu.gy.	167	1	65.2	0.9	15948	96			
	02/03/88	Gl.gj.	11	1	4.1	0.9	1015	96			65
	02/03/88	Me.af.	42	87	16.4	82.1	4004	8333	10	75	27
	02/03/88	Mo.ne.	2	16	0.9	15.1	230	1533			
		TOTAL	256	106			24473	10153			
Patananga	02/03/88	An.bi.	555	5	72.5	2.9	27556	248	253	452	349
	02/03/88	Ch.fa.	23	13	3.0	7.5	1138	646	40	60	49
	02/03/88	Gl.gj.	1	3	0.1	1.7	40	149	11	24	18
	02/03/88	Me.af.	43	82	5.7	47.4	2156	4074	10	64	28
	02/03/88	Mo.ne.	1	3	0.1	1.7	40	149			
	02/03/88	Or.mo.	142	67	18.6	38.7	7059	3328	9	68	35
		TOTAL	765	173			37988	8594			
Wandomi	02/04/88	An.bi.	434	4	40.4	2.7	24252	224	256	432	331
	02/04/88	Gl.gj.	143	31	13.3	20.7	7989	1734	12	103	33

RIVER	DATE	SPECIES	WEIGHT	NUMBER	PER_WT	PER_NUM	BIOMASS	DENSITY	MIN_LEN	MAX_LEN	AVG_LEN
	02/04/88	Mo.ne.	27	77	2.5	51.3	1516	4308			
	02/04/88	Me.ni.	4	1	0.3	0.7	207	56			
	02/04/88	Op.ap.	192	2	17.9	1.3	10758	112			
	02/04/88	Or.mo.	273	35	25.4	23.3	15256	1958	27	98	57
		TOTAL	1072	150			59978	8392			
Wisisir	02/04/88	Mo.ne.	49	44	100.0	100.0	3800	3419			
		TOTAL	49	44			3800	3419			
Jakuin	02/10/88	An.ma.	1025	1	90.3	2.1	52203	51			
	02/10/88	Mo.bl.	110	47	9.7	97.9	5623	2394			
		TOTAL	1135	48			57825	2445			
Mere	02/10/88	Me.af.	609	689	97.6	99.9	6825	7717	14	77	32
	02/10/88	Ox.fi.	15	1	2.4	0.1	168	11			
		TOTAL	624	690			6993	7728			
Malas	02/11/88	Ch.fa.	70	17	6.4	8.1	3361	820	47	81	64
	02/11/88	Gg.sp.	3	2	0.3	0.9	135	96			
	02/11/88	Gl.gj.	312	23	28.5	10.9	15024	1109	53	122	71
	02/11/88	Me.af.	380	110	34.8	52.1	18332	5304	17	100	53
	02/11/88	Mo.ne.	19	49	1.7	23.2	921	2363			
	02/11/88	Me.gc.	13	1	1.2	0.5	641	48			
	02/11/88	Or.mo.	297	9	27.1	4.3	14315	434	91	115	102
		TOTAL	1094	211			52729	10174			
Behibiups	02/12/88	Ch.cr.	17	5	18.3	13.2			54	75	61
	02/12/88	Ch.fa.	10	3	10.7	7.9			9	68	35
	02/12/88	Gl.gj.	4	1	4.3	2.6					52
	02/12/88	Me.af.	19	19	20.9	50.0			11	68	36
	02/12/88	Mo.ne.	3	9	3.3	23.7					
	02/12/88	Or.mo.	40	1	42.5	2.6					106
		TOTAL	93	38							
Marinjang	02/12/88	An.bi.	1014	11	93.6	4.3	51084	554	236	524	313
	02/12/88	Me.af.	65	232	6.0	91.7	3291	11694	15	53	26
	02/12/88	Mo.bl.	1	1	0.1	0.4	50	50			
	02/12/88	Mo.ne.	3	9	0.3	3.6	166	454			
		TOTAL	1083	253			54592	12752			
Olpain	02/12/88	Ch.fa.	77	32	8.6	9.6	3897	1626	22	85	53
	02/12/88	Gg.lB.	6	3	0.7	0.9	316	152			
	02/12/88	Gg.bu.	7	2	0.8	0.6	368	102			
	02/12/88	Gl.gj.	166	14	18.5	4.2	8410	711	46	99	69
	02/12/88	Me.af.	191	119	21.3	35.6	9680	6047	11	67	43
	02/12/88	Mo.ne.	43	98	4.8	29.3	2190	4980			
	02/12/88	Op.ap.	20	2	2.2	0.6	1021	102			
	02/12/88	Or.mo.	384	64	43.0	19.2	19527	3252	38	81	52
		TOTAL	894	334			45410	16972			
Hohosa	02/27/88	An.bi.	591	5	17.4	1.7			234	446	349
	02/27/88	Ch.fa.	281	116	8.3	38.3			10	92	50
	02/27/88	Gg.lB.	30	42	0.9	13.9					
	02/27/88	Gl.gj.	209	54	6.2	17.8			11	88	45
	02/27/88	He.tr.	84	8	2.5	2.6			34	96	68

RIVER	DATE	SPECIES	WEIGHT	NUMBER	PER_WT	PER_NUM	BIOMASS	DENSITY	MIN_LEN	MAX_LEN	AVG_LEN
	02/27/88	We.af.	57	18	1.7	5.9			20	82	52
	02/27/88	We.gc.	683	17	20.1	5.6			96	234	142
	02/27/88	Dr.mo.	1454	43	42.9	14.2			34	146	96
		TOTAL	3388	303							
Amuk	03/02/88	Ar.ve.	3304	41	66.6	23.4	44356	550	118	232	160
	03/02/88	Ch.cr.	26	12	0.5	6.9	354	161	20	86	46
	03/02/88	Gg.sp.	1	2	0.0	1.1	16	27			
	03/02/88	Gl.gj.	45	11	0.9	6.3	607	148	29	72	48
	03/02/88	Dr.mo.	66	4	1.3	2.3	890	54	57	84	74
	03/02/88	Pa.co.	1517	105	30.6	60.0	20363	1410	39	98	76
		TOTAL	4959	175			66586	2350			
Mihambaum	03/03/88	Ch.fa.	591	225	31.8	66.0			15	107	49
	03/03/88	Gg.bu.	3	3	0.2	0.9					
	03/03/88	Gl.gj.	16	3	0.8	0.9			47	69	60
	03/03/88	We.gc.	1224	108	65.9	31.7			76	177	104
	03/03/88	Ox.fi.	24	2	1.3	0.6					
		TOTAL	1857	341							
Sikau	03/03/88	An.bi.	843	1	59.2	5.6			752	752	752
	03/03/88	Gg.bu.	5	2	0.4	11.1					
	03/03/88	We.gc.	479	10	33.6	55.6			135	192	165
	03/03/88	Dr.mo.	76	2	5.3	11.1			100	110	105
	03/03/88	Pa.co.	22	3	1.5	16.7			61	66	63
		TOTAL	1425	18							
Warapun	03/04/88	An.bi.	441	3	91.3	7.3			232	467	350
	03/04/88	Ch.cr.	27	23	5.6	56.1			12	63	42
	03/04/88	Gg.sp.	3	6	0.6	14.6					
	03/04/88	Gl.gj.	7	5	1.4	12.2			33	49	39
	03/04/88	He.tr.	0	1	0.1	2.4					
	03/04/88	We.af.	5	3	1.0	7.3			41	52	46
		TOTAL	483	41							
Creek Nagam	03/10/88	Gl.gj.	168	69	38.2	63.3	5680	2327	14	93	37
	03/10/88	He.tr.	18	3	4.0	2.8	597	101	49	71	56
	03/10/88	Dr.mo.	144	7	32.7	6.4	4860	236	62	95	77
	03/10/88	Pa.co.	46	11	10.3	10.1	1535	371	26	67	49
	03/10/88	Ze.ka.	65	19	14.8	17.4	2196	641	56	117	74
		TOTAL	441	109			14867	3676			
Munjim	03/22/88	Ar.ve.	292	7	10.9	1.6	3733	89	59	217	103
	03/22/88	Ch.fa.	1912	373	71.0	85.2	24407	4762	20	113	63
	03/22/88	Gl.gj.	10	4	0.4	0.9	126	51	28	53	42
	03/22/88	He.tr.	9	3	0.3	0.7	117	38	18	67	36
	03/22/88	Pa.co.	280	24	10.4	5.5	3575	306	56	82	74
	03/22/88	Ze.ka.	188	27	7.0	6.2	2400	345	50	149	90
		TOTAL	2691	438			34358	5592			
Jilik	03/23/88	An.bi.	84	3	20.3	9.4	929	33	196	298	247
	03/23/88	Gl.gj.	110	7	26.6	21.9	1217	77	55	167	84
	03/23/88	He.tr.	137	18	33.2	56.3	1515	199	56	82	66
	03/23/88	We.gc.	69	3	16.5	9.4	756	33	117	152	132
	03/23/88	Pa.co.	14	1	3.3	3.1	152	11			77

RIVER	DATE	SPECIES	WEIGHT	NUMBER	PER_WT	PER_NUM	BIOMASS	DENSITY	MIN_LEN	MAX_LEN	AVG_LEN
			414	32			4571	353			
Assina	03/24/88	Ch.cr.	207	135	71.8	97.1			49	100	75
	03/24/88	Gg.sp.	1	1	0.4	0.7					
	03/24/88	Gl.gj.	48	1	16.8	0.7					114
	03/24/88	He.tr.	7	1	2.4	0.7					63
	03/24/88	Pa.co.	25	1	8.7	0.7			90	90	90
		TOTAL		288	139						
Meneko	03/24/88	He.tr.	8	1	3.4	4.3					
	03/24/88	Me.gc.	22	1	9.7	4.3					
	03/24/88	Pa.co.	201	21	86.9	91.3			51	86	70
		TOTAL		231	23						
Numalib	03/27/88	Ch.cr.	335	220	46.8	73.6	6954	4574	16	96	40
	03/27/88	Gg.sp.	5	4	0.7	1.3	98	83			
	03/27/88	Gl.gj.	340	65	47.7	21.7	7075	1351	17	128	50
	03/27/88	He.tr.	1	1	0.1	0.3	19	21			35
	03/27/88	Or.mo.	20	5	2.8	1.7	422	104	34	56	47
	03/27/88	Pa.co.	13	4	1.9	1.3	277	83	34	67	45
		TOTAL		714	299		14844	6216			
Emmacreek	04/24/88	Chi.j.	72	645	1.4	24.8	1029	9200			
	04/24/88	Ch.ca.	103	135	2.0	5.2	1464	1926	16	55	37
	04/24/88	Ch.cr.	1	1	0.0	0.0	12	14			
	04/24/88	Ch.fa.	302	294	5.9	11.3	4312	4193	18	80	38
	04/24/88	Cy.ca.	1123	51	21.8	2.0	16022	727			
	04/24/88	Gg.17.	159	22	3.1	0.8	2272	314			
	04/24/88	Gl.gj.	1635	100	31.8	3.9	23319	1426	19	120	66
	04/24/88	Gp.ma.	18	66	0.3	2.5	255	941	25	48	32
	04/24/88	He.tr.	2	1	0.0	0.0	26	14			
	04/24/88	Me.af.	779	839	15.1	32.3	11107	11967	15	83	37
	04/24/88	Mo.ne.	88	418	1.7	16.1	1253	5962	11	45	20
	04/24/88	Op.ap.	649	9	12.6	0.3	9253	128			
	04/24/88	Or.mo.	152	4	2.9	0.2	2162	57	83	119	105
	04/24/88	Ox.he.	57	8	1.1	0.3	807	114			
	04/24/88	Ze.ka.	4	3	0.1	0.1	61	43	73	84	78
	TOTAL		5143	2596		73355	37028				
Leng	04/27/88	Ch.ca.	419	462	46.3	46.5	6165	6794	29	65	40
	04/27/88	Gg.17.	21	17	2.3	1.7	309	250			
	04/27/88	Me.af.	214	170	23.7	17.1	3153	2500			
	04/27/88	Mo.ne.	250	345	27.7	34.7	3682	5074			
		TOTAL		905	994		13309	14618			
Faria	04/28/88	Ch.cr.	34	65	17.5	69.1					
	04/28/88	Ga.sp.	3	10	1.5	10.6					
	04/28/88	Gg.sp.	0	1	0.2	1.1					
	04/28/88	Gl.gj.	1	1	0.4	1.1					
	04/28/88	Ne.ni.	1	2	0.3	2.1					
	04/28/88	Or.mo.	155	15	80.2	16.0			26	83	58
	TOTAL		193	94							
Koje	05/01/88	An.bi.	1345	4	94.0	8.3	39629	118	400	711	515
	05/01/88	Ch.bu.	67	40	4.7	83.3	1987	1178			

RIVER	DATE	SPECIES	WEIGHT	NUMBER	PER_WT	PER_NUM	BIOMASS	DENSITY	MIN_LEN	MAX_LEN	AVG_LEN
	05/01/88	Ch.ca.	7	2	0.5	4.2	212	59	62	66	64
	05/01/88	Ch.cr.	8	1	0.5	2.1	227	29			
	05/01/88	Gl.gj.	0	0	0.0	0.0	0	0			
	05/01/88	Me.af.	3	1	0.2	2.1	101	29	17	86	42
	05/01/88	Mo.ne.	0	0	0.0	0.0	0	0	13	47	28
	05/01/88	Ne.id.	0	0	0.0	0.0	0	0			
		TOTAL	1431	48			42156	1414			
Mattev creek	05/03/88	An.bi.	1261	3	42.4	0.3	82689	197	294	542	418
	05/03/88	Ch.bu.	17	17	0.6	1.6	1083	1115	20	66	33
	05/03/88	Ch.ca.	92	61	3.1	5.8	6043	4000	28	58	46
	05/03/88	Ch.fa.	313	172	10.5	16.4	20498	11279	18	84	45
	05/03/88	Gg.17.	1	1	0.0	0.1	35	66	19	42	34
	05/03/88	Gl.gj.	751	67	25.2	6.4	49249	4393	39	106	64
	05/03/88	Gp.ma.	8	7	0.3	0.7	517	459	32	52	41
	05/03/88	He.tr.	31	5	1.0	0.5	2045	328	42	80	56
	05/03/88	Hel.j.	16	222	0.5	21.2	1024	14557			
	05/03/88	Me.af.	199	221	6.7	21.1	13049	14492	13	77	33
	05/03/88	Mo.ne.	72	262	2.4	25.0	4730	17180	9	49	21
	05/03/88	Ne.ni.	37	6	1.3	0.6	2453	393	66	85	79
	05/03/88	Op.ap.	160	2	5.4	0.2	10465	131			
	05/03/88	Ox.fi.	20	1	0.7	0.1	1318	66			
		TOTAL	2977	1047			195198	68656			
Mon	05/03/88	Gl.gj.	49	14	14.7	6.6	1568	448	33	67	47
	05/03/88	Me.af.	136	107	40.9	50.5	4362	3426	13	71	38
	05/03/88	Mo.ne.	43	68	13.0	32.1	1389	2177	18	49	29
	05/03/88	Ne.gg.	100	21	29.9	9.9	3191	672	50	158	66
	05/03/88	Ne.ni.	5	2	1.4	0.9	145	64			
		TOTAL	333	212			10656	6788			
Auro	05/04/88	Ch.ca.	7	7	0.6	6.8					
	05/04/88	Gg.18.	2	4	0.2	3.9					
	05/04/88	Gl.gj.	571	55	54.9	53.4					
	05/04/88	Me.af.	12	9	1.2	8.7					
	05/04/88	Mo.ne.	3	16	0.3	15.5					
	05/04/88	Ne.id.	18	2	1.8	1.9			66	101	84
	05/04/88	Or.mo.	427	10	41.1	9.7			53	132	102
		TOTAL	1040	103							
Maran	05/06/88	An.bi.	305	8	9.6	1.3	7220	189	151	436	222
	05/06/88	Ch.ca.	77	27	2.4	4.4	1824	638			
	05/06/88	Ch.fa.	519	81	16.3	13.1	12267	1915	14	103	65
	05/06/88	Cy.ca.	55	1	1.7	0.2	1294	24			
	05/06/88	Gg.18.	15	50	0.5	8.1	360	1182	17	32	26
	05/06/88	Gl.gj.	946	95	29.8	15.4	22370	2246	10	142	53
	05/06/88	Gp.ra.	115	100	3.6	16.2	2718	2364	30	63	42
	05/06/88	He.tr.	140	9	4.4	1.5	3317	213	55	99	79
	05/06/88	Me.af.	264	125	8.3	20.2	6252	2955	20	86	44
	05/06/88	Mo.ne.	12	44	0.4	7.1	280	1040	16	34	24
	05/06/88	Ne.id.	60	2	1.9	0.3	1412	47	123	146	135
	05/06/88	Or.mo.	527	27	16.6	4.4	12459	638	59	118	82
	05/06/88	Pa.co.	13	43	0.4	7.0	306	1017	44	81	65
	05/06/88	Ze.ka.	129	6	4.1	1.0	3048	142	150	171	102
		TOTAL	3178	618			75128	14610			

RIVER	DATE	SPECIES	WEIGHT	NUMBER	PER_WT	PER_NUM	BIOMASS	DENSITY	MIN_LEN	MAX_LEN	AVG_LEN
Ofri	05/08/88	Ar.ve.	0	0	0.0	0.0	0	0			
	05/08/88	Ch.fa.	11	14	0.5	13.6	198	254			
	05/08/88	Cy.ca.	0	0	0.0	0.0	0	0			
	05/08/88	Gg.l7.	0	0	0.0	0.0	0	0			
	05/08/88	Gl.gj.	166	13	7.5	12.6	3001	236			
	05/08/88	He.tr.	71	12	3.2	11.7	1290	218	42	86	62
	05/08/88	He.af.	5	13	0.2	12.6	97	236			
	05/08/88	Op.ap.	4	2	0.2	1.9	73	36			
	05/08/88	Or.oo.	1941	48	87.5	46.6	35185	870	10	181	87
	05/08/88	Ze.ka.	20	1	0.9	1.0	368	18			170
		TOTAL	2218	103			40212	1867			
Kamasau	05/18/88	Ch.fa.	256	55	29.7	43.0			16	96	62
	05/18/88	Gl.gj.	503	51	58.2	39.8			12	124	55
	05/18/88	He.tr.	45	15	5.2	11.7			23	96	51
	05/18/88	Mo.ne.	0	2	0.1	1.6			11	35	19
	05/18/88	Ne.gc.	58	4	6.8	3.1			93	133	109
	05/18/88	Ox.fi.	1	1	0.1	0.8					
		TOTAL	864	128							
Saranandi	05/18/88	An.bi.	559	7	16.8	0.9	16927	212	195	458	307
	05/18/88	Bu.gy.	2	1	0.1	0.1	66	30			
	05/18/88	Ch.fa.	9	2	0.3	0.3	284	61	66	70	68
	05/18/88	Gl.gj.	513	76	15.4	9.6	15546	2301	23	99	54
	05/18/88	He.af.	309	106	9.3	13.4	9363	3209	35	91	57
	05/18/88	Mo.bl.	53	16	1.6	2.0	1614	484			
	05/18/88	Mo.ne.	161	424	4.8	53.5	4878	12837	13	47	26
	05/18/88	Ne.ni.	29	1	0.9	0.1	879	30			
	05/18/88	Op.ap.	1002	145	30.1	18.3	30332	4390	31	135	59
	05/18/88	Or.oo.	695	14	20.8	1.8	21027	424	40	150	103
		TOTAL	3333	792			100916	23978			
Jakuananga	05/19/88	An.bi.	624	9	17.4	0.6	21672	313	217	395	291
	05/19/88	Ch.fa.	280	320	7.8	22.0	9731	11123			
	05/19/88	Gl.gj.	579	74	16.1	5.1	20123	2572			
	05/19/88	He.af.	1238	969	34.5	66.6	43030	33681			
	05/19/88	Mo.ne.	146	5	4.1	0.3	5075	174			
	05/19/88	Ne.ni.	128	20	3.6	1.4	4442	695	57	102	77
	05/19/88	Or.oo.	594	59	16.5	4.1	20630	2051	22	98	59
		TOTAL	3588	1456			124704	50608			
Mihanbaum	05/25/88	Chi.j.	27	176	1.4	23.3	236	1556			
	05/25/88	Ch.cr.	432	285	22.8	37.7	3816	2520	25	101	62
	05/25/88	Ch.fa.	164	50	8.7	6.6	1453	442	27	991	69
	05/25/88	Gg.bu.	2	4	0.1	0.5	21	35			
	05/25/88	Gl.gj.	415	158	21.9	20.9	3668	1397	13	128	51
	05/25/88	Mo.ne.	1	1	0.0	0.1	6	9			
	05/25/88	Ne.gc.	851	80	44.9	10.6	7522	707	41	250	82
	05/25/88	Ox.fi.	3	1	0.2	0.1	30	9			
		TOTAL	1895	755			16752	6676			
Numalib	05/20/88	Gg.bu.	3	1	3.0	25.0					
	05/20/88	Or.oo.	104	3	97.0	75.0			97	108	103
		TOTAL	107	4							

RIVER	DATE	SPECIES	WEIGHT	NUMBER	PER_WT	PER_NUM	BIOMASS	DENSITY	MIN_LEN	MAX_LEN	AVG_LEN
Biahin	05/26/88	Gg. 1B.	3	4	15.4	50.0					
	05/26/88	Gg. sp.	2	3	9.5	37.5					
	05/26/88	Me. gc.	15	1	75.1	12.5					117
		TOTAL	20	8							
Jakuananga	07/04/88	An. bi.	768	12	37.6	3.1	30362	474	189	351	290
	07/04/88	Ch. fa.	115	42	5.6	11.0	4543	1660			
	07/04/88	Gl. gj.	411	83	20.1	21.7	16240	3281			
	07/04/88	Me. af	123	83	6.0	21.7	4843	3281			
	07/04/88	Mo. ne.	41	142	2.0	37.1	1633	5613			
	07/04/88	Me. ni.	35	3	1.7	0.8	1372	119	85	114	95
	07/04/88	Op. ap.	27	9	1.3	2.3	1051	356			
	07/04/88	Or. no.	525	9	25.7	2.3	20741	356	45	212	84
	TOTAL	2044	383			80785	15138				
Saramandi	07/04/88	An. bi.	602	5	14.2	0.7	20408	170	231	488	341
	07/04/88	Ch. fa.	1618	299	38.1	43.0	54879	10144	12	104	65
	07/04/88	Gl. gj.	261	32	6.2	4.6	8863	1086	17	108	54
	07/04/88	Me. af.	476	101	11.2	14.5	16160	3427	13	101	56
	07/04/88	Mo. bl.	11	2	0.3	0.3	378	68			
	07/04/88	Mo. ne.	59	111	1.4	16.0	2016	3766	21	40	31
	07/04/88	Op. ap.	724	133	17.1	19.1	24573	4512	35	159	57
	07/04/88	Or. no.	479	11	11.3	1.6	16259	373	32	195	70
	07/04/88	Ox. fi.	16	1	0.4	0.1	536	34			
		TOTAL	4247	695			144073	23579			
Kaabagora	07/05/88	Ch. fa.	211	140	10.7	20.6	4887	3236	17	88	38
	07/05/88	Gl. gj.	1307	81	65.9	11.9	30202	1872	9	192	61
	07/05/88	Mel. j.	24	202	1.2	29.7	559	4669			
	07/05/88	Me. af.	320	90	16.1	13.2	7390	2080	15	126	37
	07/05/88	Mo. ne.	49	135	2.5	19.9	1143	3120	13	41	26
	07/05/88	Ox. fi.	72	32	3.6	4.7	1656	740	14	132	27
		TOTAL	1983	680			45838	15717			
Munjia	07/05/88	An. bi.	686	2	37.2	1.9	11456	33	423	575	499
	07/05/88	Ar. ve.	359	16	19.4	15.4	5986	267	67	192	96
	07/05/88	Ch. cr.	170	35	9.2	33.7	2833	584	33	88	68
	07/05/88	Ch. fa.	104	19	5.6	18.3	1728	317	26	91	69
	07/05/88	Gg. 17.	1	3	0.1	2.9	19	50			
	07/05/88	Gl. gj.	90	5	4.9	4.8	1505	83	45	110	73
	07/05/88	He. tr.	42	5	2.3	4.8	703	83	40	111	62
	07/05/88	Or. no.	133	1	7.2	1.0	2214	17			
	07/05/88	Pa. co.	86	7	4.7	6.7	1438	117			
	07/05/88	Ze. ka.	174	11	9.4	10.6	2897	184	112	201	147
	TOTAL	1844	104			30780	1736				
Biahin	07/07/88	An. bi.	809	5	73.9	14.7			239	632	356
	07/07/88	Ch. cr.	3	2	0.3	5.9			22	71	47
	07/07/88	He. tr.	284	27	25.9	79.4			32	93	71
		TOTAL	1096	34							
Mihambaum	07/08/88	An. bi.	219	1	38.5	0.9			452	452	452
	07/08/88	Ch. cr.	54	51	9.5	43.6			36	97	50
	07/08/88	Ch. fa.	43	13	7.6	11.1					

RIVER	DATE	SPECIES	WEIGHT	NUMBER	PER_WT	PER_NUM	BIOMASS	DENSITY	MIN_LEN	MAX_LEN	AVG_LEN
	07/08/88	Gg.sp.	0	1	0.0	0.9					
	07/08/88	G1.gj.	172	36	30.3	30.8			26	96	54
	07/08/88	He.tr.	18	8	3.2	6.8					85
	07/08/88	Ne.gc.	62	7	10.9	6.0			36	161	74
		TOTAL	568	117							
Ennacreek	07/31/88	An.bi.	824	2	20.2	0.1	11667	28	459	596	528
	07/31/88	Bu.gy.	25	1	0.6	0.0	351	14			
	07/31/88	Ch.bu.	6	29	0.2	0.9	88	411	21	30	26
	07/31/88	Ch.ca.	6	7	0.1	0.2	85	99	32	45	39
	07/31/88	Ch.fa.	158	204	3.9	6.4	2240	2889	17	65	36
	07/31/88	G1.gj.	1383	83	34.0	2.6	19583	1175	24	131	73
	07/31/88	Gp.ma.	4	6	0.1	0.2	50	85	28	40	35
	07/31/88	Mel.j.	106	705	2.6	22.0	1507	9983			
	07/31/88	Me.af.	1188	879	29.2	27.4	16825	12447	15	85	38
	07/31/88	Mo.ne.	238	1274	5.8	39.7	3370	18040	11	43	26
	07/31/88	Ne.ni.	15	1	0.4	0.0	209	14			
	07/31/88	Op.ap.	109	11	2.7	0.3	1548	156	46	114	74
	07/31/88	Or.mo.	8	8	0.2	0.2	119	113			
		TOTAL	4071	3210			57641	45455			
Koje	08/01/88	Ch.ca.	25	7	2.2	0.8	925	260	48	73	60
	08/01/88	Ch.cr.	511	347	44.3	39.2	18972	12876	10	78	41
	08/01/88	Gg.bu.	43	51	3.7	5.8	1581	1892	14	59	33
	08/01/88	G1.gj.	179	49	15.5	5.5	6629	1818	13	91	42
	08/01/88	Me.af.	201	93	17.4	10.5	7471	3451	22	86	42
	08/01/88	Mo.ne.	176	334	15.2	37.7	6522	12393	13	47	28
	08/01/88	Ne.id.	20	4	1.8	0.5	760	148	50	236	100
		TOTAL	1155	885			42861	32839			
Maran	08/03/88	An.bi.	0	0	0.0	0.0	0	0			
	08/03/88	Ch.fa.	296	88	19.3	21.9	7005	2080	16	95	50
	08/03/88	Gg.18.	9	14	0.6	3.5	210	331			
	08/03/88	G1.gj.	692	75	45.2	18.7	16358	1773	18	141	53
	08/03/88	Gp.ma.	30	20	2.0	5.0	712	473	30	57	46
	08/03/88	Me.af.	467	197	30.5	49.0	11043	4657	16	93	45
	08/03/88	Mo.ne.	1	3	0.1	0.7	22	71			
	08/03/88	Ne.ni.	35	3	2.3	0.7	829	71	74	111	95
	08/03/88	Ox.fi.	1	2	0.1	0.5	31	47			
		TOTAL	1532	402			36210	9504			
Nom	08/04/88	Me.af.	327	87	99.6	97.8			38	91	54
	08/04/88	Mo.ne.	1	2	0.4	2.2			28	32	30
		TOTAL	328	89							
Hapia	08/08/88	Ch.bu.	283	235	14.8	52.6					
	08/08/88	Gg.17.	37	3	1.9	0.7					
	08/08/88	G1.gj.	203	36	10.7	8.1					
	08/08/88	He.tr.	364	41	19.1	9.2					
	08/08/88	Me.af.	6	4	0.3	0.9					
	08/08/88	Ne.ni.	13	15	0.7	3.4					
	08/08/88	Or.mo.	989	112	51.9	25.1			11	120	56
	08/08/88	Pa.co.	12	1	0.6	0.2					
		TOTAL	1906	447							

RIVER	DATE	SPECIES	WEIGHT	NUMBER	PER_WT	PER_NUM	BIDMASS	DENSITY	MIN_LEN	MAX_LEN	AVG_LEN
Kamasau	09/01/88	Ch. fa.	1963	646	38.5	53.9	14120	4647	17	99	57
	09/01/88	Gg. bu.	25	11	0.5	0.9	180	79			
	09/01/88	Gl. gj.	1339	137	26.2	11.4	9632	985	20	126	62
	09/01/88	He. tr.	1022	224	20.0	18.7	7349	1611	22	91	50
	09/01/88	Me. af.	106	44	2.1	3.7	763	317	20	84	49
	09/01/88	Mo. bl.	2	1	0.0	0.1	12	7			
	09/01/88	Mo. ne.	43	120	0.8	10.0	311	863	15	40	28
	09/01/88	Me. gc.	582	10	11.4	0.8	4186	72	68	260	156
	09/01/88	Ox. fi.	20	6	0.4	0.5	142	43	23	82	45
			TOTAL	5101	1199			36696	8625		
Saramandi	09/02/88	An. bi.	481	2	25.7	0.3	18552	77	415	482	449
	09/02/88	Ch. fa.	292	137	15.6	18.6	11253	5285	11	96	44
	09/02/88	Gl. gj.	182	49	9.8	6.7	7033	1890	11	86	41
	09/02/88	Mel. j.	13	181	0.7	24.6	520	6983			
	09/02/88	Me. af.	302	209	16.2	28.4	11664	8063	12	89	34
	09/02/88	Mo. ne.	31	59	1.7	8.0	1206	2276	15	49	29
	09/02/88	Op. ap.	264	14	14.1	1.9	10170	540			
	09/02/88	Dr. mo.	304	85	16.2	11.5	11710	3279	16	72	42
			TOTAL	1869	736			72108	28395		
Arai	09/05/88	An. bi.	100	2	13.9	11.1					
	09/05/88	Ar. ve.	79	1	11.0	5.6					
	09/05/88	Ch. cr.	14	1	2.0	5.6					
	09/05/88	Gl. gj.	34	3	4.8	16.7					
	09/05/88	Mo. bl.	25	2	3.5	11.1					
	09/05/88	Op. ap.	65	2	9.2	11.1					
	09/05/88	Dr. mo.	300	1	42.0	5.6					
	09/05/88	Ox. he.	55	2	7.7	11.1					
	09/05/88	Pa. co.	11	1	1.5	5.6					
	09/05/88	St. la.	9	1	1.2	5.6					
	09/05/88	Ze. ka.	23	2	3.2	11.1					
		TOTAL	715	18							
Kambagora	09/05/88	Ch. fa.	499	187	14.1	40.7	11257	4223	12	103	48
	09/05/88	Gl. gj.	2608	139	73.8	30.2	58895	3139	10	206	58
	09/05/88	Me. af.	419	110	11.9	23.9	9470	2484	11	129	38
	09/05/88	Mo. ne.	6	12	0.2	2.6	145	271	26	40	31
	09/05/88	Ox. fi.	3	12	0.1	2.6	61	271	17	34	22
			TOTAL	3535	460			79829	10387		
Sunjim	09/05/88	An. bi.	315	26	5.6	3.8	6155	507	250	562	401
	09/05/88	Ar. ve.	94	7	1.7	1.0	1831	137	46	230	117
	09/05/88	Ch. cr.	590	172	10.5	25.0	11509	3357	18	98	55
	09/05/88	Ch. fa.	752	180	13.4	26.2	14678	3513	14	102	60
	09/05/88	Gg. l7.	11	26	0.2	3.8	224	507			
	09/05/88	Gl. gj.	1258	112	22.4	16.3	24548	2186	22	157	61
	09/05/88	He. tr.	470	52	8.4	7.6	9179	1015	25	101	62
	09/05/88	Me. af.	144	31	2.6	4.5	2806	605	17	102	58
	09/05/88	Mo. ne.	1	2	0.0	0.3	10	39			
	09/05/88	Me. gc.	133	5	2.4	0.7	2605	98	49	207	103
	09/05/88	Dr. mo.	919	17	16.4	2.5	17943	332	78	182	121
	09/05/88	Pa. co.	319	28	5.7	4.1	6218	546			
	09/05/88	St. la.	43	1	0.8	0.1	835	20			
	09/05/88	Ze. ka.	573	29	10.2	4.2	11177	566	119	207	157

RIVER	DATE	SPECIES	WEIGHT		NUMBER		PER_HT	PER_NUM	BIOMASS	DENSITY	MIN_LEN	MAX_LEN	AVG_LEN
			5622	688									
Hohoma	09/06/88	An.bi.	948	2	33.5	0.4					502	592	547
	09/06/88	Ch.cr.	231	149	8.2	30.8							
	09/06/88	Ch.fa.	124	22	4.4	4.6							
	09/06/88	Gg.l8.	19	36	0.7	7.5							
	09/06/88	Gl.gj.	694	166	24.5	34.4					19	21	20
	09/06/88	He.tr.	288	27	10.2	5.6							
	09/06/88	Ne.gc.	57	9	2.0	1.9							
	09/06/88	Or.mo.	466	72	16.5	14.9					14	160	32
		TOTAL	2826	483									
Mihambaun	09/07/88	An.bi.	195	1	2.1	0.0	1728	9	433	433	433		
	09/07/88	Ch.cr.	5358	1727	56.3	52.4	47376	15270	44	105	67		
	09/07/88	Ch.fa.	1223	251	12.8	7.6	10817	2219					
	09/07/88	Gg.bu.	168	270	1.8	8.2	1489	2387					
	09/07/88	Gl.gj.	515	203	5.4	6.2	4551	1795	16	84	50		
	09/07/88	He.tr.	1877	228	19.7	6.9	16598	2016	28	99	67		
	09/07/88	Mel.j.	60	569	0.6	17.3	527	5031					
	09/07/88	Me.af.	5	8	0.1	0.2	43	71	26	47	36		
	09/07/88	Mo.ne.	1	1	0.0	0.0	5	9					
	09/07/88	Ne.gc.	92	28	1.0	0.8	815	248	26	99	65		
	09/07/88	Ne.id.	14	4	0.1	0.1	121	35					
	09/07/88	Ox.fi.	16	7	0.2	0.2	141	62					
			TOTAL	9524	3297			84210	29151				
Biahin	09/08/88	An.bi.	537	3	31.8	0.8	6542	37	262	546	370		
	09/08/88	Ch.cr.	182	97	10.8	26.9	2220	1182	39	90	59		
	09/08/88	Ch.fa.	258	29	15.3	8.0	3145	353	21	84	31		
	09/08/88	Gg.l8.	12	14	0.7	3.9	145	171	16	53	31		
	09/08/88	Gl.gj.	4	2	0.2	0.6	43	24	12	144	56		
	09/08/88	He.tr.	473	33	28.1	9.1	5768	402	29	112	77		
	09/08/88	Mel.j.	11	177	0.7	49.0	139	2157					
	09/08/88	Me.af.	1	1	0.0	0.3	7	12					32
	09/08/88	Ne.gc.	209	5	12.4	1.4	2545	61	148	169	162		
		TOTAL	1686	361			20554	4400					
Malas	10/22/88	Ch.cr.	31	11	1.8	4.3	453	162	35	90	54		
	10/22/88	Ch.fa.	192	55	11.2	21.7	2821	809	21	93	58		
	10/22/88	Gl.gj.	486	45	28.5	17.8	7146	662	33	120	65		
	10/22/88	He.tr.	132	9	7.8	3.6	1948	132					
	10/22/88	Me.af.	371	81	21.7	32.0	5449	1191	15	104	55		
	10/22/88	Mo.bl.	0	0	0.0	0.0	0	0					
	10/22/88	Mo.sp.	13	40	0.8	15.8	189	588					
	10/22/88	Or.mo.	471	7	27.6	2.8	6929	103	36	163	106		
		TOTAL	1707	253			25100	3721					
Kambagora	11/01/88	Ch.fa.	164	130	9.7	27.2	3713	2936	2	100	34		
	11/01/88	Gl.gj.	1093	91	64.4	19.0	24682	2055	18	143	55		
	11/01/88	Me.af.	190	191	11.2	40.0	4301	4313	11	127	24		
	11/01/88	Mo.ne.	11	17	0.7	3.6	250	384					
	11/01/88	Ox.fi.	239	49	14.1	10.3	5405	1106	13	164	32		
		TOTAL	1698	478			38352	10794					

RIVER	DATE	SPECIES	WEIGHT	NUMBER	PER_WT	PER_NUM	BIO MASS	DENSITY	MIN_LEN	MAX_LEN	AVG_LEN
Saramandi	11/01/88	An.bi.	271	5	11.2	0.6	6951	128	205	392	275
	11/01/88	Ch.fa.	649	214	26.8	26.7	16676	5496	12	94	49
	11/01/88	Gl.gj.	665	160	27.4	20.0	17080	4109	26	84	56
	11/01/88	Mel.j.	2	50	0.1	6.2	46	1284			
	11/01/88	Me.af.	392	320	16.2	39.9	10058	8218	13	104	33
	11/01/88	Mo.ne.	15	24	0.6	3.0	393	616			
	11/01/88	Op.ap.	138	7	5.7	0.9	3544	180	64	145	96
	11/01/88	Or.mo.	290	18	12.0	2.2	7444	462	43	127	63
	11/01/88	Ox.fi.	1	4	0.0	0.5	31	103			
		TOTAL	2423	802			62221	20596			
Munjia	11/02/88	An.bi.	45	2	1.8	0.9	763	34	267	493	380
	11/02/88	Ar.ve.	1576	74	62.6	32.2	26637	1251	45	195	89
	11/02/88	Ch.cr.	226	54	9.0	23.5	3826	913	19	100	58
	11/02/88	Ch.fa.	56	15	2.2	6.5	946	254	20	94	52
	11/02/88	Gg.17.	2	3	0.1	1.3	32	51			
	11/02/88	Gl.gj.	309	39	12.3	17.0	5216	659	25	108	56
	11/02/88	He.tr.	126	31	5.0	13.5	2123	524	25	88	48
	11/02/88	Or.mo.	58	1	2.3	0.4	982	17			
	11/02/88	Pa.co.	49	4	1.9	1.7	821	68			
	11/02/88	St.sp.	7	1	0.3	0.4	121	17			
	11/02/88	Ze.ka.	63	6	2.5	2.6	1067	101	73	151	134
		TOTAL	2516	230			42532	3888			
Mihambaum	11/08/88	Ch.cr.	6832	1745	59.3	47.3	60408	15429	36	104	65
	11/08/88	Ch.fa.	1278	180	11.1	4.9	11297	1592	35	100	67
	11/08/88	Gg.bu.	163	420	1.4	11.4	1442	3714			
	11/08/88	Gl.gj.	814	212	7.1	5.7	7193	1874	29	110	59
	11/08/88	He.tr.	2092	258	18.2	7.0	18493	2281	25	112	63
	11/08/88	Mel.j.	215	843	1.9	22.8	1899	7454			
	11/08/88	Me.af.	4	5	0.0	0.1	37	44	34	42	38
	11/08/88	Me.gc.	102	20	0.9	0.5	903	177	41	127	69
	11/08/88	Me.id.	11	4	0.1	0.1	100	35	33	73	56
	11/08/88	Ox.fi.	3	5	0.0	0.1	30	44			
		TOTAL	11514	3692			101803	32644			
Biahin	11/09/88	An.bi.	430	4	9.3	0.4	6096	57			
	11/09/88	Chi.j.	7	131	0.1	11.7	99	1855			
	11/09/88	Ch.cr.	956	354	20.5	31.6	13538	5014	32	107	57
	11/09/88	Ch.fa.	126	134	2.7	12.0	1782	1898	26	78	45
	11/09/88	Gg.18.	129	293	2.8	26.2	1821	4150	14	48	29
	11/09/88	Gl.gj.	1788	118	38.4	10.5	25323	1671	31	145	74
	11/09/88	He.tr.	715	60	15.4	5.4	10124	850	37	100	71
	11/09/88	Me.gc.	473	23	10.2	2.1	6698	326	108	132	124
	11/09/88	Or.mo.	29	1	0.6	0.1	411	14	76	91	84
	11/09/88	Ox.fi.	1	1	0.0	0.1	10	14			33
		TOTAL	4653	1119			65902	15849			
Ofri	11/17/88	Ar.ve.	79	3	4.7	2.2	1439	54			
	11/17/88	Ch.fa.	7	37	0.4	27.6	134	671			
	11/17/88	Cy.ca.	422	1	24.8	0.7	7650	18			
	11/17/88	Gg.bu.	8	5	0.5	3.7	150	91			
	11/17/88	Gl.gj.	66	28	3.9	20.9	1192	508			
	11/17/88	He.tr.	32	16	1.8	11.9	571	290	27	81	44
	11/17/88	Or.mo.	1090	44	63.9	32.8	19752	798	30	151	74

RIVER	DATE	SPECIES	WEIGHT		PER_WT	PER_NUM	BIOMASS	DENSITY	MIN_LEN	MAX_LEN	AVG_LEN	
			1704	134								
		TOTAL					30889	2429				
Emmacreek	11/18/88	Ch.ca.	3	8	0.5	5.6	65	159	33	44	39	
	11/18/88	Ch.fa.	96	73	14.7	51.0	1897	1450	11	84	42	
	11/18/88	Cy.ca.	56	1	8.7	0.7	1120	20				
	11/18/88	Ga.sp.	0	2	0.0	1.4	5	40				
	11/18/88	Gg.ko.	1	1	0.2	0.7	26	20			46	
	11/18/88	Gl.gj.	345	22	53.1	15.4	6852	437	9	162	79	
	11/18/88	Gp.ma.	5	10	0.7	7.0	96	199	21	41	30	
	11/18/88	He.af.	11	14	1.8	9.8	226	278	21	56	35	
	11/18/88	Mo.bl.	1	1	0.1	0.7	16	20				
	11/18/88	Mo.ne.	4	7	0.6	4.9	74	139				
	11/18/88	Op.ap.	126	3	19.4	2.1	2503	60	75	159	108	
	11/18/88	Pa.co.	1	1	0.1	0.7	13	20				
			TOTAL	649	143			12892	2841			
Mattewcreek	11/19/88	Ch.bu.	42	13	3.7	4.7	2734	852	27	78	54	
	11/19/88	Ch.ca.	21	13	1.9	4.7	1380	852	25	68	40	
	11/19/88	Ch.fa.	373	94	33.1	33.7	24442	6164	22	103	59	
	11/19/88	Gl.gj.	524	26	46.6	9.3	34388	1705	22	118	78	
	11/19/88	Gp.ma.	13	12	1.1	4.3	827	787	23	69	38	
	11/19/88	Hel.j.	11	81	0.9	29.0	692	5311				
	11/19/88	He.af.	26	32	2.3	11.5	1718	2098	18	57	33	
	11/19/88	Mo.ne.	1	4	0.1	1.4	97	262	19	82	37	
	11/19/88	He.ni.	46	2	4.1	0.7	3047	131				
	11/19/88	Ox.he.	67	2	6.0	0.7	4415	131				
			TOTAL	1125	279			73739	18295			
Aleacreek	11/21/88	Ch.bu.	10	5	1.4	2.6	572	283				
	11/21/88	Ch.fa.	52	43	7.1	22.3	2919	2436	25	80	42	
	11/21/88	Gl.gj.	307	19	42.4	9.8	17382	1076				
	11/21/88	Gp.ma.	10	22	1.4	11.4	584	1246	23	39	31	
	11/21/88	He.tr.	1	1	0.1	0.5	36	57				
	11/21/88	Hel.j.	2	27	0.3	14.0	125	1529				
	11/21/88	He.af.	28	27	3.8	14.0	1579	1529	23	45	38	
	11/21/88	Mo.ne.	12	36	1.7	18.7	703	2039	20	37	27	
	11/21/88	Op.ap.	168	3	23.3	1.6	9542	170				
	11/21/88	Dr.mo.	14	6	2.0	3.1	819	340				
	11/21/88	Ox.he.	120	4	16.5	2.1	6774	227				
			TOTAL	724	193			41035	10932			
	Aleacreek	11/21/88	An.bi.	287	1	24.9	4.2			519	519	519
11/21/88		Ch.bu.	1	1	0.1	4.2						
11/21/88		Ch.ca.	1	3	0.1	12.5						
11/21/88		Ch.fa.	4	4	0.4	16.7						
11/21/88		Gl.gj.	11	1	1.0	4.2						
11/21/88		Gp.ma.	2	3	0.2	12.5						
11/21/88		Mo.ne.	2	4	0.2	16.7						
11/21/88		Op.ap.	8	1	0.7	4.2						
11/21/88		Dr.mo.	779	4	67.6	16.7			113	207	168	
11/21/88		Ze.ka.	58	2	5.0	8.3			174	182	178	
		TOTAL	1152	24								
Eejt	12/13/88		657	156	50.0	50.0						
	12/13/88	An.bi.	93	2	7.1	0.6			230	322	276	

RIVER	DATE	SPECIES	WEIGHT	NUMBER	PER_WT	PER_NUM	BIOMASS	DENSITY	MIN_LEN	MAX_LEN	AVG_LEN
	12/13/88	Ch.cr.	30	26	2.3	8.3			34	66	49
	12/13/88	Ch.fa.	42	42	3.2	13.5					
	12/13/88	Gg.01.	4	1	0.3	0.3					
	12/13/88	Gg.02.	2	1	0.1	0.3					
	12/13/88	Gg.18.	6	11	0.5	3.5					
	12/13/88	Gl.gj.	294	28	22.4	9.0					
	12/13/88	Gp.sp.	19	15	1.5	4.8					
	12/13/88	He.tr.	140	23	10.6	7.4		39	93	59	
	12/13/88	He.af.	2	4	0.2	1.3					
	12/13/88	Mo.ne.	0	1	0.0	0.3					
	12/13/88	Op.ap.	24	1	1.8	0.3					
	12/13/88	Ox.fi.	0	1	0.0	0.3					
	12/13/88	Ze.ka.	0	0	0.0	0.0					
		TOTAL	1314	312							
inim	12/15/88	Me.af.	89	62	96.3	91.2					
	12/15/88	Mo.bl.	1	1	0.8	1.5					
	12/15/88	Mo.ne.	3	5	2.9	7.4					
		TOTAL	92	68							
ucreek	12/15/88	Me.af.	395	189	67.5	79.4	15242	7287	16	84	44
	12/15/88	Mo.bl.	118	21	20.1	8.8	4541	810			
	12/15/88	Mo.ne.	1	3	0.2	1.3	52	116			
	12/15/88	Ox.fi.	71	25	12.1	10.5	2733	964	26	91	47
		TOTAL	585	238			22568	9177			
osengla	12/17/88	Me.af.	7	5	70.8	45.5					
	12/17/88	Mo.ne.	3	6	29.2	54.5					
		TOTAL	10	11							
osengla	12/18/88	He.tr.	16	2	77.3	13.3			65	67	66
	12/18/88	Me.af.	5	13	22.7	86.7					
		TOTAL	21	15							
aramandi	01/09/89	An.bi.	87	4	18.5	1.5			75	281	209
	01/09/89	Ch.fa.			0.0	0.0			11	98	49
	01/09/89	Gl.gj.		83	0.0	31.9			13	96	44
	01/09/89	Me.af.	382	173	81.5	66.5			11	99	40
		TOTAL	468	260							
injin	01/10/89	Ar.ve.	665	61	44.0	45.9			44	154	72
	01/10/89	Gl.gj.	149	16	9.8	12.0			119	85	54
	01/10/89	Or.mo.		2		1.5			117	137	124
	01/10/89	Pa.co.	476	40	31.5	30.1			61	85	74
	01/10/89	Ze.ka.	223	14	14.7	10.5			108	188	150
		TOTAL	1513	133							
inomitem	01/24/89	Ch.cr.	163	50	85.4	94.3	4998	1536	49	90	64
	01/24/89	Mo.bl.	28	3	14.6	5.7	855	92			
		TOTAL	191	53			5853	1628			
ak	01/24/89	Ch.cr.	119	35	94.6	97.2			24	77	44
	01/24/89	Gg.18.	7	1	5.4	2.8					
		TOTAL	126	36							

RIVER	DATE	SPECIES	WEIGHT	NUMBER	PER_MT	PER_NUM	BIOMASS	DENSITY	MIN_LEN	MAX_LEN	AVG_LEN
Nene	01/24/89	Ch.cr.	91	8	15.2	20.5	1959	172	64	99	85
	01/24/89	Gg.18.	109	23	18.1	59.0	2344	495			
	01/24/89	Me.af.	8	2	1.4	5.1	175	43	34	42	38
	01/24/89	Me.gg.	392	6	65.3	15.4	8446	129	131	250	186
		TOTAL	600	39			12925	840			
Frida creek	01/27/89	Ch.cr.	2	2	1.0	10.0					
	01/27/89	Gl.gj.	47	3	25.0	15.0					
	01/27/89	He.tr.	20	1	10.7	5.0					
	01/27/89	Me.af.	5	3	2.5	15.0					
	01/27/89	Pa.co.	114	11	60.7	55.0			67	94	73
	TOTAL	188	20								
Kamasau	02/16/89	Bu.gy.	572	1	12.5	0.1	4135	7			
	02/16/89	Ch.fa.	1718	624	37.6	53.9	12424	4511	18	97	55
	02/16/89	Gg.18.	11	3	0.2	0.3	81	22			
	02/16/89	Gl.gj.	782	48	17.1	4.1	5656	347	16	124	55
	02/16/89	He.tr.	991	211	21.7	18.2	7167	1525	13	101	51
	02/16/89	Me.af.	70	46	1.5	4.0	509	333	24	95	42
	02/16/89	Mo.ne.	51	187	1.1	16.2	367	1352	12	40	25
	02/16/89	Me.gc.	352	21	7.7	1.8	2547	152	49	169	116
	02/16/89	Ox.fi.	19	16	0.4	1.4	137	116	24	49	38
		TOTAL	4568	1157			33023	8365			
Kundino	02/17/89	An.ma.	138	1	100.0	100.0	5155	37			
		TOTAL	138	1			5155	37			
Mihambaum	03/01/89	Ch.cr.	1151	610	66.2	70.1			42	86	60
	03/01/89	Gg.bu.	66	122	3.8	14.0					
	03/01/89	Gl.gj.	135	33	7.8	3.8			42	90	54
	03/01/89	He.tr.	284	79	16.3	9.1			38	83	55
	03/01/89	Ne.gc.	95	19	5.4	2.2			60	119	83
	03/01/89	Ox.fi.	8	7	0.5	0.8					
	TOTAL	1739	870								
Kamasau	08/08/89	Bu.gy.	160	1	3.0	0.1	1081	7			
	08/08/89	Ch.fa.	1689	507	31.8	39.5	11432	3433	13	99	56
	08/08/89	Gg.bu.	1	1	0.0	0.1	9	7	9	32	20
	08/08/89	Gl.gj.	920	84	17.3	6.5	6232	569	10	129	58
	08/08/89	He.tr.	1757	342	33.0	26.7	11897	2316	12	97	51
	08/08/89	Me.af.	25	30	0.5	2.3	170	203	10	74	31
	08/08/89	Mo.ne.	36	215	0.7	16.8	245	1456			
	08/08/89	Ne.gc.	709	43	13.3	3.4	4797	291	44	170	109
	08/08/89	Me.id.	13	1	0.2	0.1	87	7			104
	08/08/89	Ox.fi.	7	59	0.1	4.6	50	399	13	75	38
	TOTAL	5317	1283			36002	8687				
Biabin	08/10/89	An.bi.	399	5	19.6	0.4	3770	47	260	472	311
	08/10/89	Ch.cr.	132	314	6.5	26.9	1249	2967	39	83	60
	08/10/89	Ch.fa.	40	175	2.0	15.0	377	1653	11	76	22
	08/10/89	Gg.18.	47	333	2.3	28.5	440	3146	10	39	20
	08/10/89	Gl.gj.	1002	281	49.2	24.1	9465	2655	11	145	36
	08/10/89	He.tr.	108	15	5.3	1.3	1020	142	27	84	58
	08/10/89	Me.af.	4	8	0.2	0.7	39	76	13	41	28

RIVER	DATE	SPECIES	WEIGHT	NUMBER	PER_WT	PER_NUM	BIOMASS	DENSITY	MIN_LEN	MAX_LEN	AVG_LEN
	08/10/89	Ne.gc.	210	7	10.3	0.6	1986	66	105	181	134
	08/10/89	Ne.id.	62	4	3.0	0.3	587	38	90	115	100
	08/10/89	Ox.fi.	34	24	1.6	2.1	317	227	14	79	31
		TOTAL	2038	1167			19255	11026			
Munjin	08/30/89	An.bi.	54	1	0.7	0.0	438	8	299	299	299
	08/30/89	Ar.ve.	1230	86	15.5	4.0	9955	696	51	129	96
	08/30/89	Ch.cr.	2818	1201	35.4	56.5	22800	9717	13	100	48
	08/30/89	Ch.fa.	389	168	4.9	7.9	3150	1359	13	99	41
	08/30/89	Gg.sp.	50	136	0.6	6.4	407	1100	15	43	27
	08/30/89	Gl.gj.	1357	196	17.1	9.2	10982	1586	16	121	53
	08/30/89	He.tr.	1423	279	17.9	13.1	11512	2257	13	111	57
	08/30/89	Me.af.	37	14	0.5	0.7	302	113	22	106	45
	08/30/89	Mo.ne.	0	1	0.0	0.0	2	8	45	45	45
	08/30/89	Ne.gc.	83	10	1.0	0.5	672	81	33	134	87
	08/30/89	Ne.id.	9	1	0.1	0.0	69	8			94
	08/30/89	Or.mo.	166	9	2.1	0.4	1343	73	18	139	61
	08/30/89	Pa.co.	191	14	2.4	0.7	1549	113	71	85	77
	08/30/89	Ze.ka.	149	8	1.9	0.4	1202	65	149	175	160
		TOTAL	7958	2124			64384	17184			

